

# Gwent Levels Green Infrastructure Strategy

April 2017

The Living Levels Landscape Partnership  
**Gwent Levels  
Green Infrastructure Strategy**

Approved

A handwritten signature in black ink, appearing to read 'D. Watkins', enclosed within a large, loopy circular flourish.

Dominic Watkins

Position

Director

Date

24th April 2017

Revision

FINAL

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## 1.0 INTRODUCTION

### 1.1 Background

#### Context

1.1.1 This Green Infrastructure (GI) Strategy for the Gwent Levels was commissioned in 2016 by Monmouthshire County Council as part of the suite of documents required to support a bid for the Heritage Lottery Fund's Landscape Partnership programme, which provides grants for schemes aiming to conserve areas of distinctive landscape character. The GI Strategy was prepared by Chris Blandford Associates (CBA).

1.1.2 The 'Living Levels' Landscape Partnership Scheme aims to bring together local stakeholders, communities and farmers to collectively restore, enhance and protect the Gwent Levels landscape for all to enjoy. The partners are: the Royal Society for the Protection of Birds, Gwent Wildlife Trust, Natural Resources Wales (NRW), Monmouthshire County Council, Newport City Council, Cardiff City Council, Cardiff Story Museum, Sustrans, The National Trust, Bumblebee Conservation Trust and Buglife.

#### Aims and Objectives

1.1.3 The aim of the GI Strategy is to help inform the positive management of GI within the Gwent Levels for the benefit of local communities and wildlife. The objectives of the GI Strategy are twofold:

- To identify and map existing GI assets, assess the ecosystem services or benefits that these assets provide and to identify needs and opportunities for improving the area's GI assets.
- To develop an overarching long-term vision, principles and framework for the planning and delivery of GI through the Living Levels Landscape Partnership Scheme.

1.1.4 The GI Strategy has been informed by, and should be read in conjunction with, the Gwent Levels Landscape Character Assessment prepared by CBA and the Living Levels Destination Management Plan prepared by Cole & Shaw. Together, these documents will be used to inform the Living Levels Landscape Conservation Action Plan for delivery of projects funded by the HLF. The GI Strategy was also informed by feedback from local stakeholder workshops held in 2016, and consultation with the projects' partners.



## Study Area

1.1.5 The Living Levels Landscape Partnership Area (the study area) is shown on **Figure 1.1**. See the Gwent Levels Landscape Character Assessment for details. It falls within three different local authority areas in south-east Wales: Monmouthshire County Council; Newport City Council; and Cardiff City Council.

1.1.6 The majority of the study area is dominated by the extensive flat, low-lying area of largely undeveloped agricultural land, small villages and isolated farmsteads, extending from Cardiff and the River Rhymney in the west to Chepstow on the River Wye in Monmouthshire to the east. It comprises three discrete areas of reclaimed estuarine alluvium that collectively form a coastal plain up to 6km wide behind the sea wall:

- Wentlooge Level, which extends from Cardiff and the River Rhymney to the mouth of the River Usk south of Newport.
- Caldicot Level), which extends between the River Usk and the bedrock promontory at Sudbrook in Monmouthshire.
- Mathern Level, a small area between Sudbrook and the River Wye in Monmouthshire.

1.1.7 The study area also includes the inter-tidal zone of saltmarshes, mudflats and sands exposed at low tide beyond the sea wall, which was once land before sea level rises. It also includes the town of Chepstow and the Severnside settlements in Monmouthshire (Caldicot, Rogiet and Magor/Undy); the southern and eastern edge of the City of Newport; and the eastern edge of the City of Cardiff.

## 1.2 What is Green Infrastructure?

- 1.2.1 The following definition of GI is based on the Monmouthshire GI SPG (2015)<sup>1</sup>:

### **Green Infrastructure (GI)**

- 1.2.2 GI is the multi-functional network of natural and semi-natural features, green and blue spaces and corridors, and footpaths/cycleways, which 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 to the effects of climate change.

## **GI Assets**

- 1.2.3 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.

## **GI Functions and Ecosystem Services**

- 1.2.4 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.
- 1.2.5 Underpinning the multiple functions that GI assets perform is the concept of ecosystem services. Ecosystem services are defined as the benefits provided by GI that contribute to making life both possible and worth living (e.g. clean air, water, food and materials). They include:
- **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).

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<sup>1</sup> Monmouthshire County Council, 2015, Green Infrastructure Supplementary Planning Guidance, Adopted April 2015, Chris Blandford Associates

- **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).

1.2.6 Further information is set out in the National Assembly for Wales' *Ecosystems and the Ecosystems Approach: a Quick Guide*<sup>2</sup>. 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.

1.2.7 GI approaches to natural resource management recognise that natural or semi-natural systems can provide services with equivalent or similar benefits to conventional "grey" infrastructure. Furthermore, GI approaches can be used to help restore and reconnect fragmented landscapes to create stronger and more resilient ecological networks.

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<sup>2</sup> National Assembly of Wales (2012). *Ecosystems and the Ecosystem Approach: A Quick Guide*.

## GI Connectivity

- 1.2.8 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 multi-functional GI networks and connections that apply at all spatial scales.

## GI Benefits

- 1.2.9 A GI approach enables landscapes to deliver a wide range of 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. For example, the connectivity of footpaths and cycleways often coincide with green corridors, providing opportunities for people to gain health and well-being benefits from active recreation while experiencing nature and the landscape.

## 1.3 Structure of the Strategy

- 1.3.1 The GI Strategy comprises the following chapters:

- **Existing Green Infrastructure Assets (Chapter 2.0)** – this chapter identifies and maps the existing GI assets within the study area.
- **Ecosystem Services (Chapter 3.0)** – this chapter assesses the ecosystem services provided by the GI assets within the study area.
- **Green Infrastructure Opportunities (Chapter 4.0)** – this chapter identifies opportunities for improving the area’s GI assets.
- **Green Infrastructure Strategy (Chapter 5.0)** – set within the national and local GI policy context, the final chapter provides an overarching long-term vision, principles and framework for the planning and delivery of GI through the Living Levels Landscape Partnership scheme.

## 1.4 Acknowledgements

1.4.1 We would like to acknowledge the support of all the stakeholders who attended workshops, provided information and commented on drafts of this report. Thank you in particular to the GIS managers at the RSPB, Natural Resources Wales, Glamorgan-Gwent Archaeological Trust, Monmouthshire County Council, Newport City Council and Cardiff City Council for supplying the GIS data for the project.

1.4.2 CBA would also particularly like to thank the three members of the Working Group for their generous help and support throughout this project:

- Colette Bosley – Principal Landscape and Countryside Officer at Monmouthshire County Council
- Matthew Lewis – Green Infrastructure and Countryside Manager at Monmouthshire County Council
- Alison Boyes – Living Levels Programme Development Manager

1.4.3 The CBA Team comprised:

- Dominic Watkins – Project Director
- Ruth Childs – Project Manager
- Bill Wadsworth – Biodiversity/Green Infrastructure Advisor
- Harriet Stanford – GIS Mapping/Researcher
- Georgia Mackie – Researcher

## 2.0 EXISTING GREEN INFRASTRUCTURE ASSETS

### 2.1 Overview

2.1.1 The GI assets found within the study area today are a product of the physical and human influences on the formation of the Gwent Levels, which are described in Section 2.0 of the Gwent Levels Landscape Character Assessment under the following LANDMAP aspect areas:

- **Geological Landscape** – the physical expression of the underlying geology, topography/landforms and fluvial or coastal processes that fundamentally shape the landscape.
- **Historic Landscape** – the prominent historic land uses, patterns and features that contribute to the overall historic character of the contemporary landscape.
- **Cultural Landscape** – the fundamental way in which cultural or human activity shapes the landscape, and the way in which culture shapes the way people think about landscape.
- **Landscape Habitats** – the semi-natural habitats that influence landscape and biological diversity, land cover and the way that the land is used and enjoyed at a broad landscape-scale.

- **Visual and Sensory** – the spatial (scale, pattern, colour and texture) and experiential (sense of remoteness and tranquillity) aspects that influence how people perceive the landscape.

2.1.2 The historic Gwent Levels related to a once more extensive tract of agricultural land initially reclaimed and drained in the Roman period, and managed under the jurisdiction of the Commissioners of Sewers for Monmouthshire from the early 17th Century. Today, the significance of the surviving undeveloped parts of the Gwent Levels is recognised as being a Historic Landscape of Outstanding Historic Interest by its inclusion on the Register of Landscapes, Parks and Gardens of Outstanding Historic Interest in Wales. This acknowledges that the Gwent Levels is an outstanding and unique 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. The present landscape depends for its survival upon a number of integrated features:

- **Seawalls** – forming continuous barriers between the major tidal rivers. The present line may date from the 16th century but they have constantly been improved and strengthened. Some abandoned sea banks survive inland.

- **Major rivers** (known in the past as pills) – natural watercourses canalised across the Levels to stop them flooding the farmland. They discharge through the seawalls by tidal flaps or gouts into tidal channels now called pills.
- **Reens** – large artificial ditches which need regular maintenance to ensure the free flow of water. Their height can be controlled by weirs or stanks. Reen water is discharged through the gouts.
- **Field ditches** – these surround every field and provide distinctive patterns in different parts of the Levels. These ditches are maintained on longer cycles than the reens and are the responsibility of the landowners, and drain into the reens.
- **Grips** – rectangular patterns of shallow ditches on the field surface to speed the drainage of rain water. They discharge into the field ditches.
- **Transport network** – within the Levels is a transport system of linear commons, roads, causeways and bridges which originally allowed for the movement of livestock but now provides the network of roads, bridleways and footpaths.

2.1.3 Today, the Gwent Levels is home to a rich assemblage of wildlife. The exceptionally high productivity of the alluvial soils has been a catalyst for on-going investment in drainage and agricultural improvement within the Levels since Roman times.

2.1.4 As described in **Appendix A**, the majority of the study area is designated as being of European, national and local nature conservation importance and value. The primary wildlife interest of the Gwent Levels is found within the extensive system of reens and ditches, which have become valuable remnant wetland habitats providing a refuge for rare and endangered wetland species. As a result, the diversity of habitats and the wide range of ecological niches are dependent on sustaining the traditional management of the reen and ditch system. Much of the Gwent Levels is covered by six nationally designated Sites of Special Scientific Interest (SSSI) predominantly designated for their reen and ditch habitats that support a diverse community of aquatic and terrestrial plants and invertebrates, which in turn support a wide range of protected species including otter, water vole, grass snake and amphibians. The inter-tidal habitats of the Severn Estuary and the riparian habitats of the Rivers Wye, Usk and Rhymney are also important areas for biodiversity within the study area.

2.1.5 The designated sites and nature reserves form the core of the ecological network of wetland habitats that is crucial for the survival of many rare and endangered flora and fauna species. The ditches, wetlands and inter-tidal habitats are highly significant ecosystems, and together these form an essential component of the range of ecosystem services provided for Gwent Levels as a whole.

2.1.6 While accessible GI assets within the Gwent Levels are relatively limited and isolated, they are generally well-connected by the network of public rights of way that typically follow the reens and ditches. The area's footpaths and cycleways provide important opportunities for encouraging active outdoor recreation and contributing to health and well-being objectives.

2.1.7 The following GI asset types have been identified within the study area as illustrated on **Figure 2.1** and summarised briefly below:

- Natural and Semi-Natural Greenspaces;
- Blue and Green Corridors;
- Farmland, Orchards and Allotments;
- Cemeteries and Churchyards;
- Parks and Gardens;
- Amenity Greenspaces; and,
- Heritage Sites.

## 2.2 Natural and Semi-Natural Greenspaces

2.2.1 Natural and semi-natural greenspaces encompass a broad range of habitat types that can be found both within and outside of designated sites and nature reserves, such as the foreshore of the estuary beyond the sea wall; reedbeds; wet meadows, grazing marsh, woodlands and dry grasslands; and previously developed/brownfield land.

2.2.2 In addition to supporting a range of habitats for wildlife, these natural and semi-natural greenspaces can also provide managed access for informal recreation (such as walking and bird watching at Newport Wetlands, Great Traston Meadows and Magor Marsh nature reserves, which are partially accessible).

## 2.3 Green and Blue Corridors

2.3.1 Green and blue corridors are predominantly linear landscape features encompassing semi-natural and natural terrestrial and aquatic habitats. In addition to their vital function in supporting the dispersal of wildlife between natural and semi-natural greenspaces within the agricultural landscape and urban areas, these corridors can also provide opportunities for walking, cycling and other outdoor recreation activities where these functions coincide. Within the study area, significant green and blue corridors include:

- The ditch and reen network (important green/blue corridors incorporating public access in some places)
- The Rivers Rhymney, Usk/Ebbe and Wye (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 (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 (important green corridors)



## **2.4 Farmland, Orchards and Allotments**

- 2.4.1 Farmland, orchards and allotments can contribute to local food production and landscape character. Within the study area, farmland includes both commercial farming businesses and small holdings. Historically, orchards were a distinctive feature of the landscape found alongside most farms and the Gwent Levels orchards produced their own specific apple and pear varieties. However, the end of cider making locally means that most orchards are no longer commercially viable and they are now limited to a few sites in the vicinity of Goldcliff, Redwick and Magor on Caldicot Level, plus a small number on Wentlooge Level. Although not depicted on **Figure 2.1**, there are a number of allotments within the study area such as the 'Grow Your Own' scheme at Castleton and a few community gardens.

## **2.5 Cemeteries and Churchyards**

- 2.5.1 In addition to providing important habitats for wildlife, cemeteries and churchyards can also provide opportunities for quiet reflection and spiritual enrichment that contribute to people's well-being. Examples within the study area include urban cemeteries, churchyards associated with small rural parish churches (such as those at Peterstone Wentlooge, Nash, Whiston and Redwick, and cemeteries and churchyards on the edge of larger conurbations such as Rogiet and Portskewett.

## **2.6 Parks and Gardens**

- 2.6.1 Public parks and gardens provide opportunities for informal recreation that can contribute to people's health and well-being, and also provide habitats for wildlife. Within the study area, there are a number of urban parks in east Cardiff (Parc Coed y Nant, Parc Coed y Cwar, Parc Tredelerch and Fishpond Wood) and in Newport. The study area also includes Tredegar House Country Park and Caldicot Castle Country Park.

## **2.7 Amenity Greenspaces**

- 2.7.1 Amenity greenspaces 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 Newport International Sports Village), and a range of more informal amenity greenspaces in urban areas such as those associated with the Severnside settlements.

## **2.8 Heritage Sites**

- 2.8.1 Heritage sites provide opportunities for informal recreation and intellectual access to history that contributes to people's health and well-being. Examples within the study area include historic estates such as Tredegar House and Llanwern Park, and historic monuments such as Caldicot Castle.

## 3.0 ECOSYSTEM SERVICES

### 3.1 General

- 3.1.1 The GI assets identified within the study area (see Chapter 2.0) provide a wide range of benefits to society derived from the functions or ecosystems services that they provide.
- 3.1.2 A summary of the ecosystem services provided by the GI assets within the study area is described below. These form the basis for identifying needs and opportunities for the GI Strategy.

## 3.2 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.

- 3.2.1 **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 **Figures 3.1** and **3.2**). 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 (see **Figure 3.4**).

3.2.2 **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 relationship is illustrated in **Figure 3.3** and **Figure 3.11**). 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 (**Figure 3.5**).

3.2.3 **Pollination:** by insects also provides a supporting service for primary production to support both agricultural production (**Figure 3.11**) and nature conservation (**Figure 3.5**). 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<sup>3</sup> and the creation of initiatives such as B-Lines<sup>4</sup> to promote landscape-scale habitat creation to try and reverse the decline in pollinating insects.

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<sup>3</sup> Defra (November 2014). The National Pollinator Strategy: for bees and other pollinators in England.

<sup>4</sup> <https://www.buglife.org.uk/campaigns-and-our-work/habitat-projects/b-lines>

### 3.3 Provisioning Services

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

3.3.1 **Water availability:** The Gwent Levels is largely a rain-fed system, with relatively limited inputs from the area's rivers (**Figure 3.3**), with the exception of the Wentlooge Level where a reasonably large amount of water is drawn onto the Level from the River Ebbw. 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.

3.3.2 **Food provision:** The area primarily produces beef, milk and other dairy products, with some sheep flocks and arable production (**Figure 3.11**). 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.

3.3.3 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.

3.3.4 **Biomass energy:** 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.

## 3.4 Regulating Services

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

3.4.1 **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 (**Figures 3.1, 3.2 and 3.4**).

3.4.2 **Regulating water quality:** The Gwent Levels, and the rivers that drain through it, fall within the Severn River Basin District (**Figure 3.3**). The 2015 River Basin Management Plan<sup>5</sup> identifies a range of factors that are detrimental to water quality and biodiversity within the study area:

- Diffuse pollution from agriculture and rural land management in general, diffuse pollution from urban areas, misconnections, development pressure in the River Usk catchment<sup>6</sup>;

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<sup>5</sup> 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.

<sup>6</sup> Natural Resources Wales (undated). Usk Management Catchment Summary

- Urban modifications and land drainage on the Wentlooge Level adjacent to the Severn estuary. Due to the heavily populated areas there is pressure from urban diffuse pollution, sewage and misconnections in the South East Valleys catchment, including the River Rhymney<sup>7</sup>;
- Phosphate loads and poor soil management (leading to excessive overland flow/sediment loss to water) in the River Wye catchment<sup>8</sup>.

3.4.3 Point source pollution from development and industry is also an influence on water quality within the study area. The water quality within the ditch and reen system of the Gwent Levels (**Figure 3.3**) 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 to 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.

3.4.4 **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. The seawall (**Figure 3.8**), in combination with the maintenance of the ditch and reen network, is the primary means for regulating flows and preventing flooding, maintaining agricultural productivity and protecting the ecological interest of the Gwent Levels. Local Plan policies provide specific requirements for surface water drainage relating to the management of surface water runoff from development, to manage flood risk<sup>9</sup>.

3.4.5 **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, the 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.

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<sup>7</sup> Natural Resources Wales (undated). South East Valleys Management Catchment Summary.

<sup>8</sup> 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.

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<sup>9</sup> ARUP (October 2014). Local Flood Risk Management Strategy. For and on behalf Newport City Council.

**3.4.6 Regulating coastal processes:** The Gwent Levels comprise c.111km<sup>2</sup> of reclaimed estuarine alluvium, forming a coastal plain up to 6km 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 (**Figure 3.8**), 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'<sup>10</sup>

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<sup>10</sup> 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.

## 3.5 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.

**3.5.1 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.

3.5.2 **Sense of history:** The Gwent Levels is a Historic Landscape of Outstanding Historic Interest (**Figure 3.7**). It is a landscape of extraordinarily diverse environmental and archaeological potential (**Figure 3.6**). 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.

3.5.3 **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 (**Figure 3.12**). Facilities and destinations include promoted recreational routes (such as the Wales Coast Path, Sirhowy Valley Walk and the Rhymney River Walk); country parks (Caldicot Castle and Tredegar House); nature reserves (Newport Wetlands, Magor Marsh, Great Traston Meadows and Peterstone Wentlooge Marshes); villages (such as Redwick and Peterstone); Hendre Lake near St Mellons; and the Transporter Bridge (a distinctive landmark, visitor attraction and crossing point for users of the Wales Coast Path). Angling, particularly off the seawall, is a common activity, as is cycle training (linked to the velodrome in the Newport International Sports Village on the edge of the Levels). Wildfowling is also active on the Levels.



## **4.0 GREEN INFRASTRUCTURE OPPORTUNITIES**

### **4.1 Overview**

4.1.1 This Chapter explores opportunities for improving GI within the study area. The opportunities have been identified through stakeholder consultation workshops and through analysis of the ecosystem services described in **Section 3.0**.

4.1.2 The following themes have been identified for consideration of GI opportunities within the study area:

- Water Management;
- Sustainable Farming;
- Estuarine Processes; and,
- Access and Recreation.

4.1.3 This section should be read in conjunction with the detailed opportunities for strengthening and enhancing the character of individual landscape character areas identified in Section 3.0 of the Gwent Levels Landscape Character Assessment.

## **4.2 Water Management**

4.2.1 The extensive network of field drainage ditches and reens are one of the most distinctive landscape features of the Gwent Levels (see **Figure 3.3**), and are also of high biodiversity value.

4.2.2 Until recently, the Caldicot and Wentlooge Internal Drainage Board was responsible for maintaining the system of reens and ditches. The Caldicot and Wentlooge Internal Drainage Board's responsibilities were transferred to NRW in 2015. NRW is now responsible for maintaining the c.64 km of main reens and c.137km of lesser reens within the new Caldicot and Wentlooge Internal Drainage District that covers the Gwent Levels. In addition, NRW maintain the main rivers - the embanked natural watercourses, such as Monksditch and Elver Pill Reen, whose banks are raised during periodic cleaning. The remaining c.1200km of field ditches that criss-cross the Levels are maintained and funded by individual landowners.

4.2.3 The conservation value of these watercourses is vulnerable to neglect through lack of appropriate maintenance, changes in drainage and land use. There is a fundamental need to manage water and the network of watercourses within the Gwent Levels. This includes management of water control infrastructure and wetland habitats across the Levels. This is essential for maximising GI benefits such as improved flood management, water and soil

quality; viable agricultural futures; protection of buried archaeology; and to increase the range and extent of habitats and species and their resilience to climate change.

#### 4.2.4 Opportunities for addressing these needs could include:

- **Developing a landscape-scale approach to wetland management** in general and in particular, maintaining and restoring a functioning ditch and reen system (**Figure 3.3**). Multiple benefits that may accrue through a landscape-scale approach could include: managing aquatic and marginal vegetation to maintain the function and conservation interest of ditches and reens (such as for aquatic plants and invertebrates, birds reliant on wetland habitats and water voles) in appropriate locations compatible with flood risk management objectives (**Figure 3.3** and **3.5**); the maintenance of a healthy, productive, farmland landscape (**Figure 3.11**); and the control and management of flood risk. Careful consideration should also be given to the manner in which essential ditch maintenance is carried out using large machinery to protect species such as water vole. A well-maintained ditch network may also reduce the frequency or volume of water needing to be pumped off the Levels, which has benefits in terms of both the maintenance of machinery and CO<sub>2</sub> emissions.

- **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.
- **Maintaining and restoring water management infrastructure** – pumps, sluices and other control mechanisms, ditches, reens, drains and grips – 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.

- **Mapping and quantifying ecosystem services** at a holding scale, particularly in the lowest-lying parts of the area, to identify and stimulate initiatives that release land from agriculture in exchange for other benefits, principally biodiversity through the expansion of wetland habitats such as fen, bog, swamp and reedbed, water regulation, protection of heritage assets and provision of access and recreation.
- **Restoring over-drained or damaged wet grasslands**, and reinstating traditional water management techniques and groundwater levels, where appropriate.
- **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 (**Figure 3.13**), and the abandonment of traditional channel management practices.
- **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.
- **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<sup>11</sup>. Other initiatives include the management of pressures from urban diffuse pollution, including misconnections and sewage discharges; implementation of best design guidance to manage urban modifications and land drainage on Wentlooge Level adjacent to the Severn estuary; promotion of access, tourism and recreation for urban communities; and, conservation of biodiversity<sup>12</sup>. In addition, initiatives also include the delivery of the Wye nutrient management plan objectives; working with farmers resolve soil structure issues and degraded riparian habitat; promoting projects to increase biodiversity and resolve diffuse water pollution issues<sup>13</sup>.

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<sup>11</sup> Natural Resources Wales (undated). Usk Management Catchment Summary.

<sup>12</sup> Natural Resources Wales (undated). South East Valleys Management Catchment Summary.

<sup>13</sup> 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.

- **Applying policy and good practice guidance to ensure the incorporation of sustainable drainage schemes (SuDS) into all new development** such as the Glan Llyn housing development and Cardiff's Strategic Development Site H (**Figure 3.9**), 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.

## 4.3 Sustainable Farming

4.3.1 There is a need to manage the agricultural landscape of the Gwent Levels sustainably (see **Figure 3.11**). A sustainable approach to farming is critical for supporting the protection of soils and water, biodiversity and locally distinctive landscapes in particular.

4.3.2 Opportunities for addressing these needs 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 (**Figure 3.11**), where appropriate maintaining the existing mixed farming systems, conserving soils (**Figure 3.4**) 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 (**Figure 3.4**), 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. This could potentially be achieved by, in the first instance, identifying farmers who may be prepared to act as 'exemplars' to demonstrate the possibility of operating a commercially viable farm using sustainable land management techniques.
- **Promoting the creation grassland buffer strips** alongside field boundaries and watercourses to reduce soil erosion and run-off, and minimise nutrient leaching.
- **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. Other opportunities for diversification of farm businesses include exploring the potential for restoring and/or planting traditional/low intensively managed orchards using traditional varieties of apple and pear, with a view to developing commercially viable juice, perry and cider production with links to existing breweries (e.g. Tiny Rebel in Cardiff). Particularly where the underlying grassland sward is managed for floristic diversity, orchards would also significantly contribute to the aims and objectives of the B-Lines and other pollinator supporting initiatives.
- **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.

- **Working through co-ordinated and collaborative management with existing projects**, and specifically across the suite of nature reserves (**Figure 3.5**), 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. For example, the creation of connected semi-natural habitats linking the Newport Wetlands, Great Traston Meadows and Magor Marsh Nature Reserves on Caldicot Level would require collaboration between NRW/RSPB, Gwent Wildlife Trust, businesses (Eastman) and private landowners, that could act as an exemplar for future, similar, opportunities.
- **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 (**Figure 3.13**).
- **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.

## 4.4 Estuarine Processes

4.4.1 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 (**Figure 3.8**) and the associated river estuaries. The estuary is an important influence on the ecological and historic character of the study area.

4.4.2 Opportunities for addressing these needs could include:

- **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.
- **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 undergrazing of this important inter-tidal habitat to reduce negative effects on the botanical and ecological interest (such as on Wenthooge Level).
- **Diversifying the grassland sward on the seawall banks**, without compromising its integrity or the ability to inspect the condition/integrity of the sea defences (**Figure 3.8**), should be considered. Increasing floristic diversity and implementing a sympathetic mowing regime has the potential for the creation of a strategic 'B-Lines' 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 in accordance with their internationally important status.
- **Identifying opportunities along the Rivers Rhymney, Usk/Ebbe and Wye where river banks could potentially be set back** to increase riparian habitats.
- **Incorporating coastal heritage sites (Figures 3.6 and 3.7) 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.

## 4.5 Access and Recreation

4.5.1 There is a need to improve access and recreation facilities for local communities and visitors to the Gwent Levels (see **Figure 3.12**). 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.

4.5.2 The GI opportunities outlined in this section have informed the Living Levels Destination Management Plan, which aims to raise awareness of the Gwent Levels landscape heritage, its value and unique experience and offer to visitors. The Destination Management Plan includes costed delivery action plans for interpretation and signage, visitor access and integrated marketing of the Levels.

4.5.3 Opportunities for GI to help in addressing access and recreation needs 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** as identified the Gwent

Levels Landscape Character Assessment (a unique hand-crafted cultural landscape; an accidental wildlife oasis; a hidden landscape; and dramatic and dynamic seascapes). For example, distinctive places on Mathern Level along the Wales Coast Path include Black Rock and Sudbrook Point, which offer dramatic long distance views across the Severn Estuary towards England framed by the two Severn Bridge Crossings. Chepstow Rail Station is a key gateway to Mathern Level and also the Lower River Wye.

Other examples of distinctive places, gateways and routes on or near the Caldicot and Wentlooge Levels include:

- ❖ Severn Tunnel Junction and Caldicot Rail Stations
- ❖ Caldicot Castle Country Park
- ❖ Magor Marsh Nature Reserve
- ❖ Redwick Village, St Thomas Church and environs
- ❖ Wilcrick Hill Fort (an historic vantage point with extensive views over Caldicot Level)
- ❖ Llanwern Park (adjacent to Caldicot Level)
- ❖ Glan Llyn development (includes a substantial area of new wetland parkland)
- ❖ Great Traston Meadows Nature Reserve
- ❖ Goldcliff and environs along the Wales Coast Path
- ❖ Newport Wetlands National Nature Reserve along the Wales Coast Path



- ❖ Newport Station and the Riverfront Walk connecting the station to the industrial heritage of Newport Docks and the Transporter Bridge and the Wales Coast Path
- ❖ Lighthouses on the eastern and western banks of the Usk Estuary
- ❖ St Brides Village, church and environs
- ❖ Lighthouse Park/Inn on the Wales Coast Path
- ❖ Marshfield Village, St Mary's Church and environs
- ❖ Peterstone Village, former St Peter's Church and environs
- ❖ Peterstone Wentlooge Marshes
- ❖ Hendre Lake near St Mellons
- ❖ Lamby Way Landfill Site/Parc Tredeleirch (potential in longer term for creation of a substantial new country park with access along the coast)
- ❖ Tredegar House Country Park (adjacent to Wentlooge Level)
- ❖ Sirhowy Valley Walk (connecting with Wentlooge Level along the River Ebbw corridor)
- ❖ Rhymney River Walk (connecting Cardiff to Wentlooge Level)

- **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; south of Caldicott; east of Newport Wetlands National Nature Reserve to Goldcliff; the Newport river mouth (in the longer term, as urban land use changes come forward); and in relation to the restoration and afteruse of the Lamby Way Landfill Site.
- **Enhancing connectivity between Mathern Level/Caldicot Level and local communities/greenspaces in the Monmouthshire Severnside Settlements** such as: strengthening the Nedern Brook corridor through the buffering of semi-natural habitat with adjacent fields and the built urban landscape, and connect with other semi-natural habitats in the vicinity, where possible; strengthening the St Bride's Brook/Mill Reen corridor through the creation and management of semi-natural habitat buffers with adjacent

fields and adjacent built urban landscape; and strengthening the connectivity between the ancient semi-natural woodland Sites of Importance for Nature Conservation (SINCs) centred on Portskewett Hill through buffering or the creation of semi-natural habitats to provide linkages between the sites<sup>14</sup>. In addition, other opportunities include promoting enhanced access to the Magor Marsh Nature Reserve and the Wales Coastal Path.

- **Enhancing connectivity between the western part of Caldicot Level/the eastern part of Wentlooge Level and local communities/greenspaces in Newport** in accordance with the principles and relevant opportunities described in the Newport Environmental Spaces Study<sup>15</sup> (such as safeguarding existing spaces and creating new spaces for amenity, nature conservation and recreation provision within development sites; and enhancing existing provision, either through specific improvement schemes or through the redevelopment of neighbouring or nearby land). In addition, other opportunities include linking the wetland park created as part of the Glan Llyn development with Caldicot Level and promoting

enhanced access to the Newport Wetlands National Nature Reserve and the Great Traston Meadows Nature Reserve.

- **Enhancing connectivity between the western part of Wentlooge Level and local communities/greenspaces in Cardiff** by implementation of the opportunities described in the Cardiff Open Space Supplementary Planning Guidance<sup>16</sup>, which provides detail of current recreational open space provision in the Cardiff wards within the study area. Whilst there is a deficit in the Pontyprennan and Old St. Mellons district, the Llanrumney and Rumney districts meet the required provision for open space set by the standards. Importantly, there is a need to identify enhanced connectivity between the districts and their respective open space provision, and Wentlooge Level. There are significant barriers including both Lamby Way and the railway line, and means to enable these to be crossed should be considered. Other opportunities include creation of new and improved connections between Cardiff City and Wentlooge Level as part of the Cardiff Strategic Development Site H, including the provision of access across the railway line. Such opportunities may link with, or be identified through, the Hendre Lake Management Plan. In addition, once it has ceased to be operational the restoration of the Lamby Way Landfill Site

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<sup>14</sup> For further details see pages 118-119 in Appendix F of the Monmouthshire Green Infrastructure Supplementary Planning Guidance (Monmouthshire County Council, Adopted April 2015, prepared by Chris Blandford Associates)

<sup>15</sup> Newport City Council (June 2013). Newport Local Development Plan 2011-2016. Environmental Spaces Background Paper.

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<sup>16</sup> Cardiff County Council (2008). Open Space Supplementary Planning Guidance.

provides an opportunity to develop a country park to act as a western gateway to the coast and the Gwent Levels.

- **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. Other opportunities could include promoting the important role played by water, geology/soils and drainage in the development of the landscape through a network of interpretation sites, particularly on the coast, where existing roads and rights of way make them readily accessible, such as at St. Bride's Wentlooge, Goldcliff and Black Rock.

## 5.0 GREEN INFRASTRUCTURE STRATEGY

### 5.1 General

- 5.1.1 Communities in the Gwent Levels 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 the Gwent Levels to respond to environmental change and human pressures is at risk.
- 5.1.2 Careful planning and management is important in identifying interventions that maximise the multiple functions and benefits which integrated networks of GI can provide. The GI Strategy highlights opportunities for GI creation, enhancement and investment in the Gwent Levels, which in turn can benefit local communities, the economy and the environment. It provides a framework which identifies important elements of the GI network that require protection and management actions to improve their function or quality.

- 5.1.3 The GI Strategy seeks to contribute to improving the economic, social, environmental and cultural well-being of the Gwent Levels in accordance with the principle of sustainable development, ways of working and goals (see **Box 5.2**) enshrined by the Well-being of Future Generations (Wales) Act 2015. The principle of sustainable development is to ensure that the needs of the present are met without compromising the ability of future generations to meet their own *needs*. The GI Strategy promotes the following five “*ways of working*” advocated by the 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.

- 5.1.4 As highlighted in **Box 5.1**, implementation of the GI Strategy would help the Living Levels Landscape Partnership work contribute towards the Act’s seven “*well-being goals*” that the public sector should aim for in delivering sustainable development.

### Box 5.1 – Relationship of Gwent Levels Landscape and Green Infrastructure Themes to Well-being Goals

<i><b>Gwent Levels Landscape Themes (Special Qualities)<sup>17</sup></b></i>	<i><b>Gwent Levels GI Opportunity Themes<sup>18</sup></b></i>	<i><b>Contribution to Well-Being Goals<sup>19</sup></b></i>
A Unique Hand-Crafted Cultural Landscape	<ul style="list-style-type: none"> <li>• Water Management</li> <li>• Sustainable Farming</li> </ul>	<ul style="list-style-type: none"> <li>• A Prosperous Wales (1)</li> <li>• A Resilient Wales (2)</li> <li>• A Healthier Wales (3)</li> <li>• A Wales of Vibrant Culture and Thriving Welsh Language (6)</li> </ul>
A Wildlife Oasis	<ul style="list-style-type: none"> <li>• Water Management</li> <li>• Sustainable Farming</li> </ul>	<ul style="list-style-type: none"> <li>• A Prosperous Wales (1)</li> <li>• A Resilient Wales (2)</li> <li>• A Healthier Wales (3)</li> <li>• A Globally Responsive Wales (7)</li> </ul>
A Hidden Landscape	<ul style="list-style-type: none"> <li>• Access and Recreation</li> </ul>	<ul style="list-style-type: none"> <li>• A Prosperous Wales (1)</li> <li>• A Healthier Wales (3)</li> <li>• A More Equal Wales (4)</li> <li>• A Wales of Cohesive Communities (5)</li> <li>• A Wales of Vibrant Culture and Thriving Welsh Language (6)</li> </ul>
Dramatic and Dynamic Seascapes	<ul style="list-style-type: none"> <li>• Estuarine Processes</li> </ul>	<ul style="list-style-type: none"> <li>• A Resilient Wales (2)</li> <li>• A Healthier Wales (3)</li> </ul>

<sup>17</sup> See Section 4.0 of Gwent Levels Landscape Character Assessment for details

<sup>18</sup> See Section 4.0 of GI Strategy for details

<sup>19</sup> See Box 5.2 for details

### Box 5.2 – Well-being 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*

## 5.2 Vision

- 5.2.1 The long-term aspirational vision for the future provision and management of GI in the Gwent Levels is set out in **Box 5.3** below:

### **Box 5.3 – Green Infrastructure Vision for the Gwent Levels**

The Gwent Levels' unique natural and historic environment is an irreplaceable legacy that is widely valued, cared for and celebrated.

A well-connected multifunctional network of green and blue spaces and corridors connects the Gwent Levels with people in the surrounding urban conurbations, provides opportunities for visitors to access the landscape and supports wildlife.

The integrity and connectivity of the green infrastructure network is maintained and enhanced by local stakeholders, communities and farmers working together. The interdependency and multifunctionality of historic landscape, cultural heritage and biodiversity elements within the agriculturally productive landscape is widely recognised, and are managed holistically.

Investment in green infrastructure underpins the provision of economic, social and environmental benefits for the Gwent Levels by supporting sustainable growth, improving quality of life and place, delivering ecosystem services and tackling climate change.

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

- 5.2.2 The vision is underpinned by the following three core aims:

1. **Understand and appreciate the Gwent Levels' unique cultural and natural landscape<sup>20</sup>**, recognising its contribution to the vibrancy and distinctiveness of South East Wales.
2. **Conserve, protect and improve/enhance the Gwent Levels' GI assets**, capitalising on opportunities for attracting investment, conservation-led land management and positive place shaping.
3. **Enjoy, celebrate and engage with the Gwent Levels' rich history**, promoting the area as a distinctive and welcoming place to live, work and visit for current and future generations.

- 5.2.3 Together, the vision and three core aims provide the overarching framework for positive actions by all stakeholders involved in the protection and management of GI in the Gwent Levels, both over the lifetime of the Living Levels Landscape Partnership Scheme and beyond.

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<sup>20</sup> The Gwent Levels Landscape Character Assessment provides the starting point for understanding and appreciating the special cultural and natural qualities of the Gwent Levels.

## 5.3 Green Infrastructure Principles

- 5.3.1 Key GI principles that support delivery of the Strategy's core aims are outlined below. The principles are presented under five objectives for the planning, management and delivery of GI in the Gwent Levels (see **Box 5.4**). The GI objectives reflect the goals of the Well-being of Future Generations (Wales) Act 2015 and the relevant local GI policy context for the Gwent Levels (see **Appendix B** for details).
- 5.3.2 The principles are intended to help in the identification and selection of GI projects for funding (including those included in the Living Levels' Landscape Conservation Action Plan), and also for use in monitoring the outcomes of projects.
- 5.3.3 An important overarching principle is the need to recognise the multi-functionality of GI assets and to maximise the benefits different assets can deliver. For example, greenspaces can be used for sustainable food production, contribute to flood management, and provide access to nature and informal recreation opportunities. In the spirit of the Living Levels Landscape Partnership Scheme, it is therefore essential that the inter-relationship and connections between individual GI projects are considered in the round to ensure that opportunities for shared outcomes and mutual benefits are maximised.

### Box 5.4 – Green Infrastructure Objectives

- Improve health and well-being
- Increase biodiversity and access to nature
- Strengthen landscape character and distinctiveness
- Adapt to and mitigate the effects of climate change
- Support sustainable economic development

### **Improve health and well-being**

5.3.4 Improving the health and well-being of communities in the Gwent Levels will help contribute to the goal of creating 'A Healthier Wales' in respect of people's physical and mental well-being. It will also help contribute to the goal of creating 'A Wales of Vibrant Culture and Thriving Welsh Language' in respect of participation in recreational activities.

5.3.5 The key principles underpinning this objective are:

- Promoting opportunities for sustainable access and recreation that encourage healthy lifestyles and improve well-being for communities in the Gwent Levels, including creating 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 Gwent Levels countryside.
- Provision of well-connected, multifunctional greenspaces close to urban communities in the Gwent Levels to encourage physical exercise, and create community gardens/allotments and places for people to meet and interact.

### **Increase biodiversity and access to nature**

5.3.6 Increasing biodiversity in the Gwent Levels will help contribute to the goal of creating 'A Resilient Wales' in respect of maintaining a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change. In addition, increasing access to nature in the Gwent Levels will also help contribute to the goal of creating 'A Healthier Wales' in respect of people's mental well-being.

5.3.7 The key principles underpinning this objective are:

- Ecosystem services on which the prosperity and well-being of communities in the Gwent Levels depend should be safeguarded and enhanced by an integrated approach to maintenance of the historic water management/drainage systems that created its remarkable wetland habitats.
- Adoption of a 'living' landscape-scale approach to reversing habitat loss and fragmentation within the Gwent Levels by working collaboratively to achieve a more resilient, bigger, better and inter-connected areas for wildlife.
- Increase opportunities for people to access and engage with nature in the Gwent Levels to provide health, mental well-being and education benefits for local communities/visitors.



### **Strengthen landscape character and distinctiveness**

5.3.8 Strengthening the landscape character and distinctiveness of the Gwent Levels will help contribute to the goal of creating 'A Wales of Vibrant Culture and Thriving Welsh Language' in respect of promoting and protecting culture, heritage and the Welsh language. It will also help contribute to the goal of creating 'A Healthier Wales' in respect of the mental well-being benefits for people in experiencing the special qualities of the Gwent Levels.

5.3.9 The key principles underpinning this objective are:

- Reflecting and strengthening the distinctive character of the Gwent Levels through the protection and restoration of distinctive historic and semi-natural landscape features, enhancing and strengthening 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 this hand-crafted landscape, including its distinctive 'Levels Lingo' and unique patterns of drainage, land use, settlement and industry.
- Reinforcing the strong sense of tranquillity, remoteness and wildness found within many places on the Gwent Levels that makes a contribution to people's mental well-being.

### **Adapt to and mitigate the effects of climate change**

5.3.10 Adapting to and mitigating the effects of climate change on the Gwent Levels will help contribute to the goal of 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. It will also help contribute to the goal of 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.

5.3.11 The key principles underpinning this objective are:

- Adapt to and mitigate the potential effects of climate change by enabling Gwent Levels 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 the Gwent Levels 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.

### **Support sustainable economic development**

5.3.12 Supporting sustainable economic development in the Gwent Levels will help contribute to the goal of creating '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.

5.3.13 The key principles underpinning this objective are:

- Creating opportunities for new businesses/income generation, skills development and job creation in the Gwent Levels from environmental land management and conservation, tourism and green technologies.
- Investing in the maintenance and enhancement of GI assets that contribute to the environmental quality of the Gwent Levels, 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 the Gwent Levels such as management of flood risk.
- Making appropriate provision for GI in the masterplanning of new developments in the Gwent Levels that meets local needs, and is well designed and constructed to high environmental sustainability standards.

### **5.4 Green Infrastructure Priorities**

5.4.1 The key priorities for investment in GI over the lifetime of the Living Levels Landscape Partnership Scheme are:

- Enhancing existing GI assets to prepare them for greater visitor numbers and likely increased pressure linked to growth.
- Maximising opportunities for GI assets to bring together both existing and new communities through linking settlements and accessible greenspace, wildlife reserves, urban greenspaces, heritage sites and waterways.
- Generally improving access, linkages and facilities relating to greenspace sites that connect visitors with the Gwent Levels.
- Reversing the erosion and fragmentation of natural and semi-natural habitats in the Gwent Levels, in order to reduce biodiversity loss and provide resilience in the face of climate change.
- Promoting high quality and sensitive design of new development to enhance the integrity and local distinctiveness of the landscape context.

5.4.2 These priorities are reflected in the Green Infrastructure Network for the Gwent Levels illustrated on **Figure 5.1**, which identifies strategic priority areas for improving connectivity of GI assets within the Gwent Levels. These are:

- Between Mathern Level/eastern Caldicot Level and local communities in the Monmouthshire Severnside Settlements;
- Between the western Caldicot Level/eastern Wentlooge Level and local communities in Newport; and
- Between the western Wentlooge Level and local communities in Cardiff.

5.4.3 In these strategic areas, it is recommended that priority is given to investment in projects that help enhance the functionality of the GI assets shown on **Figure 2.1** – in particular, improving connectivity for people and wildlife between natural and semi-natural greenspaces; blue and green corridors; farmland, orchards and allotments; cemeteries and churchyards; parks and gardens; amenity greenspaces; and heritage sites. The projects should be informed by the GI opportunities related to water management, sustainable farming, estuarine processes, and access and recreation outlined in **Section 4.0** as appropriate, taking into account the GI objectives and supporting principles set out above.

## 5.5 Implementation Framework

5.5.1 A framework for implementation of the GI Strategy is outlined below based on the five “*ways of working*” advocated by the Well-being of Future Generations (Wales) Act 2015 (integration; long-term thinking; prevention; collaboration; and involvement).

### The Living Levels Landscape Partnership

5.5.2 The Living Levels Landscape Partnership aims to bring together local stakeholders, communities and farmers to collectively restore, enhance and protect the Levels landscape for all to enjoy. The current partners are: the Royal Society for the Protection of Birds, Gwent Wildlife Trust, Natural Resources Wales, Monmouthshire County Council, Newport City Council, Cardiff City Council, Cardiff Story Museum, Sustrans, The National Trust, Bumblebee Conservation Trust and Buglife.

5.5.3 The Partnership will take the lead in promoting delivery of the GI Strategy over the lifetime of the HLF Landscape Partnership Scheme. It is well placed to ensure that GI is planned, delivered and managed in a coordinated manner to meet the needs of local communities and businesses, protect and enhance the environmental assets, address the challenges of climate change and help underpin economic stability and growth.

5.5.4 For the successful planning, delivery and management of GI in the Gwent Levels, it is recommended that the Partnership focus on:

- Championing the importance, benefits and principles of GI to a wide audience – including the public, private and voluntary sectors;
- Influencing and enabling delivery of GI;
- Marketing and advocacy to promote GI;
- Identification and selection of GI projects for funding;
- Establishing partnerships for the funding, delivery, management and ownership of specific GI projects; and
- Liaising with neighbouring areas to co-ordinate cross-boundary delivery of projects at the sub-regional scale.

5.5.5 The key roles of the Partnership for the delivery of GI should be to:

- Promote adoption of best practice with regards to implementation and long-term maintenance of GI;
- Monitor the implementation of GI, promoting good practice, and monitoring and reporting on annual progress to strengthen the overall GI network;
- Ensure that GI is fully integrated and has a high profile within the work of all local stakeholder partners;
- Promote, disseminate and give assistance and advice on the integration of the GI Strategy into plans, policies and programmes; and

- In the longer-term beyond the lifetime of the HLF Landscape Partnership Scheme, source funding for on-going implementation of legacy GI projects, and advise on budgets for capital and revenue expenditure on GI;

### Sources of Funding for GI Projects

5.5.6 Potential sources of funding for the delivery of GI opportunities (see **Section 4.0**) and GI objectives (see **Section 5.3**) beyond the lifetime of the HLF Landscape Partnership Scheme may include:

- Funding for delivery of GI related to individual developments may be secured from developer contributions provided in line with Local Plan policy;
- The Landfill Tax Communities Fund (to be replaced by a Landfill Disposal Tax Communities Scheme in Wales from April 2018), which distributes grants to community projects using funding generated from landfill taxes in the UK to help mitigate the effects of landfill upon local communities, such as the Local Landscapes programme for transforming derelict areas into new green spaces for local communities delivered by the Partnership;
- Small-scale community grants which provide funding for community-based environmental projects in support of strategic

GI objectives, such as the Big Lottery Fund's 'Community Spaces' environmental programme;

- Private sector funding can play a key role in securing the future of community green space as part of meeting corporate social responsibility objectives;
- Primary Care Trust funding linked to the health agenda such as the Walk Your Way to Health initiative; and
- Safer Neighbourhood funding streams linked to using GI to tackle, for example, anti-social behaviour and providing safe routes for communities.

5.5.7 In the longer term, there is a possibility that a market for payments for ecosystem services may be created which could provide a new source of funding for delivery of GI projects. In 2014, the Welsh Government published a report describing the potential for creating a market that recognises the financial value of ecosystem services to the Welsh economy. Whilst only a feasibility study, the report's recommendations highlight the potential that such an approach could provide for the delivery of GI projects tailored to the stewardship and enhancement of ecosystem services.

5.5.8 The Partnership should consider collaborating and developing alliances with other stakeholders, local communities and businesses with a stake in the future of the Levels (for example the National Farmers Union Cymru; Country Land and Business

Association; Parish/Town Councils; Heritage Wales; and local Business Network Groups such as the Dragons of Newport).

### **Monitoring GI Project Outcomes**

5.5.9 The HLF Landscape Partnership Scheme sets out a series of outcomes that it wishes to see achieved through the implementation of the projects it funds. The GI Strategy is aligned to these outcomes.

5.5.10 It is recommended that the outcomes of the GI projects are monitored by measuring progress against the indicators set out in **Box 5.5.**

**Box 5.5 – Indicators for Monitoring Green Infrastructure Project Outcomes**

- A. The delivery of the GI project has ensured the heritage of the Gwent Levels is identified and protected through planning and recording, and is managed as part of the overall GI network to ensure its condition is maintained and improved – thereby contributing in particular to Well-Being Goal 6 (A Wales of Vibrant Culture and Thriving Welsh Language).
- B. The delivery of the GI project has engaged more local communities and visitors in learning about, experiencing and enjoying the cultural and natural history of the Levels, and engendered a strong sense of ‘ownership’ and greater appreciation of the ecosystems services it provides – thereby contributing in particular to Well-Being Goals 2 (A Resilient Wales) and 6 (A Wales of Vibrant Culture and Thriving Welsh Language).
- C. Local communities are engaged in the delivery of GI projects, contributing time and skills to teach people about the Gwent Levels and how it is managed by people as a ‘hand crafted’ landscape – thereby contributing in particular to Well-Being Goals 1 (A Prosperous Wales), 4 (A More Equal Wales) and 6 (A Wales of Vibrant Culture and Thriving Welsh Language).

- D. The delivery of the GI project has improved access to the Levels for local communities to enjoy for peaceful recreation – thereby contributing in particular to Well-Being Goals 3 (A Healthier Wales), 5 (A Wales of Cohesive Communities) and 6 (A Wales of Vibrant Culture and Thriving Welsh Language).

### **Green Infrastructure Legacy Strategy**

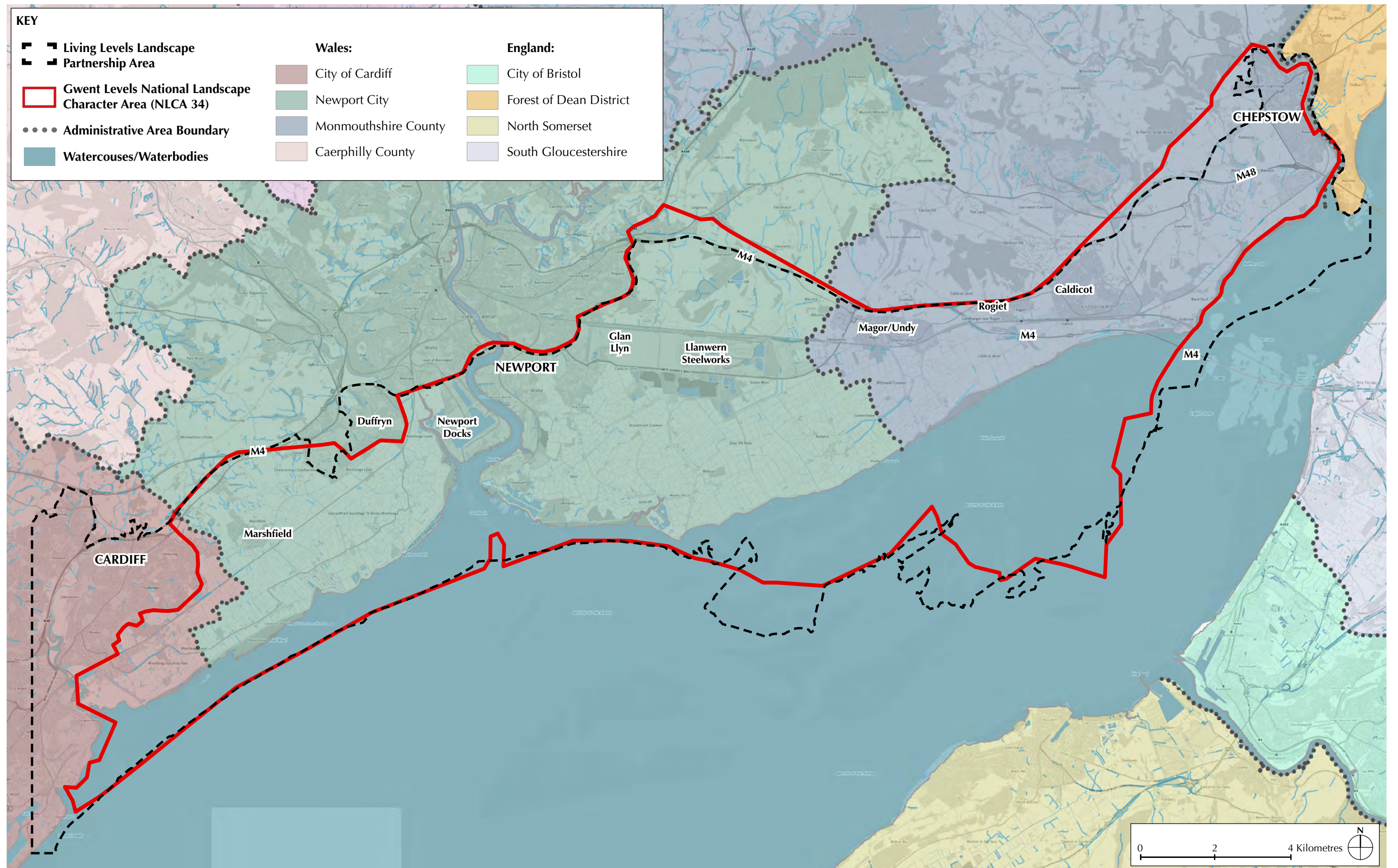
5.5.11 Beyond the lifetime of the Living Levels Landscape Partnership Scheme, it is important that a clear strategy is in place for securing a legacy from the initial investment in GI projects during the delivery phase of the HLF scheme.

5.5.12 The on-going commitment, skills, knowledge and collaborative working established by the Partnership in the development phase of the HLF bid will be crucial to ensuring that the benefits promoted by this GI Strategy are secured for the well-being of future generations in line with the principles of sustainable development. These are likely to include legacy benefits around reconnecting local communities to their landscape and providing a more sustainable future for the Gwent Levels by:

- Forging strong partnerships, with the community at its heart;
- Recapturing and enhancing the natural and historic heritage;
- Celebrating its stories;
- Providing new opportunities for learning, developing skills, participation and investment;
- Encouraging and providing access for all; and
- Building capacity and resilience for the long-term.

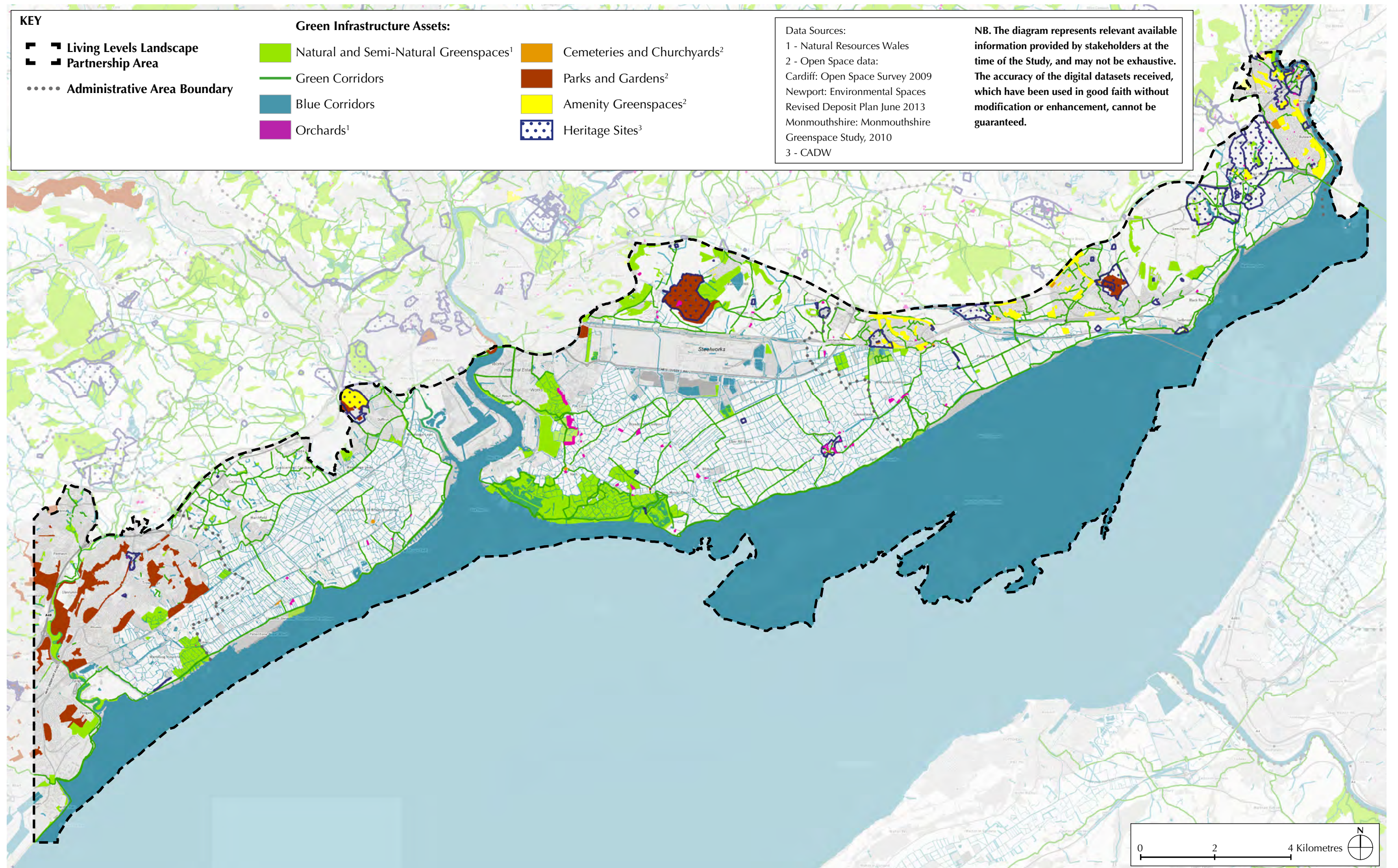
## FIGURES





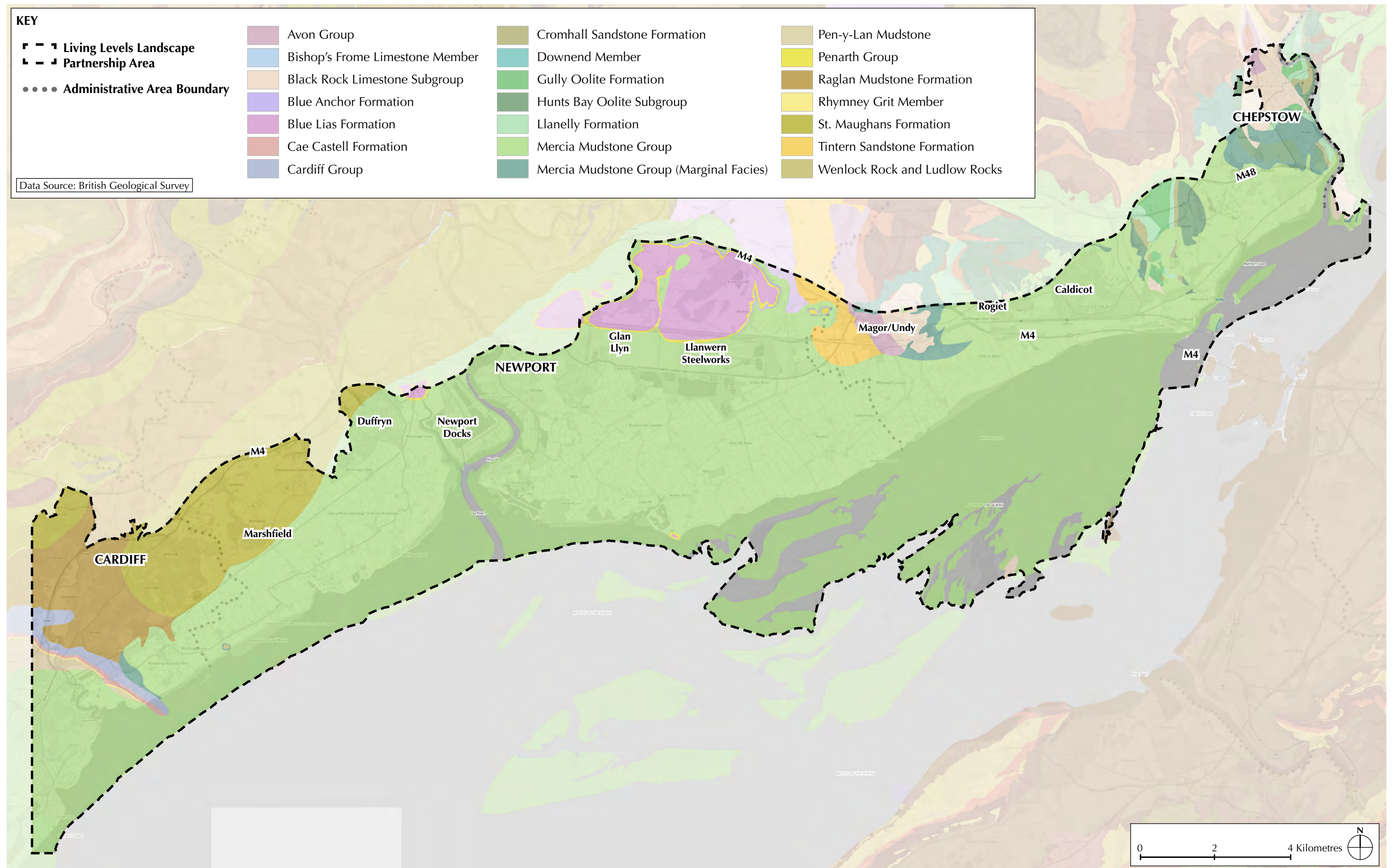
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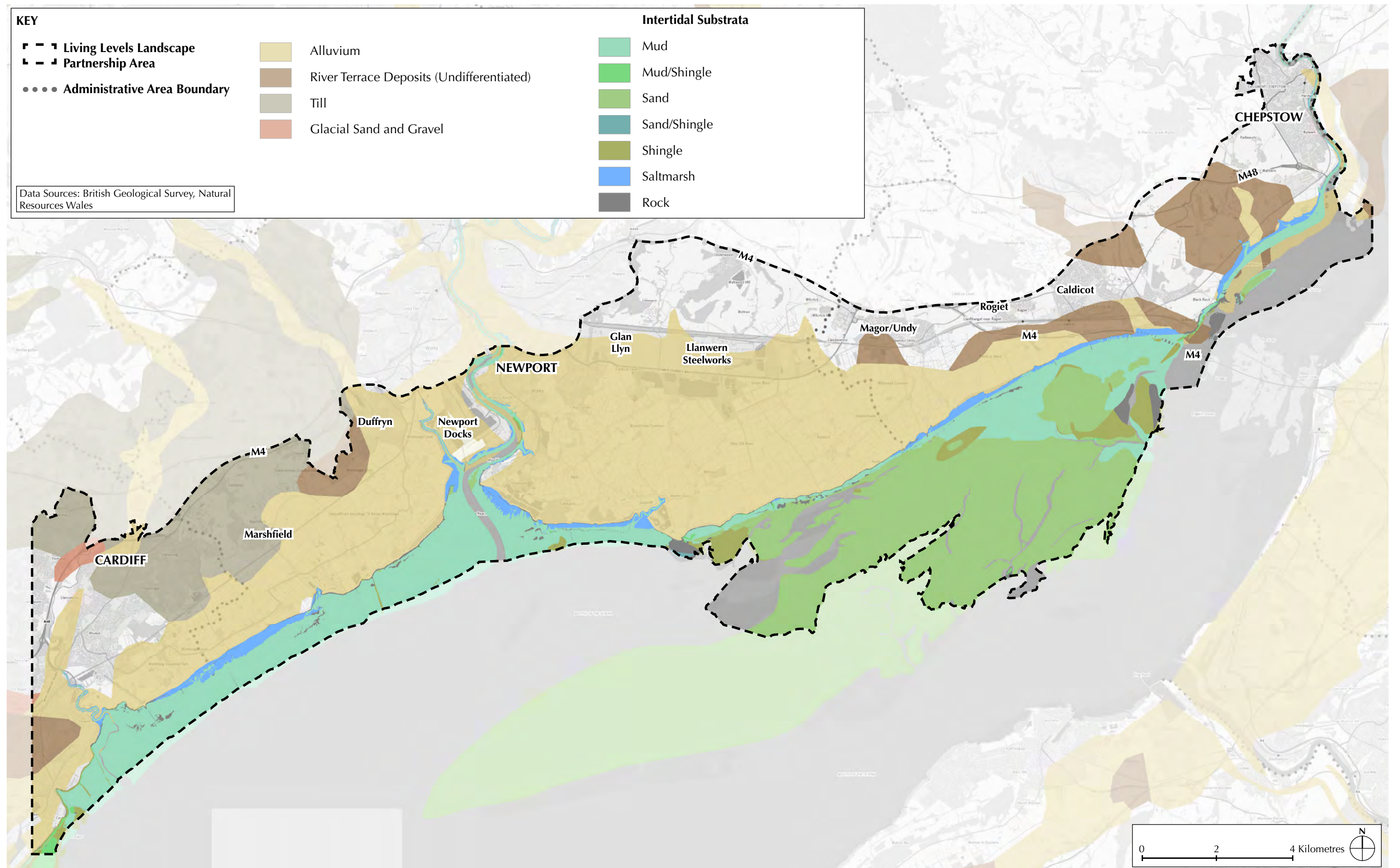
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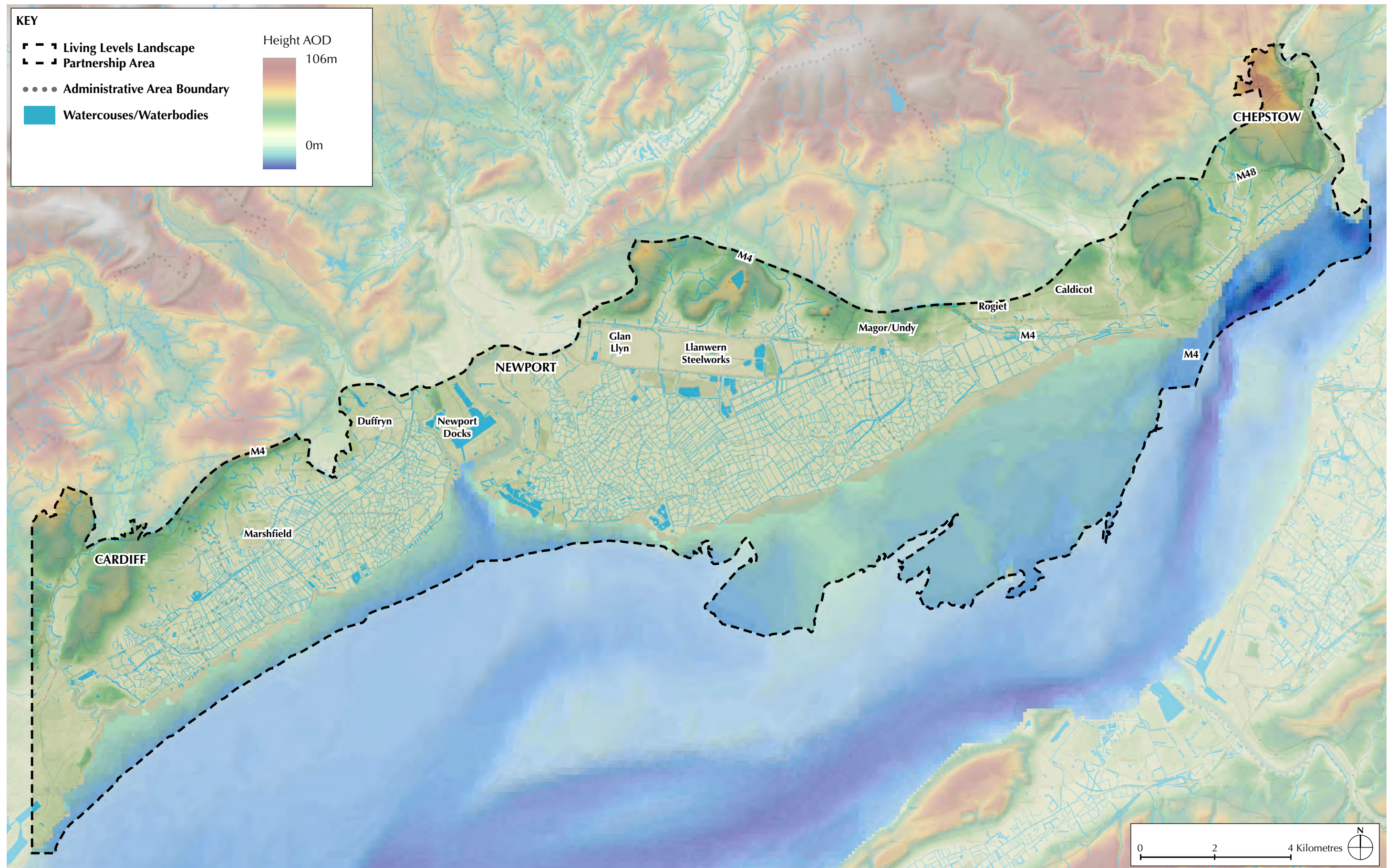
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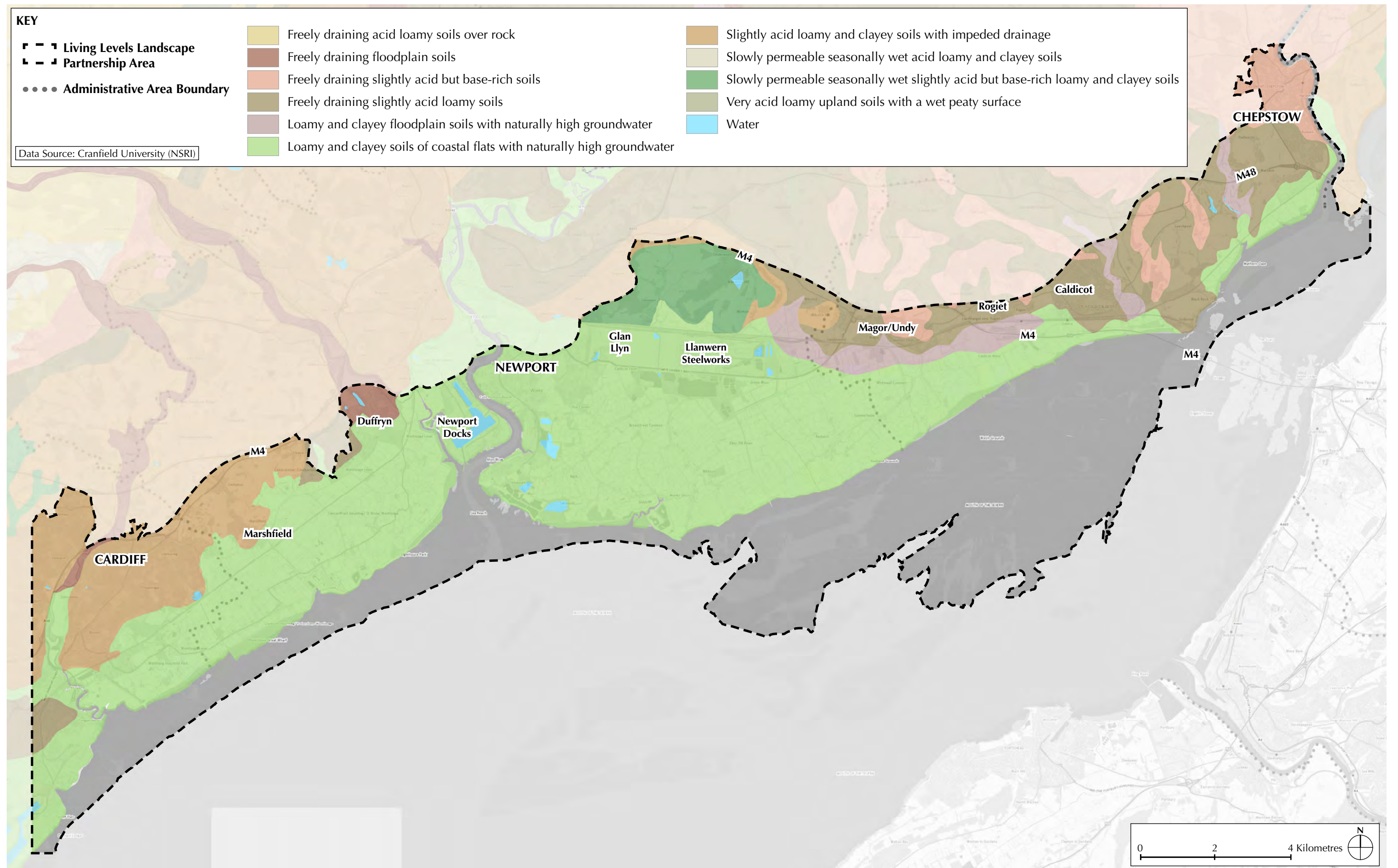
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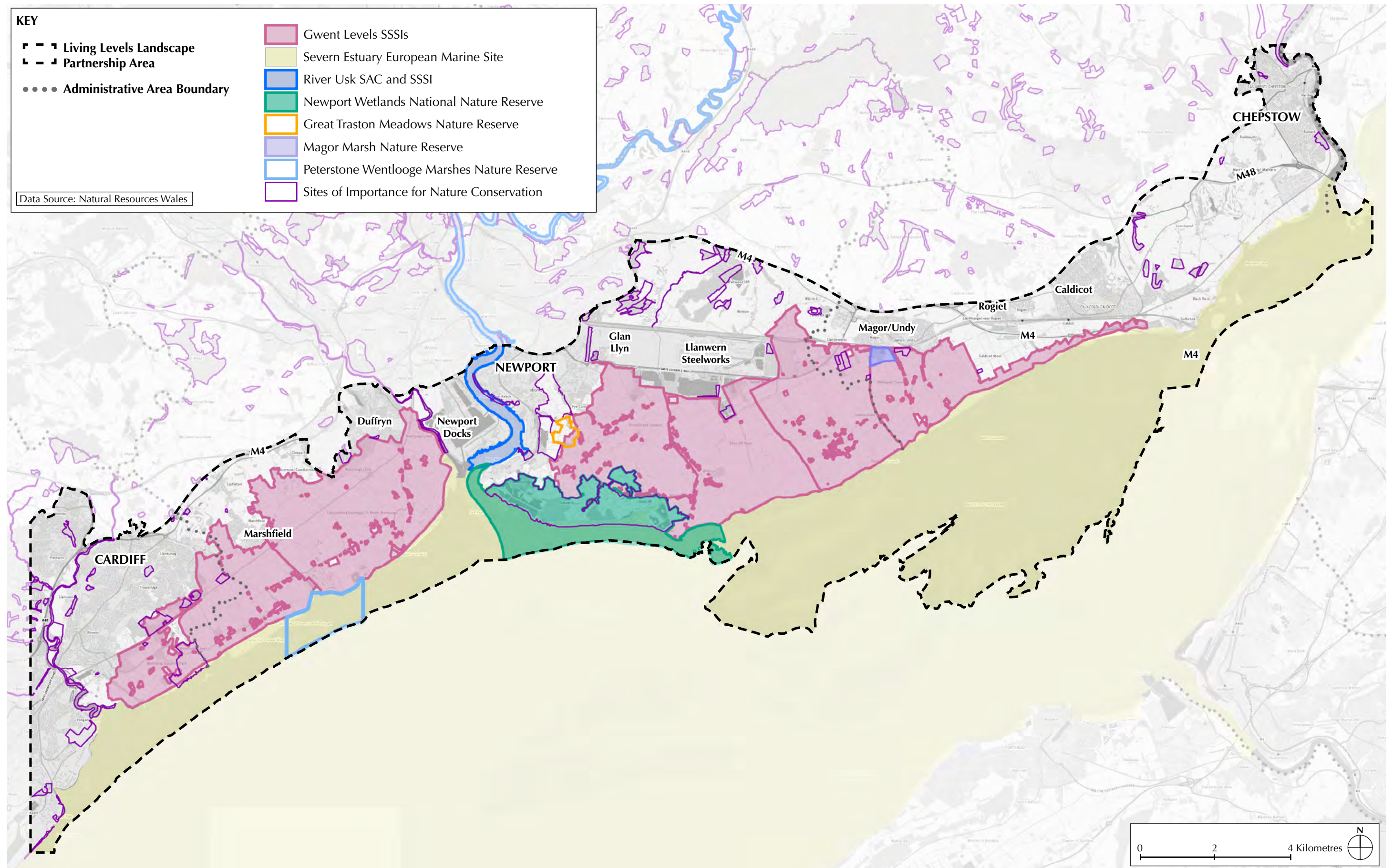
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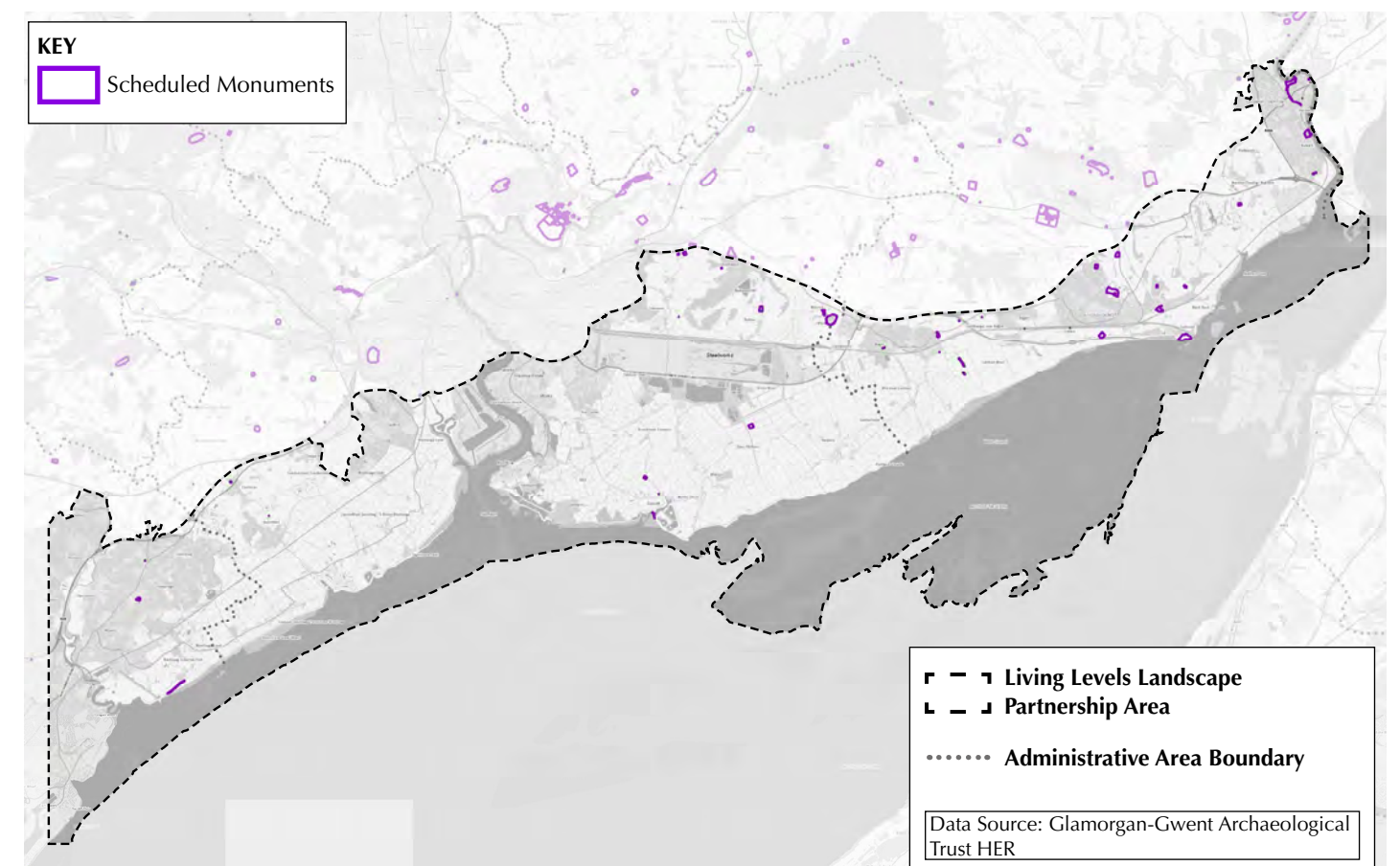
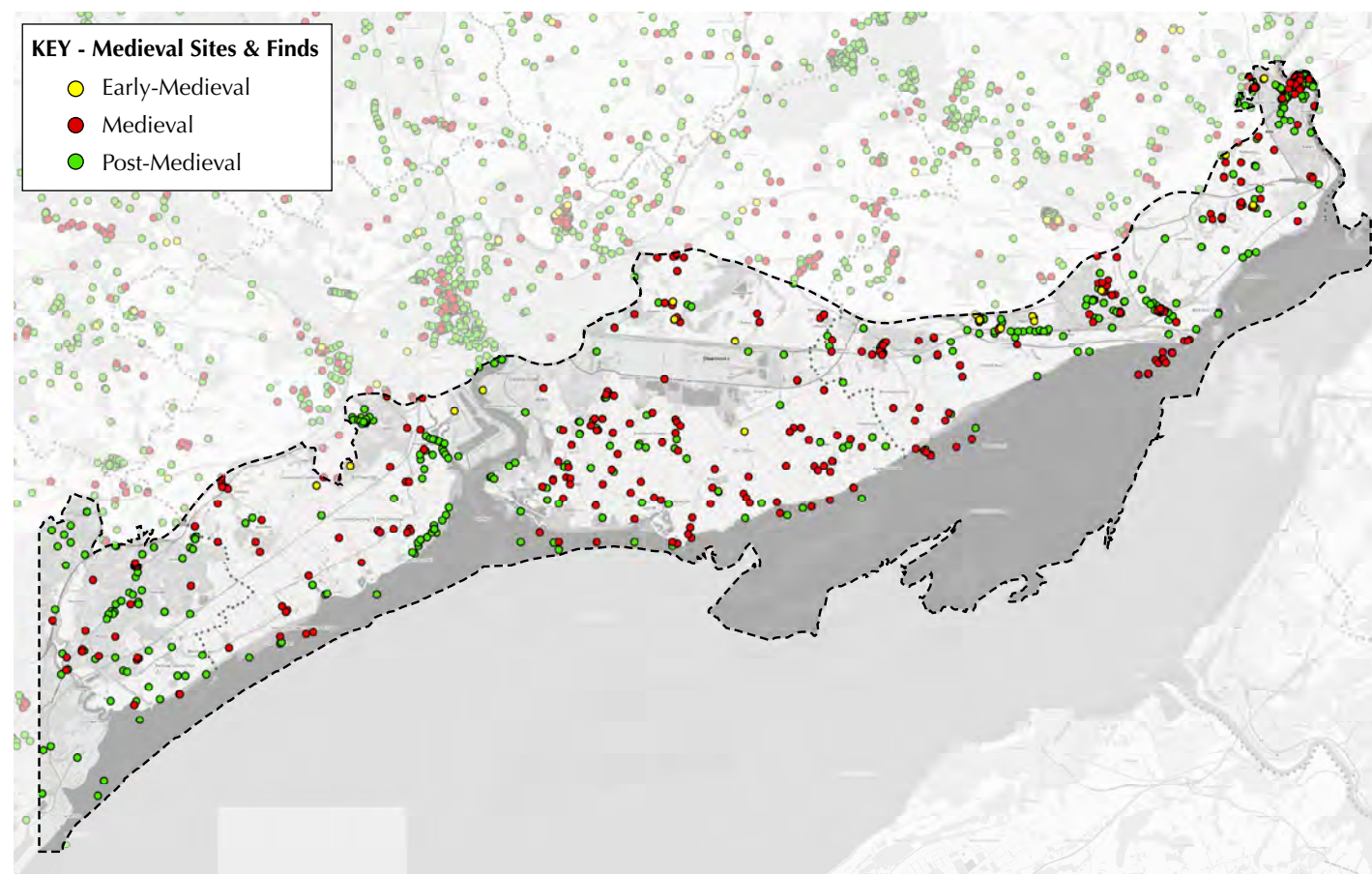
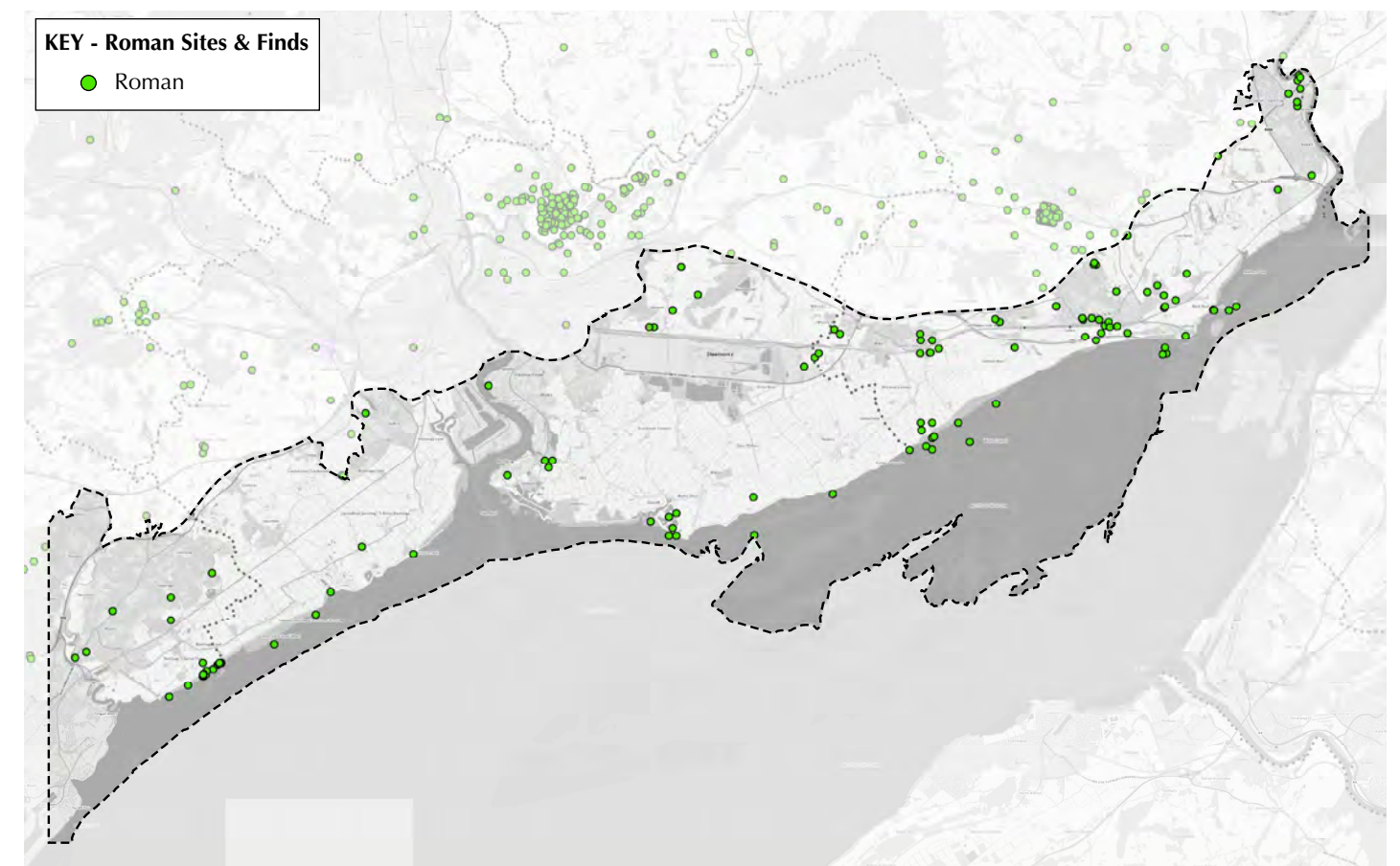
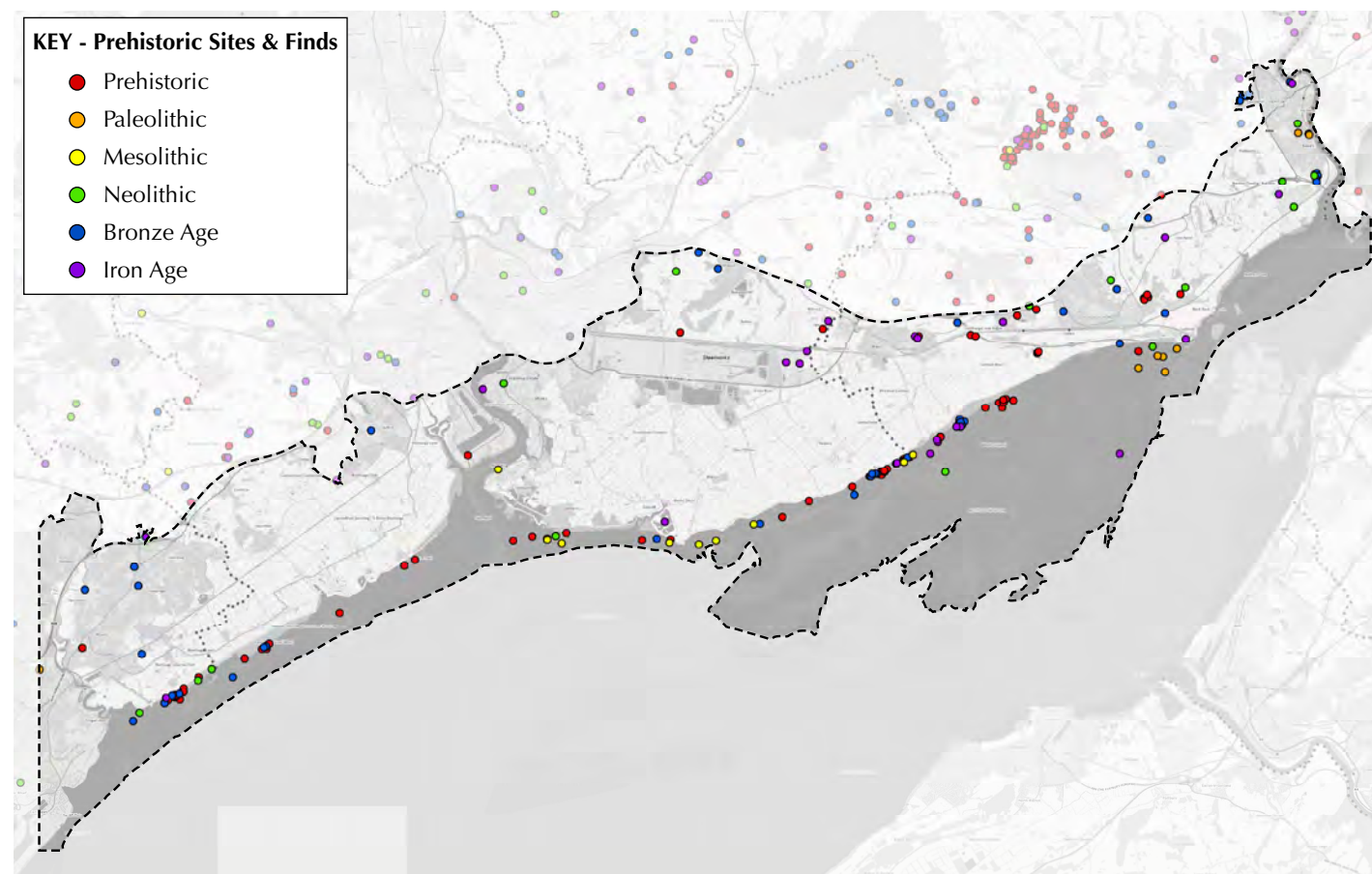
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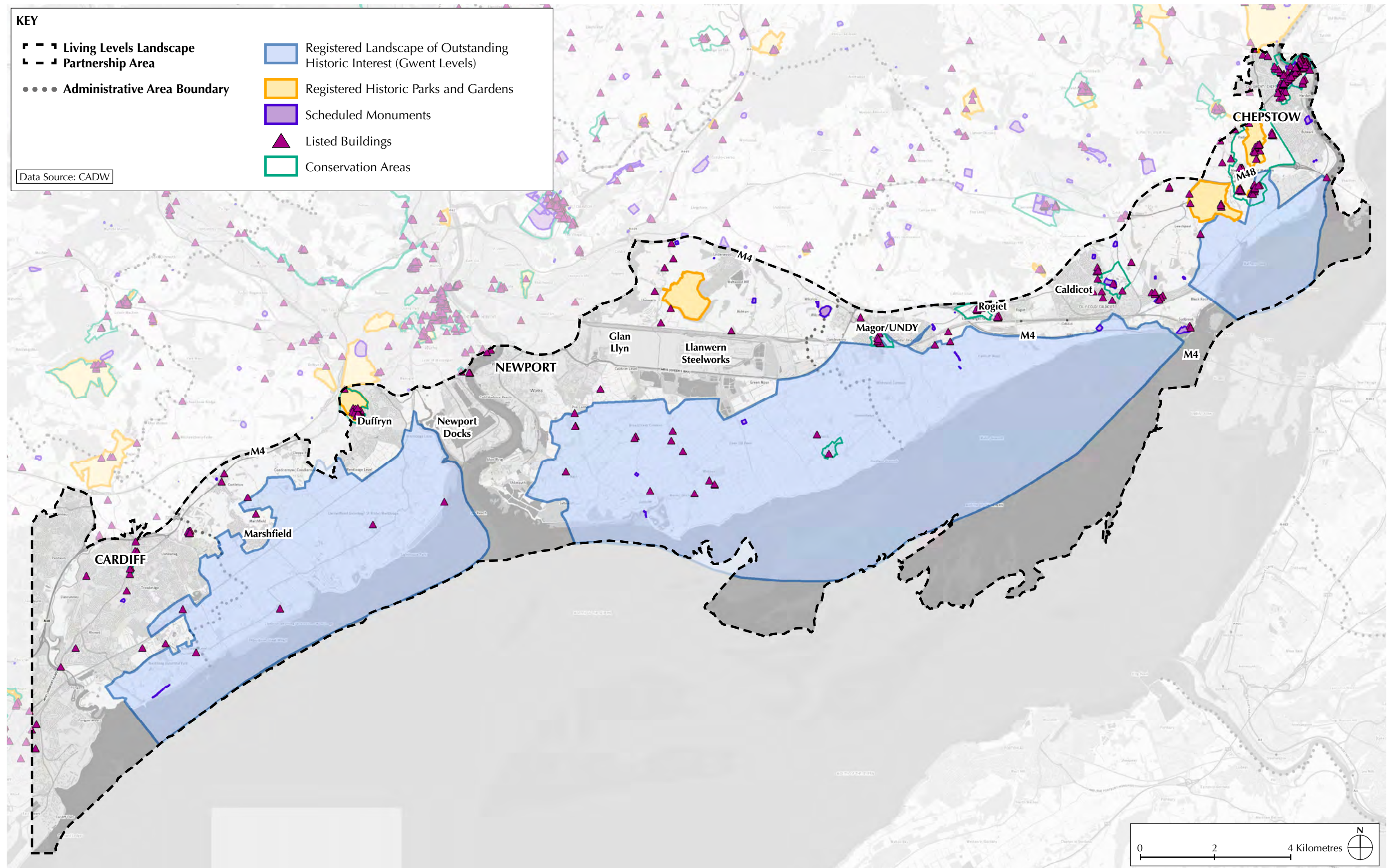
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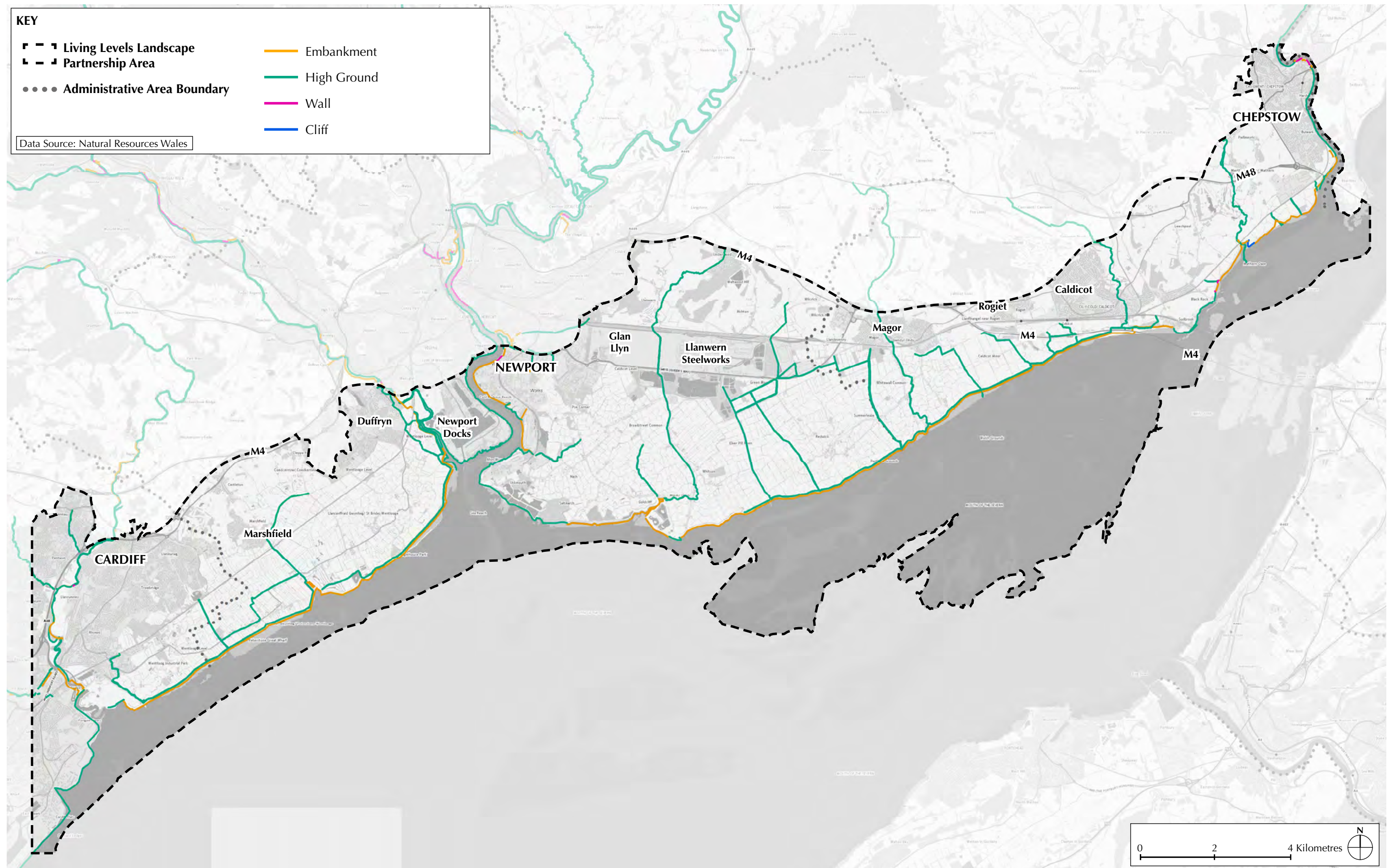
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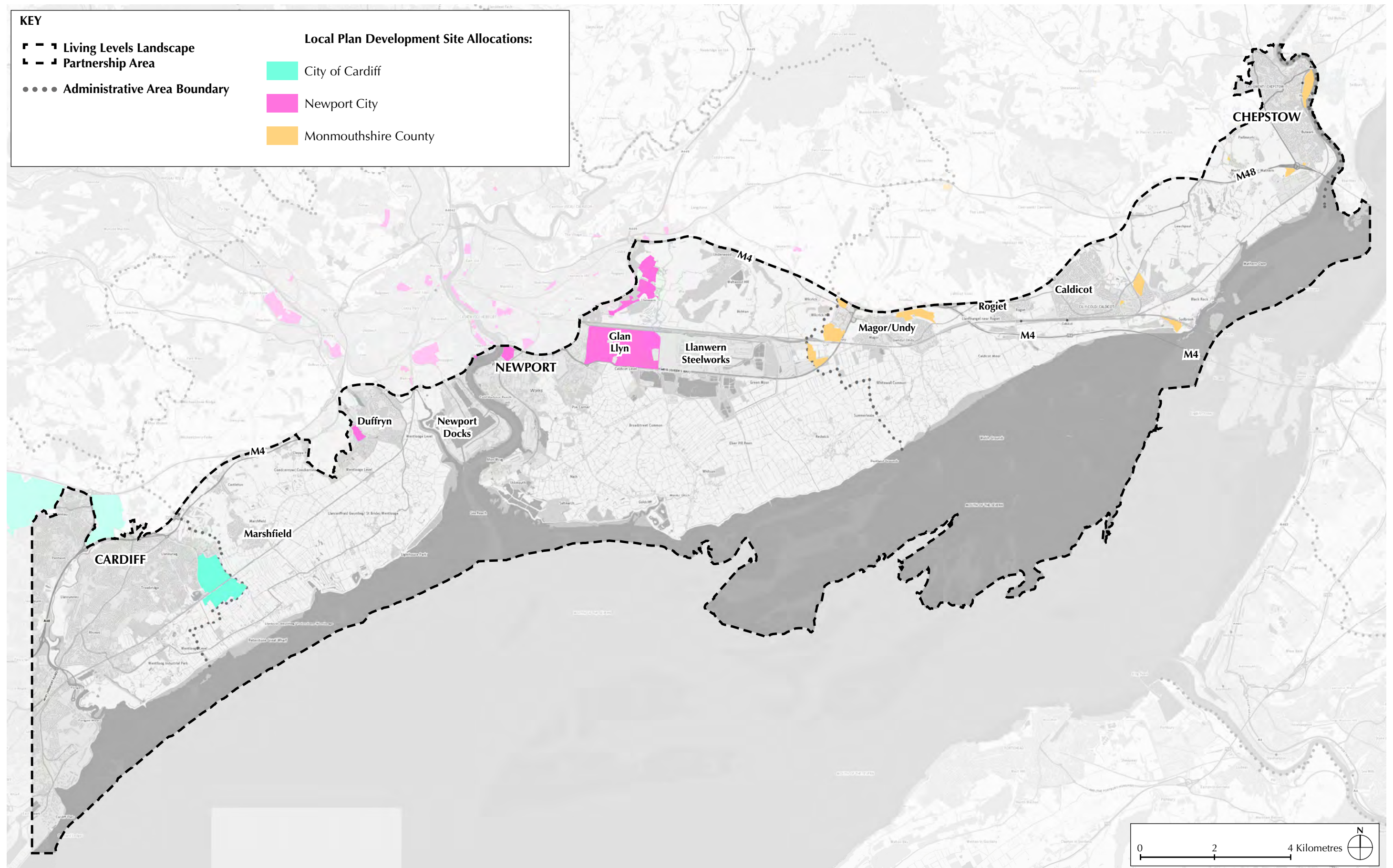
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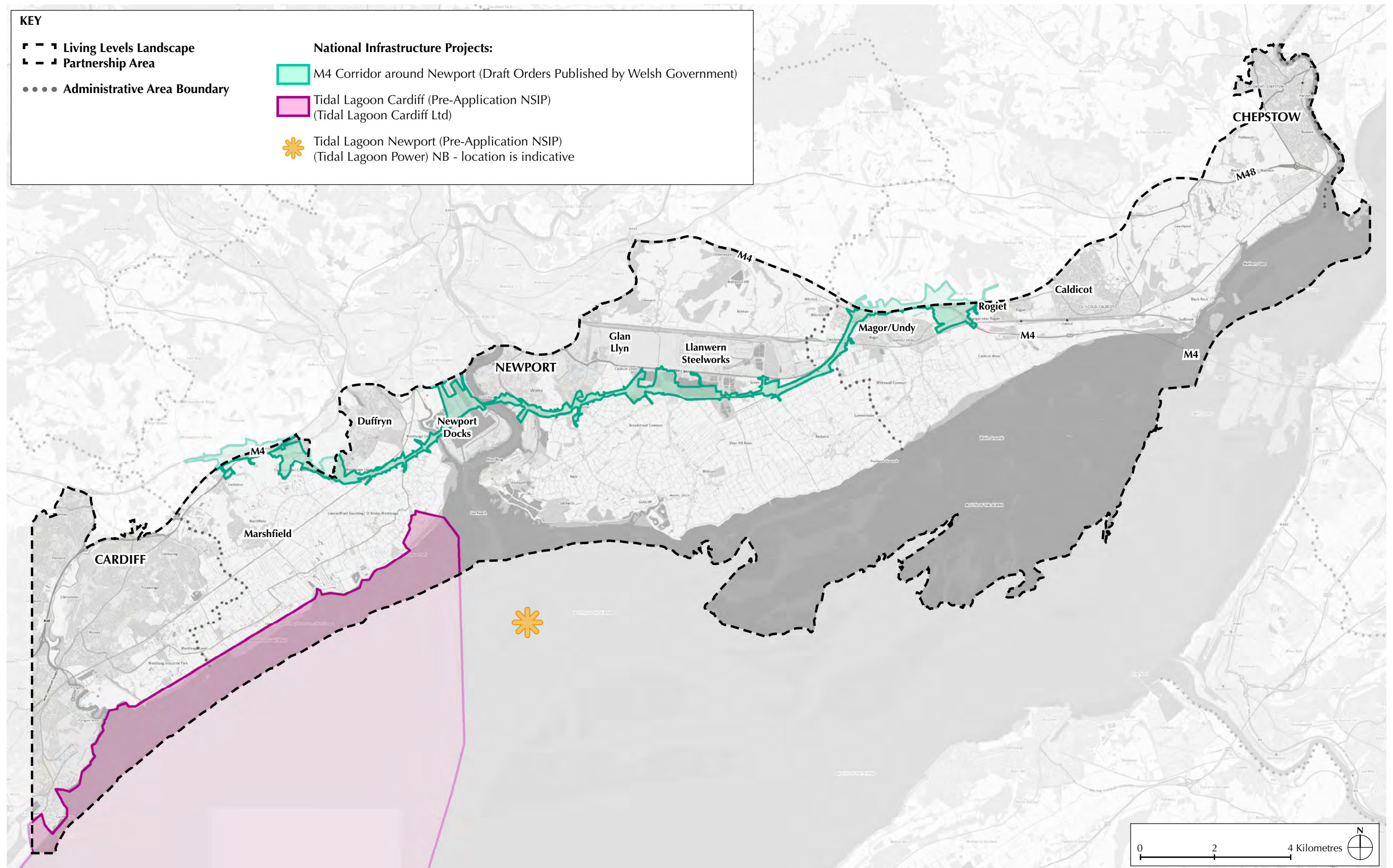
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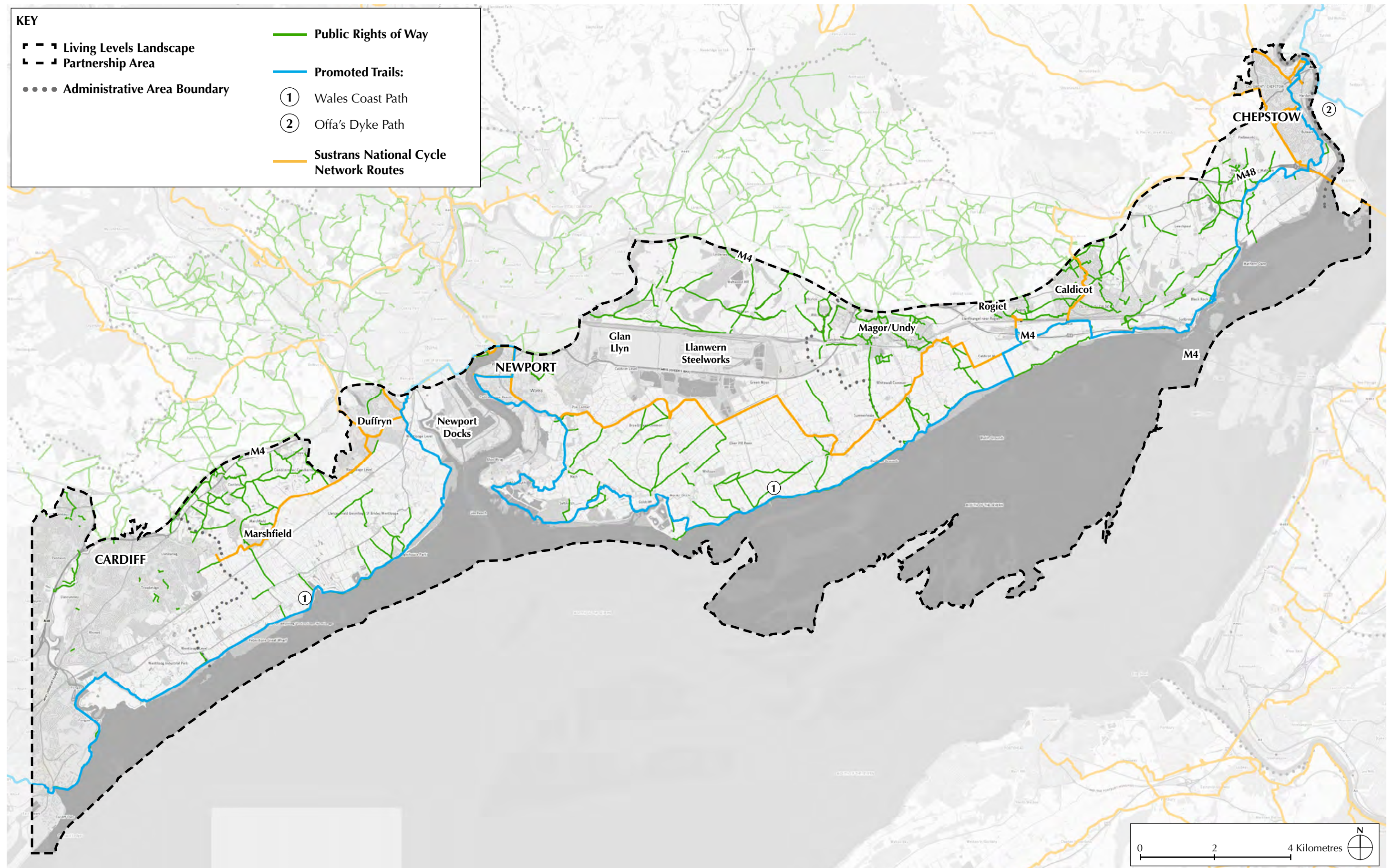
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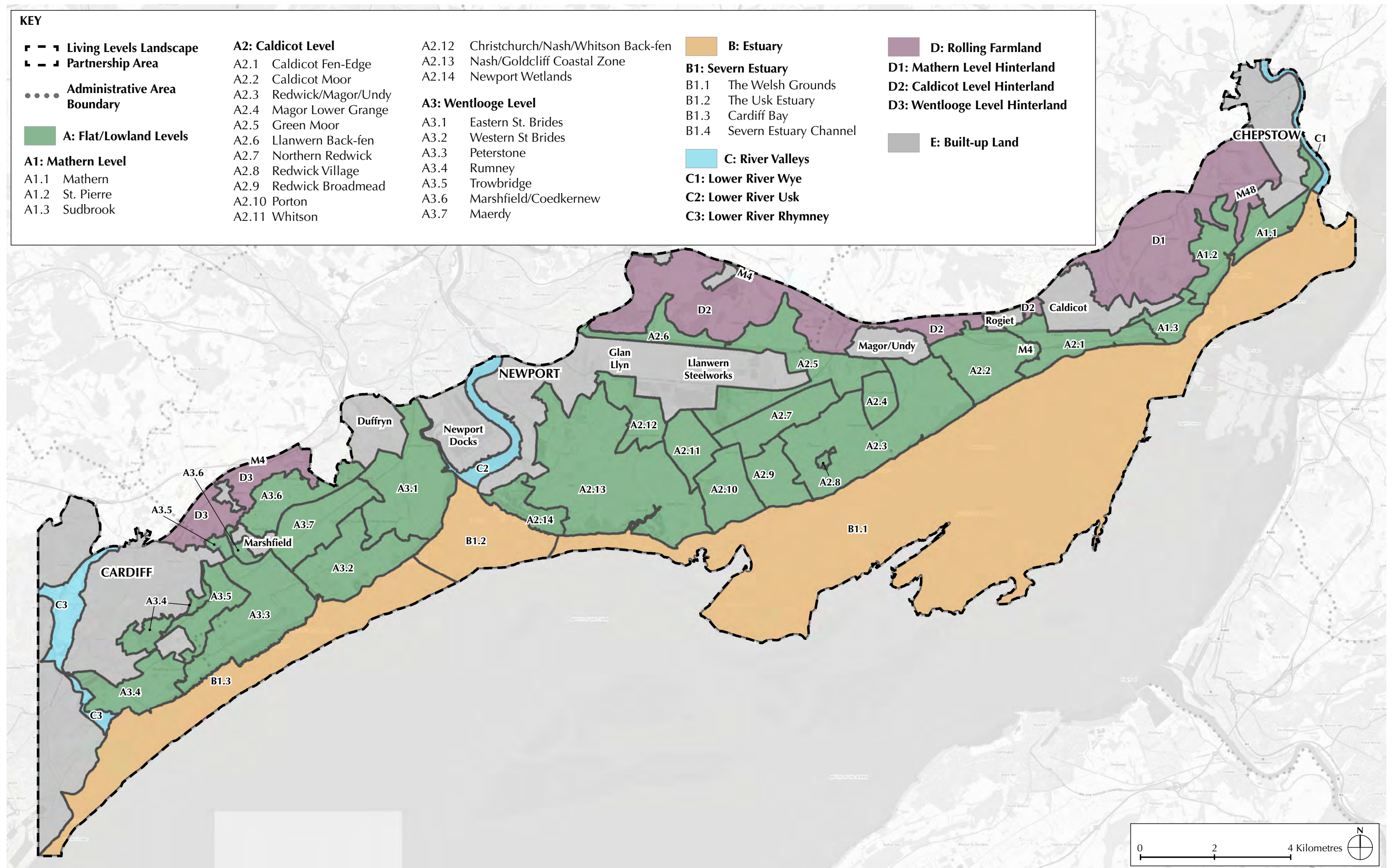
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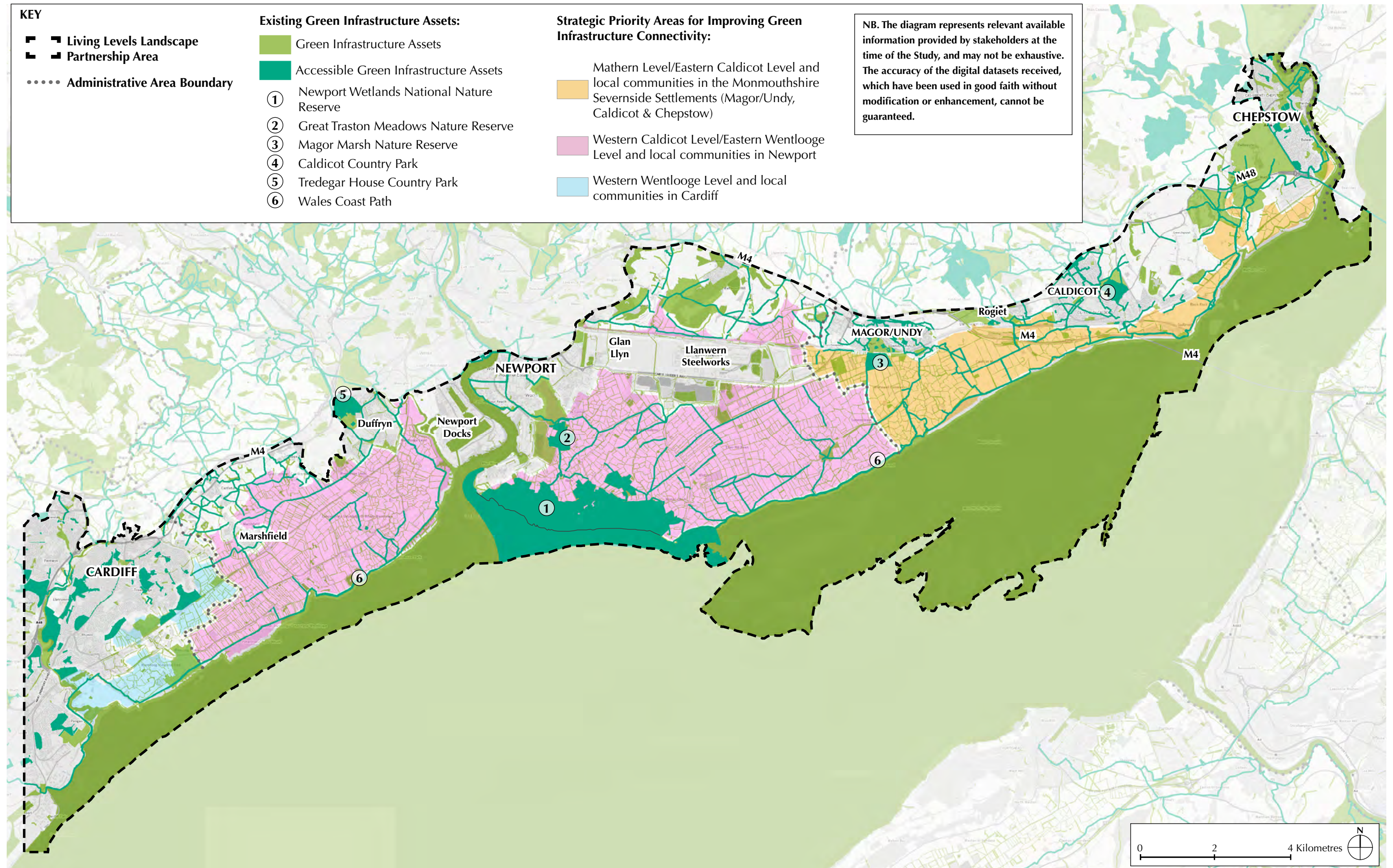
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## APPENDICES

April 2017

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GWENT LEVELS GREEN INFRASTRUCTURE STRATEGY

Chris Blandford Associates

## APPENDIX A

### ECOLOGICAL DESIGNATIONS SUMMARY

As shown on **Figure 3.5**, the majority of the Gwent Levels study area is designated as being of European, national and local nature conservation importance and value. A summary of the special features of these designations is provided below.

#### Gwent Levels SSSIs

Much of the Gwent Levels is covered by six nationally designated Sites of Special Scientific Interest (SSSI). The **Gwent Levels SSSIs** include the Rumney and Peterstone SSSI on the western part of Wentlooge Level; the St Brides SSSI on the eastern part of Wentlooge Level; the Nash and Goldcliff SSSI on the western part of Caldicot Level; the Whitson SSSI and the Redwick and Llandevenny SSSI on the central part of Caldicot Level; and the Magor and Undy SSSI on the eastern part of Caldicot Level.

The special features common to all of the SSSIs are reed and ditch habitat; insects and other aquatic invertebrates; and the shrill carder bee. The reeds and ditches within the Gwent Levels support a wide range of aquatic plants, including many rare or scarce species, which in turn support a wide variety of other wildlife. There is a diverse community of insects and other invertebrates (for example, water beetles) inhabiting the reeds and ditches. The assemblage of water beetles found across the Gwent Levels is unique in Wales and includes the great silver beetle, which is found nowhere else in Wales and is restricted to only a few other sites in southern England. The annually mown ditch banks and rough grassland areas provide habitat for the shrill carder bee, as they contain the flowers preferred by the bee for sources of nectar and pollen, such as red clover, creeping thistle and black knapweed. The reeds and ditches also provide habitat for protected species including otter, water vole, grass snake and amphibians.

In addition to these features, specific interests associated with the individual SSSIs are highlighted below:

- The **Rumney and Peterstone (Gwent Levels) SSSI** on the western part of Wentlooge Level supports a number of important plant species including the nationally rare brackish water-crowfoot *Ranunculus baudotii* and several regional rarities, including the pondweeds *Potamogeton obtusifolius* and *Potamogeton berchtoldii*. The northern section of this SSSI is a stronghold on the Gwent Levels for the flowering rush *Butomus umbellatus*. It also supports a rich and important invertebrate fauna with a number of nationally notable species largely confined to this SSSI including the marsh flies *Pherbellia brunnipes* and *Lamprochromus*

*elegans*, the water beetle *Plateumaris braccata* and the variable damselfly *Coenagrion pulchellum*.

- The reens in the **St Brides (Gwent Levels) SSSI** on the eastern part of Wentlooge Level support a number of interesting plant species most notably thread-leaved water crowfoot *Ranunculus trichophyllus* and small pondweed *Potamogeton berchtoldii*. Reen bank and green lane habitats in this area are also important for relict meadow plant species, such as the regionally notable grass vetchling *Lathyrus nissolia* and common meadow-rue *Thalictrum flavum*. The St Brides SSSI also supports rich invertebrate communities with a number of nationally notable and notable marshland species, e.g. the true fly *Chrysogaster macquarti* and the beetle *Hydaticus transversalis*. It is the only area on the Gwent Levels where the rare fly *Stenomicroa cogani* has been recorded.
- The **Nash and Goldcliff (Gwent Levels) SSSI** on the western part of Caldicot Level is of particular botanical interest as it is the only area in Wales for the least duckweed *Wolffia arrhiza*. There is also an interesting community where two species of hornwort *Ceratophyllum submersum* and *C. demersum* grow together. The invertebrate interest is also high, as rare and notable species such as *Odontomyia ornata*, *Oplodontha viridula* and *Hydaticus transversalis* are present.
- The **Whitson (Gwent Levels) SSSI** on the central part of Caldicot Level is of particular importance for its large number of nationally rare and notable invertebrate species. A total of 65 of these rare invertebrates have been recorded in this area, including *Anthomyza bifasciata*, *Coptophlebia volucris* and *Hydrophilus piceus*. This area is also important for its botanical interest as it contains the nationally rare hairlike pondweed *Potamogeton trichoides* and is the only location in Gwent for the tussock sedge *Carex elata*. Arrowhead *Sagittaria sagittifolia* also grows in abundance in several main reens in this area.
- The **Redwick and Llandeenny (Gwent Levels) SSSI** on the central part of Caldicot Level supports rich assemblages of invertebrate species, including *Chalcis sispes* a parasite of the *Stratiomys* fly larvae, the beetle *Scirtes orbicularis* and the drone fly *Pharhelophilus consimilis*. The SSSI

also contains a number of nationally rare plant species, including the rare *Myriophyllum verticillatum* located in peaty ditches in the northern part of the site and the brackish water crowfoot *Ranunculus baudotii* associated with the ditches bordering the sea wall.

- The **Magor and Undy (Gwent Levels) SSSI** on the eastern part of Caldicot Level supports a total of 43 nationally rare and notable invertebrate species such as the soldier fly *Stratiomys furcata*, the snail killing fly *Pherbellia brunnipes* and the water beetle *Haliphus mucronatus*. This area also supports a number of rare and notable aquatic plant species, including the pondweed *Potamogeton trichoides* and *P. berchtoldii* and the narrow-leaved water plantain *Alisma lanceolatum*. The sea wall back ditch contains brackish water fauna and flora such as the water beetle *Agabus conspersus* and the nationally rare brackish water crowfoot *Ranunculus baudotii*.

## **Severn Estuary European Marine Site**

The Severn Estuary (Môr Mafren) is designated as a European Marine Site, incorporating Special Area for Conservation (SAC), Special Protection Area (SPA) and Ramsar site designations.

The special features of the European Marine Site are the estuary; subtidal sandbanks; intertidal mud and sand; atlantic salt meadow/saltmarshes; reefs; migratory fish (river and sea lamprey, twaite shad, salmon, eel, sea trout and allis shad) and assemblage of fish species; internationally important populations of migratory and wintering bird species; internationally important populations of waterfowl; rocky shores; and freshwater grazing marsh/neutral grassland.

The River Severn is also designated as a SSSI. The special features of the SSSI are the estuarine fauna, which includes invertebrate populations of considerable interest in addition to the internationally important populations of wintering waterfowl and migratory fish. In addition, the estuary fringes, including areas of saltmarsh supporting a range of saltmarsh types, are also special features of the SSSI.

## **River Usk SAC and SSSI**

The River Usk is designated as a SAC and SSSI. Within the study area, the River Usk SAC and SSSI runs through Newport to the confluence with the River Ebbw at Newport where it enters the Severn Estuary.

The special features of the River Usk SAC are the presence of a range of fish species (including sea lamprey, brook lamprey, river lamprey, twaite shad, Atlantic salmon and bullhead) and otter. The citation for the SAC also notes the presence of watercourse habitat (watercourses of plain to montane levels with *Ranunculus fluitans* and *Callitriche-Batrachium* vegetation) and allis shad as qualifying features, although not the primary reason for designation.

The River Usk SSSI citation notes that the river is one of the largest in Wales and that the Lower Usk represents an example of a large lowland river not subject to significant modification. The special features of the SSSI are running water supporting *Ranunculus* vegetation; otter; fish species; and a group of rare crane flies. In addition, the SSSI citation indicates that the invertebrate fauna is characteristic of a large lowland river, with crane flies of particular interest. Scarce higher plant communities at the river's tidal reaches are also of special interest. Although not a special feature of the site, there is a good range of breeding birds associated with the riverine habitats. The SSSI designation includes some areas of adjacent habitat, such as woodland, marshy grassland, stands of tall herb, swamp and fen vegetation, saltmarsh and coastal grassland.

## **Nature Reserves**

### ***Newport Wetlands NNR***

Located on the western edge of Caldicot Level, the Newport Wetlands National Nature Reserve (NNR) is of importance for its bird species. The Newport Wetlands NNR is owned and managed by Natural Resources Wales, apart from the Centre and a small area of land surrounding it which is managed by the Royal Society for the Protection of Birds (RSPB).

The special features of this relatively extensive area of newly created wetlands, constructed as compensatory habitat for the Cardiff Bay Barrage, are its reens and ditches; reedbeds; higher plants; over-wintering birds; breeding birds; and insects and other aquatic invertebrates.

The site supports nationally important numbers of shoveler and black tailed godwit, together with other over wintering species. During summer, the wet grassland, saline lagoons and reedbeds support a variety of breeding birds, including populations of avocet, redshank, lapwing, water rail, Cetti's warbler and bearded tit. The habitats also support a diverse assemblage of aquatic invertebrates and aquatic plants.

Part of the NNR lies within the Gwent Levels (Nash and Goldcliff) SSSI.

### ***Great Traston Meadows Nature Reserve***

The Great Traston Meadows Nature Reserve is located to the north of the Newport Wetlands National Nature Reserve near Pye Corner. It is owned by Eastman and managed by the Gwent Wildlife Trust.

The main habitat is grazing marsh, with associated ditches, reens and grips. Pollarded willows line many of the reens. The site is important for its diversity of wetland and grassland plants, breeding birds and invertebrates.

Much of the reserve lies within the Gwent Levels (Nash and Goldcliff) SSSI.

### ***Magor Marsh Nature Reserve***

Located on the eastern part of Caldicot Level, Magor Marsh Nature Reserve is the largest remnant of the formerly extensive peat fenlands near the Gwent coast. The Magor Marsh Nature Reserve is owned and managed by the Gwent Wildlife Trust.

The special features of this relatively small site are its marshy grassland; neutral grassland; swamp; standing water; and wetland invertebrate assemblage.

The site supports a variety of common reed (*Phragmites australis*), sedge (*Carex* spp.) and submerged and emergent aquatic plants. Areas of wet meadow and both willow (*Salix* spp.) and alder (*Alnus glutinosa*) carr (woodland) with an intersecting system of drainage ditches, reens and ponds are present. The site is an important breeding ground for water and marsh birds.

The Nature Reserve comprises part of the Magor Marsh and Undy SSSI together with two additional blocks of land (Barecroft Common) within the Gwent Levels (Redwick and Llandeenny) SSSI.

### ***Peterstone Wentlooge Marshes Nature Reserve***

Located on Wentlooge Level along the foreshore of the Severn Estuary, the Peterstone Wentlooge Marshes Nature Reserve is owned by Newport City Council and part managed by the Gwent Wildlife Trust's 'Wildlife in Newport Group' (WING).

The special features of this reserve are its tidal mudflats and saltmarsh. During the spring and autumn migration along the west coast of Britain, these coastal habitats support nationally important numbers of waders and it also supports large numbers of overwintering birds. Notable bird species include oystercatcher, curlew, dunlin, redshank, knot, turnstone, grey plover, shelduck, teal, pintail, wigeon, shoveler and avocet.

## Sites of Importance for Nature Conservation

The Gwent Levels includes over 60 local non-statutory Sites of Importance for Nature Conservation (SINCs).

### *SINCs within the Monmouthshire part of the Gwent Levels*

SINC Name	Area (ha)	Habitat(s)
Bowkett Field, Barecroft	2.13	Grassland
Barecroft Fields	4.74	Grassland
Land at Barecroft Common	6.34	Grassland
Blacknall Lane Field	1.12	Grassland
Bridewell Common Field	5.08	Grassland
Caldicot Moor Meadow	1.05	Grassland
Ballan Wood	8.17	Woodland <sup>21</sup>
Sunny Bank	0.99	Woodland
Lavant-well Wood	2.83	Woodland
Mathern Mill	1.34	Grassland
Parc Penterry Meadow	1.37	Grassland
Warren Slade & Park Warren	6.81	Woodland
Bushy Close	4.15	Woodland
Withey Bed	3.70	Woodland
Ruffets	6.30	Woodland
Portskewett Hill North	0.73	Woodland
Portskewett Hill	5.11	Woodland
Farthing Hill	5.02	Woodland
<b>Total area</b>	<b>66.98</b>	

<sup>21</sup> Woodland includes scrub

### *SINCs within the Cardiff part of the Gwent Levels*

SINC Name	Area (ha)	Habitat(s)
River Rhymney	40.72	Wetland <sup>22</sup>
Lamby North	1.95	Saltmarsh
Lamby Salt Marsh	4.61	Saltmarsh
Lamby Way	0.29	Wetland
Wentlooge Industrial Park	0.68	Grassland
Hendre Road	26.19	Wetland
Rumney Great Wharf	59.19	Saltmarsh, Grassland
Hendre Lake West	4.17	Wetland
Hendre Lake	4.79	Wetland
Marshfield	4.98	Unknown
Tyla Farm Wood	2.12	Woodland
<b>Total area</b>	<b>149.69</b>	

<sup>22</sup> Wetland includes rivers, open water and fen, reedbed and swamp

***SINC's within the Newport part of the Gwent Levels***

<b>SINC Name</b>	<b>Area (ha)</b>	<b>Habitat(s)</b>
The Homestead	1.45	Grassland
Sandy Lane Farm Field	0.38	Grassland
Coal Pit Lane Pond	0.08	Wetland
LG Duffryn Site 2	6.71	Grassland
Afon Ebbw River	27.56	Wetland, Grassland, Woodland
Marshall's	10.30	Wetland, Post-industrial, Grassland
Monkey Island	4.16	Post-industrial
Julian's Gout Land	4.56	Grassland
Alpha Steel Site	39.27	Post-industrial
Solutia Site	63.63	Unknown
Former Steel Works Site off Queensway Meadow	6.74	Post-industrial
Ringland Way Marsh	2.95	Wetland
Hartridge Wood	7.58	Woodland
Hartridge Fields	19.10	Grassland
Dockwell Wood	10.25	Woodland

<b>SINC Name</b>	<b>Area (ha)</b>	<b>Habitat(s)</b>
Monk's Ditch	1.11	Wetland
Coed Rhedyn/Scotch Wood	13.09	Woodland
Delbury Grasslands	4.22	Grassland
Stock Wood (East and West)	7.07	Woodland
Underwood Field	7.65	Grassland
Pamt Yr Eos Wood	6.81	Woodland
The Routes Wood	10.30	Woodland
Craig-Y-Perthi Field North	6.95	Grassland
Craig-Y-Perthi Field South	3.94	Grassland
Craig-Y-Perthi Wood	2.56	Woodland
Ridings Wood	3.92	Woodland
Wilcrick Fort West	3.39	Grassland
Greenmoor Pool	2.84	Wetland
Spencer Works 3	2.86	Grassland
Elver Pill Reen Grassland & Pond	7.70	Wetland, Post-industrial, Grassland
<b>Total area</b>	<b>289.13</b>	

## APPENDIX B POLICY CONTEXT

### European Landscape Convention

The European Landscape Convention (ELC), to which the UK is a signatory, provides the setting for general landscape policy in Europe and aims ‘to promote landscape protection, management and planning’ (Council of Europe, 2004). The ELC recognises that sustainable development can only be achieved if social and economic needs have a ‘balanced and harmonious relationship’ with the environment.

### EU 2020 Biodiversity Strategy

The European Commission has recently adopted a strategy for enhancing Europe’s natural capital which seeks to ‘promote the deployment of Green Infrastructure in the EU in urban and rural areas’ by integrating principles that protect and enhance nature and natural processes into planning and development (European Commission, 2013). The strategy is identified as a key step for the implementation of the **EU 2020 Biodiversity Strategy**, which was endorsed by the UK in June 2011. The Biodiversity strategy requires that ‘by 2020, ecosystems and their services are maintained and enhanced by establishing Green Infrastructure and restoring at least 15% of degraded ecosystems’. The Commission recognises the benefits which nature provides, such as food, water, air, climate regulation, flood prevention, materials and recreation.

### Well-being of Future Generations (Wales) Act 2015

The Well-being of Future Generations (Wales) Act 2015 requires public bodies in Wales to improve the economic, social, environmental and cultural well-being of Wales in accordance with the principle of sustainable development. This means seeking to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs. In applying the sustainable development principle, public bodies need to demonstrate that they have used the following five “ways of working”:

- **Integration** – demonstrating a joined up approach to communities and people, the economy, the environment and culture.
- **Long-term thinking** – balancing current and long-term needs.
- **Prevention** – taking action now to prevent problems in the future
- **Collaboration** – working with others to meet our objectives
- **Involvement** – involving the people affected by our actions.

The Act also requires public bodies to demonstrate that they have contributed to the following “well-being 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 peoples 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.

### **Environment (Wales) Act 2016**

The Environment (Wales) Act 2016 provides the legislative framework for managing Wales' natural resources for the benefit of future generations. In particular, the Act sets out measures that promote a joined-up approach to managing natural resources in a sustainable way; confirm Natural Resources Wales' functions and duties; and deliver improvements in efficiency of natural resource use.

### **Planning Policy Wales**

Planning Policy Wales (Edition 9, November 2016) sets out the Welsh Government's national land use planning policies that should be taken into account when preparing development plans. Chapter 5 of PPW sets out the Welsh Government's objectives for the conservation and improvement of Wales' natural heritage. The PPW recognises that a key role of the planning system is to ensure that society's land requirements are met in ways which do not impose unnecessary constraints on development whilst ensuring that all reasonable steps are taken to safeguard or enhance the environment. Chapter 6 of PPW sets out the Welsh Government's objectives for the protection, management and conservation of the special interest of sites on the register of historic landscapes in Wales.

### **Planning Policy Wales - Technical Advice Notes**

The PPW is supplemented by a series of Technical Advice Notes (TANs), which provide guidance from the Welsh Government on how specific issues should be addressed through the planning process. Of particular relevance to GI are **TAN12 (Design)**, **TAN 5 (Nature Conservation)**, and **TAN 16 (Sport, Recreation & Open Space)**.

## **Monmouthshire Local Development Plan**

The Monmouthshire Local Development Plan 2011–2021 (Adopted February 2014) includes a Strategic Policy and Development Management Policy that relate to GI.

### **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.**
- 1. MAINTAIN, PROTECT AND ENHANCE THE INTEGRITY AND CONNECTIVITY OF MONMOUTHSHIRE'S GREEN INFRASTRUCTURE NETWORK.**
- 2. 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.**

5.100 Green infrastructure assets are numerous and include parks, open spaces, playing fields, trees/ woodlands, hedgerows, allotments, biological and geological conservation sites, landscape and heritage features, water courses, cycleways, bridleways, public rights of way and open access land.

5.101 Development proposals will be expected to maintain, enhance and create new green infrastructure, where appropriate. Green infrastructure should be planned in a way to integrate with existing Rights of Way, pedestrian and cycle routes. Where necessary, planning obligations will be sought in accordance with Policy S7.

5.102 This aspect of Policy S13 will be supported by SPG on green infrastructure which will be prepared to provide advice on the implementation of the policy. The aim is to create a strategically planned and delivered network of green spaces and other environmental features. This network should be designed and managed as a multifunctional resource capable of delivering a wide range of environmental and quality of life benefits for local communities. Monmouthshire contains a wealth of high quality green infrastructure assets, all of which provide a range of social, economic and environmental benefits that include:

- Protecting and enhancing biodiversity;
- Mitigating and adapting to the impacts of climate change;
- Improving health and well-being (encouraging people to walk or cycle short journeys);
- Encouraging sports and recreation;
- Improving townscape, landscape quality and visual amenity.

5.103 The LDP has also been informed by a Greenspace Study which assessed the location, quality, quantity and connectivity of greenspace for the main settlements in the County, together with the accessibility of these areas to local people.

5.104 The information within the SPG and the study should be used to assist in the implementation of criterion 2 of Policy S13, in order to ensure that County's green infrastructure is maintained, protected, enhanced and, where appropriate, created and expanded.

#### **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.**

6.3.50 Green infrastructure comprises natural and managed green spaces and other environmental features within urban and rural settings which provide benefits for the economy, local people and biodiversity. This policy seeks to ensure that development proposals maintain, protect and create new green infrastructure, where appropriate.

6.3.51 Green infrastructure should be planned in a way to integrate with existing Rights of Way, pedestrian and cycle routes. Where necessary, planning obligations will be sought to facilitate enhanced and/ or new green infrastructure assets in accordance with Policy S7. Policy DES2 Areas of Amenity Importance specifically applies to the protection and enhancement of existing green space within the built and natural environment and should be considered alongside Policy GI1.

6.3.52 This policy will be supported by SPG on green infrastructure which will be prepared to provide advice on its implementation. The LDP has also been informed by a Greenspace Study which assessed the location, quality, quantity and connectivity of greenspace for the main settlements in the County, together with the accessibility of these areas to local people.

#### **Monmouthshire Green Infrastructure SPG**

The Monmouthshire Green Infrastructure Supplementary Planning Guidance (SPG) supports implementation of Strategic Policy S13 and Development Management Policy GI1. Prepared by Chris Blandford Associates, the SPG was adopted by Monmouthshire County Council in April 2015.

## **Newport Local Development Plan**

The Newport Local Development Plan 2011–26 (Adopted January 2015) includes an Environment Policy that relates to GI.

### **POLICY CE3 (ENVIRONMENTAL SPACES AND CORRIDORS)**

**IN AND ADJOINING THE URBAN AND VILLAGE AREAS, AND IN AREAS IDENTIFIED FOR COMPREHENSIVE DEVELOPMENT, SITES HAVING EXISTING IMPORTANCE FOR THEIR VISUAL QUALITIES, AS WILDLIFE HABITATS OR FOR RECREATIONAL OR AMENITY PURPOSES, WILL BE SAFEGUARDED AS “ENVIRONMENTAL SPACES AND CORRIDORS”. DEVELOPMENT IN THESE SPACES WILL BE PERMITTED ONLY WHERE:**

- i) THE EXISTING OR POTENTIAL ENVIRONMENTAL QUALITIES OF THE SITE WILL BE IMPROVED OR COMPLEMENTED;**
- ii) THERE IS NO ADVERSE IMPACT ON INTERNATIONAL, EUROPEAN, NATIONAL, REGIONAL OR LOCAL NATURE CONSERVATION INTEREST;**
- iii) THERE IS NOT A LOSS, WITHOUT APPROPRIATE REPLACEMENT, OF A RECREATIONAL, OPEN SPACE, OR AMENITY RESOURCE FOR THE IMMEDIATE LOCALITY UNLESS IT CAN BE DEMONSTRATED THAT THERE IS AN EXCESS OF PROVISION OR FACILITIES CAN BE ENHANCED THROUGH DEVELOPMENT OF A SMALL PART OF THE SITE.**

**PROPOSALS TO ENHANCE OR IMPROVE EXISTING ENVIRONMENTAL SPACE PROVISION WILL BE ENCOURAGED WHERE PRACTICABLE. ADDITIONAL PROVISION WILL BE SOUGHT IN AREAS WHERE A DEFICIT HAS BEEN IDENTIFIED.**

4.7 Environmental Spaces and corridors form a valuable part of Newport’s green infrastructure provision. They provide a network of connected, accessible, multifunctional sites including parks, woodland, informal open spaces, amenity areas, footpaths and bridleways, hedgerows, commons and village greens, and nature reserves as well as linkages such as river corridors, wildlife corridors and the Monmouthshire & Brecon Canal, that can bring about multiple social, health, economic and environmental benefits to the area. The sites are multi-functional in that apart from their ecological value they can be used for various purposes, for example, leisure activities and promoting tourism with associated benefits in terms of health and the economy.

4.8 Environmental Spaces are predominantly located within the settlement boundary, however, there are a number located outside the settlement boundary and/or on land with other designations. The Environmental Space allocation adds an additional layer of protection to such sites, it does not replace them. All policy designations and associated Policies relating to a site will be considered in the determination of proposals that come forward on Environmental Spaces. Proposals will also be considered against other relevant Policies of the Plan, including the GP Policies.

4.9 Where possible these spaces are defined on the Proposals Map. However, this should not be viewed as a definitive list as there may be other green spaces that are important to the local community for the reasons set out above that have not been identified through the Local Development Plan process. Background Paper – Environmental Spaces sets out the process used to identify the Environmental Spaces.

4.10 A number of Environmental Spaces have also been identified as urban ‘quiet areas’ in the preparation of a Noise Action Plan. Such areas are protected against an increase in noise generated from development proposed on the site or nearby. Further details on the Noise Action Plan and quiet areas are set out in Chapter 13 of PPW and Policy GP7: Environmental Protection and Public Health.

4.11 One of the reasons for allocating many of the Environmental Spaces is their recreational value. Some sites will also therefore be protected under Policy CF1 – Protection of Playing Fields, Land and Buildings used for Leisure, Sport, Recreation and Play. These sites can be viewed in the Council's Assessment of Outdoor Play Space Provision.

4.12 To safeguard green infrastructure resources Environmental Spaces should be protected from severance as the value of isolated areas is much less in wildlife and amenity terms than if the areas are linked. Further information will be provided in Supplementary Planning Guidance on Wildlife and Development.

4.13 Through masterplanning processes incorporated within the Design and Access Statement, opportunities could exist to safeguard existing open features and to create new areas for amenity, nature conservation and recreation provision within key development sites. Opportunities may also arise to enhance existing provision, either through specific improvement schemes or through the redevelopment of neighbouring or nearby land. An Environmental Space master plan approach will be taken to the Pillgwenlly playing fields following consultation with the local community.

4.14 Natural Resources Wales (NRW) has developed a toolkit to help ensure everyone in Wales has access to natural greenspace. In accordance with NRW's guidance, an assessment of accessible natural greenspace has been undertaken. This analysis together with the Assessment of Outdoor Play Space and other related documents, such as the Local Biodiversity Action Plan will be used to help inform decisions relating to opportunities to increase or enhance existing levels of provision. This could be achieved through design measures such as improved access points and link routes into an existing site or enhanced landscape and environmental improvements, such as tree planting. Additional provision will be sought on new development sites, where there are known deficiencies in an area.

4.15 Proposals for local food/plant production, in the form of community gardens, on Environmental Spaces will be supported provided that they link with other relevant Council Policies and that the proposal would enhance the social amenities and economic well being of the neighbourhood and will be used by nearby residents. Furthermore, in order to safeguard the continued value of the land to the community, it will be important to work with the Council's Streetscene Service Area in determining whether the natural and physical characteristics of the site are conducive to successful community gardening.

## **Cardiff Local Development Plan**

The Cardiff Local Development Plan 2006–2026 (Adopted January 2016) includes a Key Policy that relates to GI.

### **POLICY KP16 (GREEN INFRASTRUCTURE)**

**CARDIFF'S DISTINCTIVE NATURAL HERITAGE PROVIDES A NETWORK OF GREEN INFRASTRUCTURE WHICH WILL BE PROTECTED, ENHANCED, CREATED AND MANAGED TO ENSURE THE INTEGRITY AND CONNECTIVITY OF THIS MULTI-FUNCTIONAL GREEN RESOURCE IS MAINTAINED.**

**PROTECTION AND CONSERVATION OF NATURAL HERITAGE NETWORK NEEDS TO BE RECONCILED WITH THE BENEFITS OF DEVELOPMENT. PROPOSED DEVELOPMENT SHOULD THEREFORE DEMONSTRATE HOW GREEN INFRASTRUCTURE HAS BEEN CONSIDERED AND INTEGRATED INTO THE PROPOSALS. IF DEVELOPMENT RESULTS IN OVERALL LOSS OF GREEN INFRASTRUCTURE, APPROPRIATE COMPENSATION WILL BE REQUIRED.**

**NATURAL HERITAGE ASSETS ARE KEY TO CARDIFF'S CHARACTER, VALUE, DISTINCTIVENESS AND SENSE OF PLACE. THEY INCLUDE THE CITY'S:**

- I. UNDEVELOPED COUNTRYSIDE AND COASTLINE (EN1 AND EN2);**
- II. LANDSCAPE, GEOLOGICAL AND HERITAGE FEATURES WHICH CONTRIBUTE TO THE CITY'S SETTING (EN3);**
- III. STRATEGICALLY IMPORTANT RIVER VALLEYS OF THE ELY, TAFF, NANT FAWR AND RHYMNEY (EN4);**
- IV. BIODIVERSITY INTERESTS INCLUDING DESIGNATED SITES AND THE CONNECTIVITY OF PRIORITY HABITATS AND SPECIES (EN5, EN6 AND EN7);**
- V. TREES (INCLUDING STREET TREES), WOODLANDS AND HEDGEROWS (EN8);**

- VI. STRATEGIC RECREATIONAL ROUTES, CYCLEWAYS AND THE PUBLIC RIGHTS OF WAY NETWORK (T5, T6 AND T8);**
- VII. PARKS, PLAYING FIELDS, GREEN PLAY AREAS AND OPEN SPACES (C4 AND C5); AND**
- VIII. GROWING SPACES INCLUDING ALLOTMENTS, COMMUNITY ORCHARDS AND LARGER GARDENS; AND**
- IX. HOLISTIC INTEGRATED SURFACE WATER MANAGEMENT SYSTEMS (EN10).**

4.173. The policy aims to ensure that Cardiff's green infrastructure assets are strategically planned and delivered through a green infrastructure network. Other policies in the Plan provide more detailed guidance on aspects of these assets, together with supporting SPG.

4.174. The green infrastructure network is important for its own sake and for its contribution to the wider quality of life, including the value that people attach to it. It provides a range of economic, social and environmental benefits including reducing impacts of climate change (KP15), enhanced biodiversity habitat and species connectivity (EN5, EN6 and EN7), providing greater opportunities for sports and recreation (C4), contributing to the communities' health and wellbeing (C6) and providing visual benefits for all (KP5).

4.175. Where development is permitted, planning conditions and/or obligations will be used to protect or enhance the natural heritage network. New developments should incorporate new and / or enhanced green infrastructure of an appropriate size, type and standard to ensure no fragmentation or loss of connectivity.

4.176. Where the benefits of development outweigh the conservation interest, mitigation and/or compensation measures will be required to offset adverse effects and appropriate planning obligations sought. The implementation of policies designed to provide and protect public open space throughout Cardiff would also serve to offset any increase in recreational pressure on the Cardiff Beech Woods SAC, thereby helping to avoid likely significant effect upon that site.

*4.177. Management of Cardiff's green infrastructure network should be in place prior to development, and appropriate planning obligations sought. SPC on this topic will more fully outline the extent of Cardiff's green infrastructure and how this policy can be implemented in more detail.*



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**South East Studio** The Old Crown High Street Blackboys Uckfield East Sussex TN22 5JR T 01825 891071 E [mail@cbastudios.com](mailto:mail@cbastudios.com) W [www.cbastudios.com](http://www.cbastudios.com)

**London Studio** Woolyard 52 Bermondsey Street London SE1 3UD T 020 7089 6480

**Director** D Watkins BSc MSc MRTPI

**Senior Consultant** C.J Blandford BA DipLD MLA FLI

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