



DRAFT COUNTY
DEVELOPMENT
PLAN **2016-2022**

*Appendix 14
dlr Green Infrastructure Strategy*

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Cover Photo: Kilbogget Park.

In 2014, the Strategy Team was appointed by Dún Laoghaire-Rathdown County Council to prepare a Green Infrastructure Strategy for the County.

In the preparation of this strategy the role of the various specialist consultants was as follows:

- JBA Consulting** - Water and Environmental Consultants. Responsible for Strategy, Funding and Water Management
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Photo 2: Honeypark, Glenageary.

Green Infrastructure Glossary

Accessibility Connections - Recreational Access Routes, Rights of Way, Greenways, the Dublin Mountains Way, Wicklow Way and parts of the Cycle Network all contribute to accessibility connections.

Asset - Green Infrastructure that is delivering a function or functions in an area of identified need. For example, woodland that is intercepting and storing water in an area of flood risk is a water management asset; it is providing functions that help to reduce the risk of flooding.

Barriers – Barriers to fully connected Green Infrastructure hubs and corridors can be found at different spatial scales. These include crossings of major and local roads and transport infrastructure and urban development.

Benefits - Green Infrastructure planning is set firmly in the context of public benefit. There are many ways of identifying and categorising benefits.

Corridor – Existing and proposed connections between hubs which provide multi-functional benefits are defined as Green Infrastructure corridors. The corridors are Green Infrastructure assets as well as strategic connections between hubs. A Green Infrastructure corridor may contain connections for recreation, sustainable transport, water, biodiversity and habitat. Recreational Access Routes, Rights of Way, Greenways, the Dublin Mountains Way, Wicklow Way and parts of the Cycle Network all contribute to the network of Green Infrastructure corridors.

Greenway - ‘Shared-use routes for non-motorised users, (walkers, cyclists, roller skaters, horse riders) for pleasure, recreation, tourism and daily journeys’. They are generally routes which predominantly utilise established green spaces but can also cross, and link to, public roads. Greenways provide and expand recreational opportunities for walking, jogging and cycling and can often coincide with river/stream corridors and can promote free passage for wildlife. Greenways are a key component of the GI network.

Green Infrastructure - ‘A generic term encompassing the protection, management and enhancement of urban, periurban and rural environmental resources (natural and managed) through the identification and provision of multifunctional and interconnected green spaces and provides an opportunity to reassess the manner in which we manage and use our green spaces’. The Planning Regional Guidelines for the Greater Dublin Region (2010 - 2022).

Green Streets – A Green Infrastructure asset located in the streetscape either within or directly connected to road and pavement surface. The principal purpose of a green street is to provide stormwater management through SuDS features to reduce the rate and volume of runoff from streets that enters storm drainage systems. To provide multi-functional benefits Green Streets also offer shading, create small scale habitats, provide local recreation, aesthetic improvements and opportunities for safer cycling and walking.

Hub – Existing and proposed Green Infrastructure assets are defined as ‘hubs’ where they are important strategic locations for the Green Infrastructure strategy. Regional parks which provide multifunctional benefits, such as Marlay Park, are examples of hubs.

Multifunctionality - One of the strengths of a Green Infrastructure approach is that it can be used to deliver several functions from a single intervention. For example, the opportunity to expand a key habitat may also provide an opportunity to improve water management, improve image and capture air borne pollution. Often, because the wider functions are not considered, the opportunities to get more value from an intervention are not taken.

SuDS – Sustainable Drainage Systems (SuDS) are a sequence of conveyance systems and control structures designed to manage the drainage of surface water more sustainably than conventional techniques by providing treatment and reducing flow rates and volumes. The term Sustainable Urban Drainage Systems (SUDS) is frequently used in Dún Laoghaire-Rathdown planning policies and guidance. For the Green Infrastructure Strategy the term, Sustainable Drainage Systems (SuDS) will be used. This subtle change allows sustainable drainage in rural areas to be incorporated into plans, policies and guidance.

Executive Summary

This Green Infrastructure (GI) strategy for Dún Laoghaire-Rathdown seeks to provide a vision and a framework which will identify, protect, promote and enhance the GI assets in the urban, rural and coastal environments of the County. The strategy provides a vision for the GI in the County that is supported by a set of key principles and a robust spatial framework. Importantly, the GI strategy aims to guide key aspects of planning policy and County and local level.

The benefits of GI are many and include; improving health and well-being through new and improved recreation and better local walking and cycling connections, enhancing social cohesion, protecting, managing and enhancing biodiversity, reinforcing sense of place, and improving water quality and management. GI also provides many potential economic benefits through enhanced opportunities for tourism and local business activities.

Existing Green Infrastructure

The existing Green Infrastructure in Dún Laoghaire-Rathdown is considerable. The County boasts many key features and activities along the coast and across the urban, rural and upland areas. Many of these are iconic in nature, including the varied and dramatic coastline itself, Killiney and Dalkey Hills, the Dublin Mountains, the numerous rivers and streams and the parks and open spaces of County and regional significance.

Three Themes

In this strategy the endowment and deficits in these features or assets are considered alongside activities under the broad themes of accessibility, recreation and health and well-being, natural and cultural heritage and water management. The Green Infrastructure strategy is based on the overlapping of these broad themes of GI.

Accessibility, Recreation, Health and Well-Being

Accessibility, recreation and health and well-being, is concerned with the nature, quality and continuity of connections of the GI (such as Greenways, walking routes and public transport corridors) and the ease of access to open spaces, greenways and recreational resources and issues, such as landscape character and views, and the range, nature and frequency of activities that take place in key amenities and attractions. **The main objectives of the strategy for accessibility, recreation and health and well-being are to:**

- Develop public parks at the threshold of urban and rural areas into 'Gateway parks'
- Improve sections of the Wicklow Way and Dublin Mountains Way where they occur along stretches of road
- Create new and improved connections between open spaces to generate a network of spaces across the urban areas
- Improve links within urban areas to encourage day-to-day use

- Improve links across transport infrastructure where there are barriers to movement
- Improve pedestrian and cycle links across railway barriers
- Improve links to the Green Infrastructure network from public transport
- Address the uneven distribution of allotments or community gardens

Natural and Cultural Heritage

Natural and cultural heritage is concerned with the range of natural and man-made assets of heritage value in the County. These include areas of importance for biodiversity, such as watercourses, woodlands, and coastline, and cultural assets such as important monuments, buildings and landscapes, as well as less tangible cultural heritage such as arts and sciences. **The main elements of the strategy for natural and cultural heritage are to:**

- Review and/or complete Landscape Character Assessments and Historic Landscape Character Assessments
- Complete Habitat Assessments and implement the County Tree Strategy
- Restore or mitigate the fragmentation of ecological corridors throughout the County
- Create a network of Greenways, Green Streets, including green roofs
- Harness the strong built heritage of the County
- Harness the strong cultural heritage of the County
- Ensure new developments enhance the Green Infrastructure network

Water Management

Water management is based on the role and potential of the Green Infrastructure to better manage surface and flood water and to contribute to maintaining and improving the quality of water in the County. **The main elements of the strategy for water management are to:**

- Utilise rivers and streams as one of the natural foundations for multi-functional GI corridors
- Use GI features to reduce impacts when drainage systems are exceeded
- Reduce the rate, volume, and improve the quality of surface water runoff
- Manage runoff at source by creating storage ponds and wetlands
- Promote local sustainable urban drainage systems (SuDS), 'Green Streets' and green roofs
- Enable SuDS to be located in the public realm
- Encourage the use of water to generate energy on a micro level

Spatial Framework

A key element of any Green Infrastructure strategy is the spatial framework. It provides an understandable structure on which priorities and actions can be based. The framework spans the short to long-term time horizons and it distinguishes between the GI framework that is already in place in Dún Laoghaire-Rathdown, and that which is emerging or to be developed over the coming years. **The key elements of the spatial framework for GI in Dún Laoghaire-Rathdown are:**

- A higher level, countywide network of integrated elements, which connects to surrounding and Regional GI networks
- A structure for integrating the rich network of local-level GI in Dún Laoghaire-Rathdown
- A network of six, overlapping and multi-functional GI corridors, connecting higher-level GI hubs and the main elements of the mountains, the urban area and the coast
- Integration of important regional GI corridors, such as the coast, Dublin Mountains Way and Wicklow Way
- A 'chain' of improved 'gateway hubs' (parks and open spaces), which provide the transition between the mountains and the urban area

Delivery

A robust approach to delivery is essential for a strategy to succeed. Dún Laoghaire-Rathdown County Council have set out in this strategy a vision for GI in the County and the Council can provide significant policy leadership and influence on the form of new development and the maintenance of many of the green assets. This role can be enhanced by partnerships with communities and across County boundaries. **The strategy makes key recommendations in the area of delivery, including:**

- The setting up of a cross-disciplinary and departmental working group in Dún Laoghaire-Rathdown County Council
- Preparation of a delivery plan, including roles, responsibilities, priorities and timelines
- Key recommendations for policy in the areas of accessibility, recreation and health and well-being, natural and cultural heritage and water management
- Exploration of local and external funding and investment opportunities for GI
- Development and use of tools for integrating GI into current planning practice
- Priority for key actions
- Ongoing monitoring and review of the delivery process.







Photo 3: Dublin Mountains Way. Source: Wikipedia. Image by Joe King.

1. Introduction

1.1 General

This Green Infrastructure (GI) strategy for Dún Laoghaire-Rathdown seeks to provide a vision and a framework which will protect, promote and extend the GI assets (the network of green spaces, habitats and ecosystems of Dún Laoghaire-Rathdown).

The strategy is based on key evidence and analysis of the components that can form Green Infrastructure and it supports a plan led approach to planning and sustainable development in Dún Laoghaire-Rathdown.

...a generic term encompassing the protection, management and enhancement of urban, peri-urban and rural environmental resources...

The 'Regional Planning Guidelines for the Greater Dublin Area, 2010-2022', provide the following definition of Green Infrastructure as '*...a generic term encompassing the protection, management and enhancement of urban, peri-urban and rural environmental resources (natural and managed) through the identification and provision of multi-functional and interconnected green spaces and provides an opportunity to reassess the manner in which we manage and use our green spaces.*' The GI exists in many different contexts, both urban and rural (Urban Forum and IEEM, 2011) and it has a spatial component that is characterised by an interconnected network of green spaces (Comhar, 2010), with benefits for natural ecosystems and communities.

Green Infrastructure is a relatively recent concept in planning for sustainable urban and rural areas in Ireland. It provides a framework within which the relationships between the network of green spaces, habitats and ecosystems can be considered within a defined geographic area. GI has both spatial and operational dimensions and there are strong synergies between GI and other systems, such as transport and infrastructure engineering. As such GI can make important contributions to local transport and accessibility, through its promotion of pedestrian and cycling infrastructure and the sustainable management of urban water, through a more integrated approach to managing watercourses and water bodies.

1.2 Background and Purpose

Dún Laoghaire-Rathdown has a remarkable range of natural and cultural assets. In some cases these could be described as 'iconic' (e.g. Dalkey Islands, Killiney Hill, Booterstown Marsh, Marlay Park). The County has a current population of 207,000 people and it covers



Photo 4: Cabinteely Park.

The County has a current population of 207,000 people and it covers an area of about 126 square kilometres. The County has some 17 kilometres of varied and spectacular coastline.

an area of about 126 square kilometres. The County has some 17 kilometres of varied and spectacular coastline. The urban condition in the County is varied too, with towns and villages embedded in extensive suburbs (approximately 54% of the County could be described as urban in nature). Expansive agricultural lands meet the suburban edge and upland areas of outstanding natural beauty provide a promontory over the city and a gateway to the Wicklow Mountains. The natural and cultural heritage of the County, while remarkable, is poorly connected in some locations. While this is a current weakness in the existing GI of the County, it could also be a major opportunity for the future.

This first Green Infrastructure strategy for Dún Laoghaire-Rathdown aims to secure a multi-functional, high quality GI for the County by:

- Providing a better understanding of the parts and functions of GI and their interactions
- Presenting a clear vision
- Framing an integrated spatial strategy

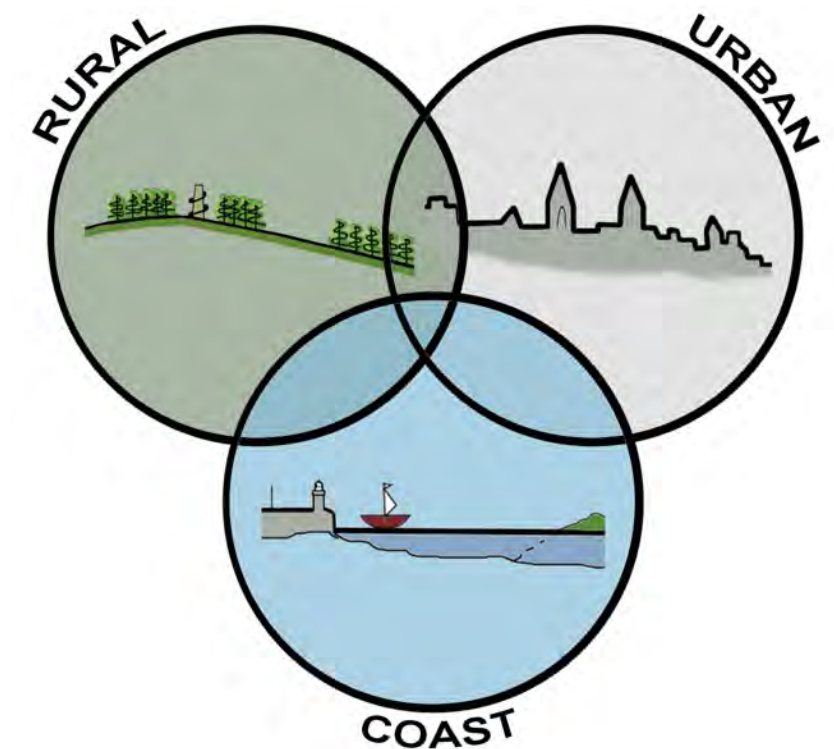


Figure 1.A: County Character Zones Venn Diagram.

Significantly, the Dún Laoghaire-Rathdown County Development Plan 2010-2016 recognises the important role of Green Infrastructure in the planning and development of the County and calls for the preparation of an integrated strategy.

In commissioning this strategy the Council aimed *'...to produce a comprehensive, interactive and highly flexible strategy for a range of purposes specifically within Dlr, whilst acknowledging the County's regional position within the Greater Dublin Area (GDA).'* A multi-disciplinary approach to match the multi-faceted nature of GI was required within a set of clear objectives which included a providing a better understanding of the GI in the County, optimising its use, identifying key elements of a new GI structure, identifying opportunities for protecting and enhancing biodiversity, enhancing the function and quality of watercourse and providing new accessibility and permeability. The brief also required a structured plan that could serve as a tool for delivery and a means to establish the value and viability of GI for the County.

1.3 Green Infrastructure and its Benefits

From a planning point of view, Green Infrastructure provides an integrated approach by linking land-use, landscape, services, ecology, heritage and transportation. The GI approach assists in meeting statutory obligations under EU directives and national legislation, such as the Water Framework Directive, Strategic Environmental Assessment (SEA) and Birds and Habitats Directives (particularly under Articles 6 and 10). GI can also be a mechanism for identifying mitigation and compensatory measures required under Article 6 of the Habitats Directive.

Green Infrastructure provides a broad range of invaluable ecosystem services and multiple social and economic benefits including:

- Biodiversity management and enhancement
- Water management including drainage and flood attenuation, filtration and pollution control
- Recreation and tourism
- Visual amenity and sense of place
- Sustainable mobility
- Food, timber and other primary production
- Regulation of micro-climates and heat islands
- Climate change adaptation
- Reduction in carbon footprint
- Health and well-being
- Local distinctiveness
- Education
- Assisting in regulatory compliance

1.4 Vision and Principles

The vision for Dún Laoghaire-Rathdown is to create a network of green hubs and corridors that utilise and extend existing and proposed open space and movement assets. This will be delivered based on a spatial framework that will realise the multi-functional benefits of GI and promote the well-being of all those who live, work in and visit the County.

The vision is underpinned by 11 principles that in turn guide the Green Infrastructure strategy. The strategy also sets out how it will be enabled using the various Council functions and, in particular, the planning and development processes. The principles for GI in Dún Laoghaire-Rathdown are set out below.

Green Infrastructure Principles for Dún Laoghaire-Rathdown

- **Prioritise the protection and enhancement of biodiversity and natural heritage**
- **Enhance community awareness and appreciation of the natural and cultural heritage**
- **Contribute to the health and sense of well-being of the community**
- **Play a key role in shaping and improving local character and sense of place**
- **Contribute to the sustainable management of surface water run-off and quality, and deliver a holistic approach to flood risk management**
- **Deliver good levels of access to, and connections between, the coast, the urban area and the mountain/upland**
- **Connect to existing and planned, regional and local level GI in surrounding counties**
- **Protect and enhance the multi-functional roles and benefits of existing green and open space assets and promote sustainable links between them**
- **Enable good connections to strategic and high quality public transport**
- **Contribute to reducing carbon emissions and adapting to the impacts of climate change**
- **Support the production of local food and sustainable energy**

1.5 Scope of Strategy

On a County-wide level, the approach to Green Infrastructure must be strategic or 'big picture' in nature. This strategy does not explore site-specific or local issues or GI elements. It must find the proper balance between more general and more detailed considerations and it must focus on providing a robust and integrated strategy, which is nested within the regional and surrounding GI, and provides a clear framework for local GI strategies to be developed.

The timescales considered extended beyond the forthcoming County Development Plan in order to deliver an aspirational vision of how Green Infrastructure can influence place making. The core elements of the strategy are time bound to the Development Plan period 2016-2022.

1.6 Strategy Themes

As the range of ecosystem services deriving from Green Infrastructure can be quite extensive, it is common to group these considerations into themes and to consider them as overlapping strands. From an initial consideration of issues and assets, this strategy considered three key themes:

1. Accessibility, recreation, health and well-being
2. Natural and cultural heritage
3. Water management

These themes provide a framework under which the complexities of Green Infrastructure can be more easily understood. They also provide a basis for policy and spatial strategy. In this strategy these three themes are integrated within a spatial strategy for GI in the County that is based on:

- Vision and principles (derived from current literature, analysis, workshops and consultation)
- 'Big connections' with GI in the surrounding counties and the region
- An integrated urban and landscape strategy for GI

The Green Infrastructure strategy is overarching and is referenced in a number of the relevant strategies in the forthcoming County Development Plan.



1.7 Process and Method

The Green Infrastructure strategy was prepared on the basis of recommended work stages (Comhar, 2010) as follows:

- Process planning, which included appointment of consultants, establishment of a multi-disciplinary steering group within the County Council, agreeing a shared vision and identifying specific, achievable, measurable, outcome-based objectives and actions;
- Mapping and analysis, which included gathering and layering of baseline information and conducting spatial analysis using appropriate software; and
- Strategy making, which include an integrated set of policies, objectives and actions within a unique and bespoke spatial strategy.

The implementation of the strategy was not an action contained in the brief and this is appropriately the responsibility of the Council. Focused consultation was carried out with selected stakeholders (from within the Council and from neighbouring Local Authorities) at a number of stages during the preparation of the strategy. The GI strategy will be presented for public consultation as part of the upcoming statutory County Development Plan, 2016-2022. The preparation of County Development Plan itself will be the subject of the prescribed statutory consultation process, during which, the public can comment on proposals on Green Infrastructure.

The brief for the Green Infrastructure strategy contained the following questions:

- Is the current GI resource base fit for purpose for the future?
- How can barriers and deficits be mitigated and/or removed?
- What actions should be prioritised to ensure delivery of benefits?
- How can these actions be funded?

1.8 Policy, Planning and Development Context for Dún Laoghaire-Rathdown

The European Commission's Communication, 'Green Infrastructure (GI) — Enhancing Europe's Natural Capital, 2013', underpins the important role of GI and describes the future EU strategy. It sets out key areas for strategy development and promotes the delivery of GI across urban and rural areas in all member states. It addresses the integration of GI into current policy areas, the need for consistent and reliable data, improving the knowledge base and encouraging innovation, providing financial support for GI projects and EU-level GI projects. The close relationship between spatial planning and Green Infrastructure is recognised when it states, 'Green Infrastructure is based on the principle that protecting and enhancing nature and

natural processes, and the many benefits human society gets from nature, are consciously integrated into spatial planning and territorial development.'

'Green Infrastructure is based on the principle that protecting and enhancing nature and natural processes, and the many benefits human society gets from nature, are consciously integrated into spatial planning and territorial development.'

'Healthy Ireland - A Framework for Improved Health and Wellbeing 2013-2025', published by the Department of Health, details the close relationship between (physical and mental) health and the environment, physical activity and social interaction. It shifts the focus from what can go wrong in people's lives towards what makes lives go well. It emphasises the need to create a better environment for people to live in and to provide opportunities for healthy lifestyles to improve the overall health of the population.

1.8.1 Planning Policy

The Green Infrastructure strategy for the County has been prepared within a hierarchy of strategy, policy and plans. It is also informed by practice and professional guidance for planning of GI within plan making and design.

1.8.2 National Guidance

The National Spatial Strategy (2002-2020) provides an overarching national planning strategy for balanced regional development, within the overall objectives of sustainable development. The strategy sets out a spatial hierarchy of settlements, and includes important objectives for the natural and built heritage, transport and recreation. The strategy is currently under review.

There are no statutory planning guidelines dealing explicitly with Green Infrastructure in the planning system. The current set of planning guidance does, however, deal with aspects of policy and practice, which are relevant to GI strategies. Notably, the 'Development Plan Planning Guidelines (2007)' set out the approach to more consistent plan-making for natural and built heritage and transport. At the local level, the 'Urban Design Manual (2009)' and the 'Local Area Plan Manual (2013)' promote an integrated approach to plan-making and master planning for residential areas, where built and natural heritage are central considerations. The 'Flood Risk Management and Development Guidelines' (2009) also underpin the importance of a risk-based approach to flood and water management, particularly in urban areas and the GI is a key aspect of this approach.

The recent 'Draft National Landscape Strategy (July 2014)', sets out a vision and roadmap for landscape planning, conservation and management in the State. The importance of landscape characterisation is highlighted in the strategy.

1.8.3 Regional Planning Guidelines

The 'Regional Planning Guidelines for the Greater Dublin Region, 2010-2022' set out the context and vision for the sustainable planning and development of the region to 2022. The guidelines highlight that, at a regional level, the function of GI planning is to provide an overview of natural and cultural resources with emphasis on the identification of priority elements and routes. The guidelines include an overview of significant resources for the region and an elementary GI network for the Greater Dublin Area, which includes the strategic GI elements of the coastline, the Dodder and the Shanganagh Rivers.

Key priority actions include:

- Ease of access and promotion of biodiversity
- Preparation of GI strategies at habitat, local and site-specific scales
- Protection buffers, identifying and addressing areas of open space deficiency, developing linkages along water corridors
- New and extended networks of walkways, cycleways, coastal paths
- Application of coastal zone management principles
- Green bridges to address barriers
- Tree planting and landscape enhancement

Strategic recommendation GIR30 is of particular relevance to this strategy:

'Each Council should prepare a county based Green Infrastructure Strategy linking to adjoining areas and following regional connections, and implement GI strategies in local area plans and development management processes. (Local authorities, shall where necessary, liaise with each other to ensure consistency in delivering regionally identified Green Infrastructure development as part of their Green Infrastructure strategies).'

And strategic recommendation GIR31 states:

'GI development should be identified at the initial stages of all planning processes and included as a material consideration in order to inform future development.'

1.8.4 Dún Laoghaire-Rathdown County Development Plan, 2010-2016

The statutory development plan contains a range of strategy, broad policies and specific objectives for the County. The plan sets out the vision to establish and foster a 'green structure' in the County and requires that this be elaborated and expanded upon by formulating an integrated GI strategy. A range of policies relevant to his strategy are included under the different policy chapters, including, Landscape Heritage and Biodiversity, Open Space and Recreation, Conservation of Archaeological/Architectural Heritage, Sustainable Travel and Transportation and Environmental Infrastructure and Management. The plan also includes local zoning and specific objectives, which have been considered in the analysis under the relevant GI themes.

1.8.5 Local Area Plans

Local Area Plans (LAPs) play an important role in guiding the future development of key areas of the County. LAPs have been adopted and are current for Stillorgan, Kiltiernan/Glenamuck, Glencullen, Woodbrook/Shanganagh, Deansgrange and Goatstown. The Stepside Action Plan was adopted in 2000, prior to the current legislation for LAPs. The Blackrock LAP is at Draft stage and the Dún Laoghaire LAP is proposed and at Pre-Draft, Non-Statutory Consultative Phase. The Planning Scheme for the Cherrywood Strategic Development Zone was approved by An Bord Pleanála in April 2014. This SDZ had a significant GI component.

The Local Area Plans show a range of approaches to Green Infrastructure in terms structure and content, reflecting the time at which they were prepared, current practice and the unique, local issues and opportunities. The Local Area Plans all deal with detailed aspects of built and natural heritage, biodiversity and transportation under separate themes. There are aspects of the Local Area Plans that are exemplary of key themes of GI. However, as would be expected, none of the LAPs sets out a vision or contains a stand-alone strategy for local GI. In addition an Urban Framework Plan was adopted for Sandyford in 2011.

1.8.6 Other Strategies and Non-Statutory Plans

A range of high level strategies in the area of natural and built heritage, transport, health and amenity are of relevance to the Green Infrastructure strategies. These are considered in appropriate detail under the relevant themes of this strategy.



Photo 5: Cabinteely Park.





Photo 6: Chimney at Ballycorus Leadmines. Source: Wikimedia. image By: Joe King.

2. Analysis

2.1 Introduction

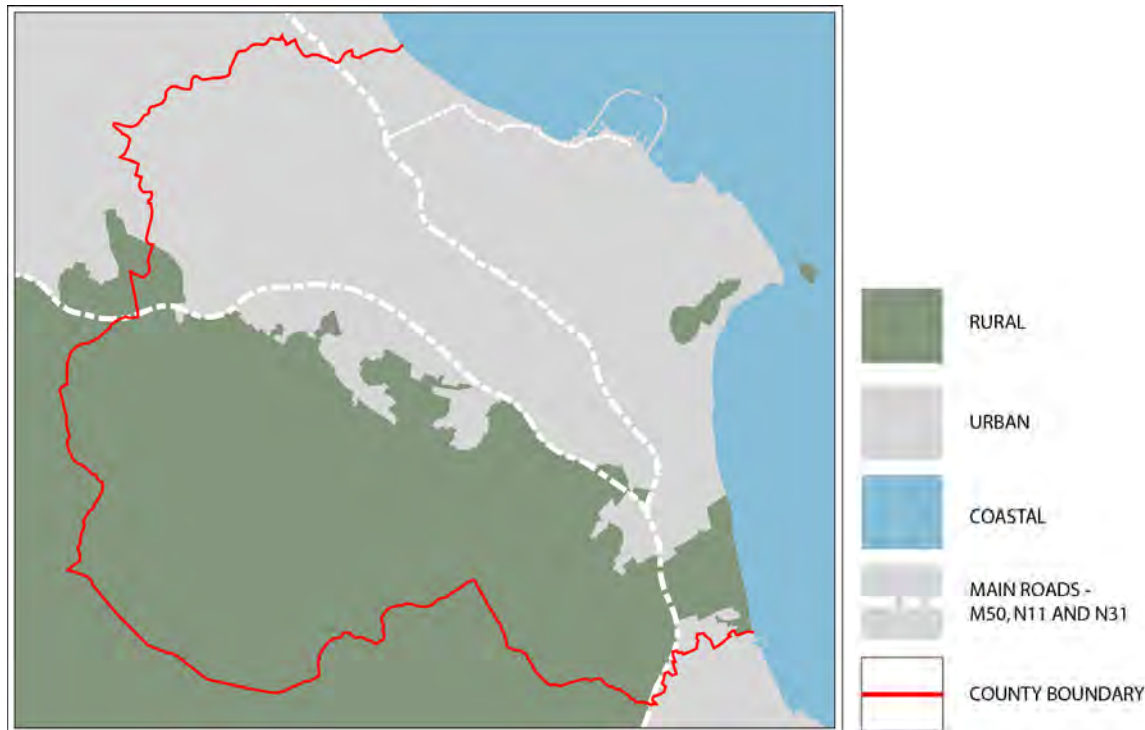
This section provides an overview of the analysis undertaken for this strategy. It brings together the main elements of the consultation, site visits and surveys, character assessments, mapping data, and document and policy reviews. A more detailed map analysis of the data sets used to inform the Green Infrastructure in Dún Laoghaire-Rathdown is contained in the appendices.

Appendix A contains the data sets used, with Appendix B converting the data into analytical maps used to inform the strategy.

The Green Infrastructure Strategy themes identified in Chapter 1 for Dún Laoghaire-Rathdown are:

1. Accessibility, recreation, health and well-being
2. Natural and cultural heritage
3. Water management

These three themes are set out here under their main components and assets. This is followed by an outline of the principal aspects of policy and spatial analysis for the themes. Each theme concludes with an outline of key challenges and opportunities.



Map 1: County Character Zones.

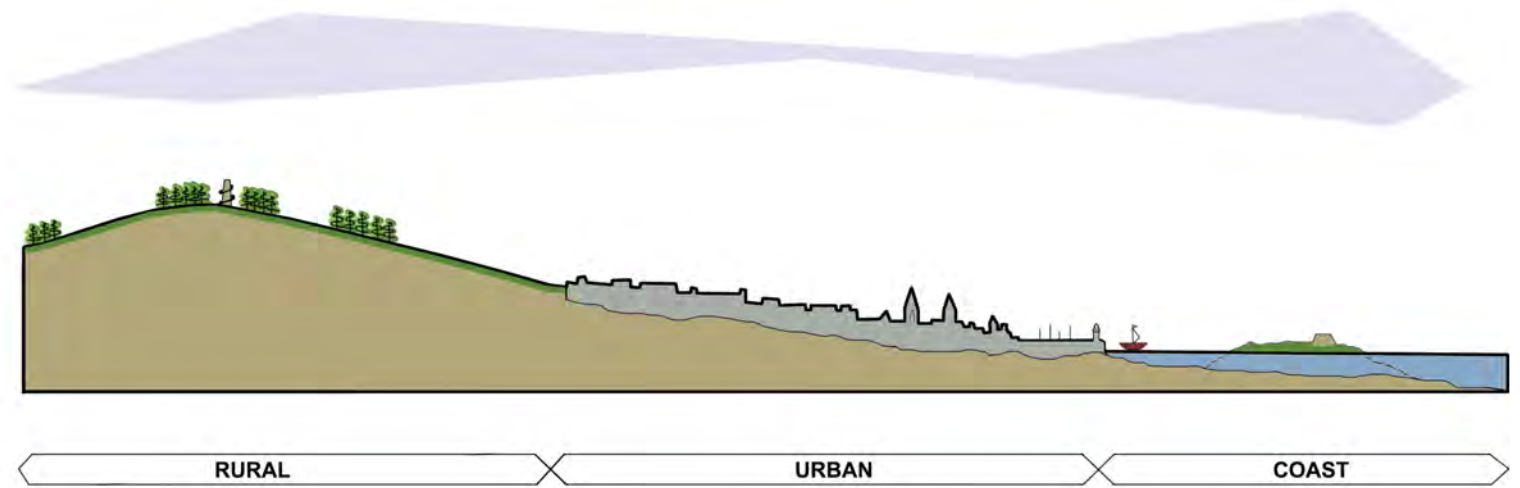


Figure 2.A: County Character Zones - Rural to Urban to Coast

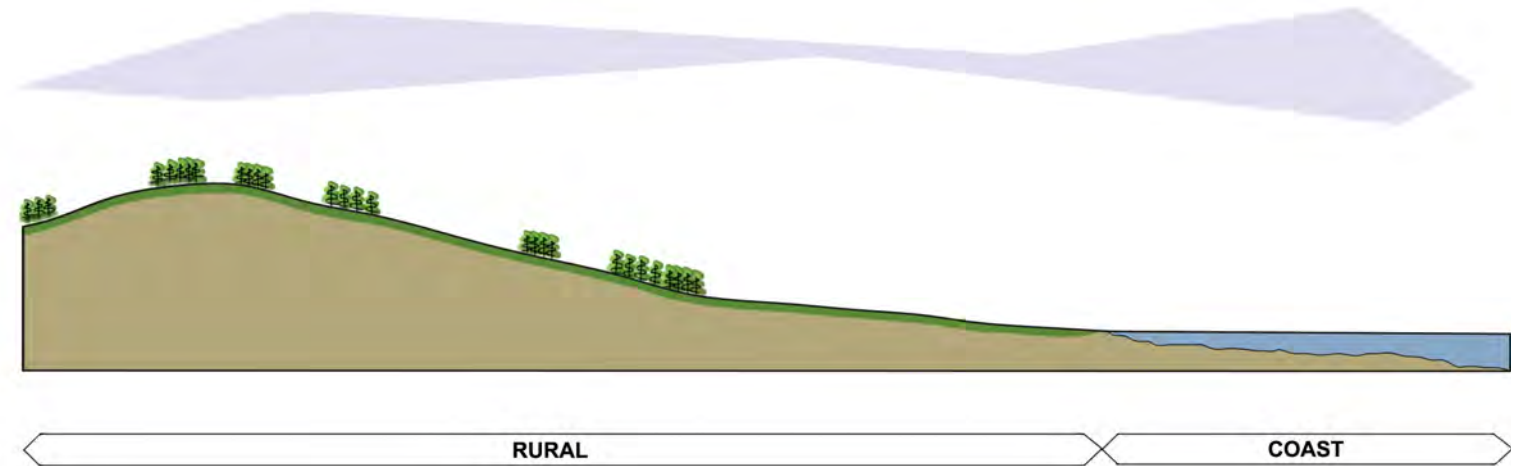


Figure 2.B: County Character Zones - Rural to Coast

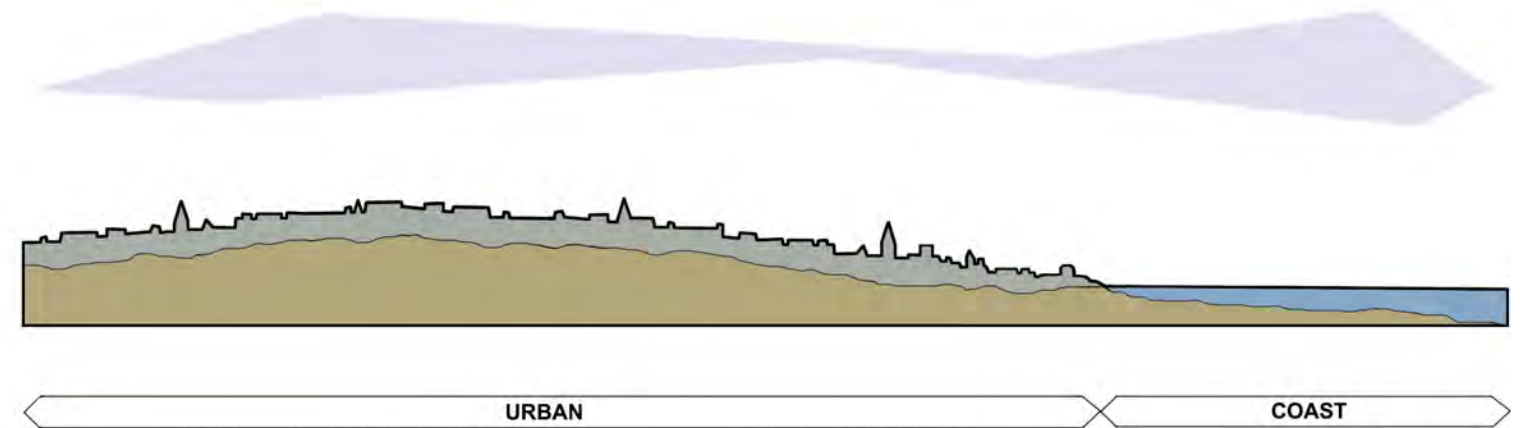
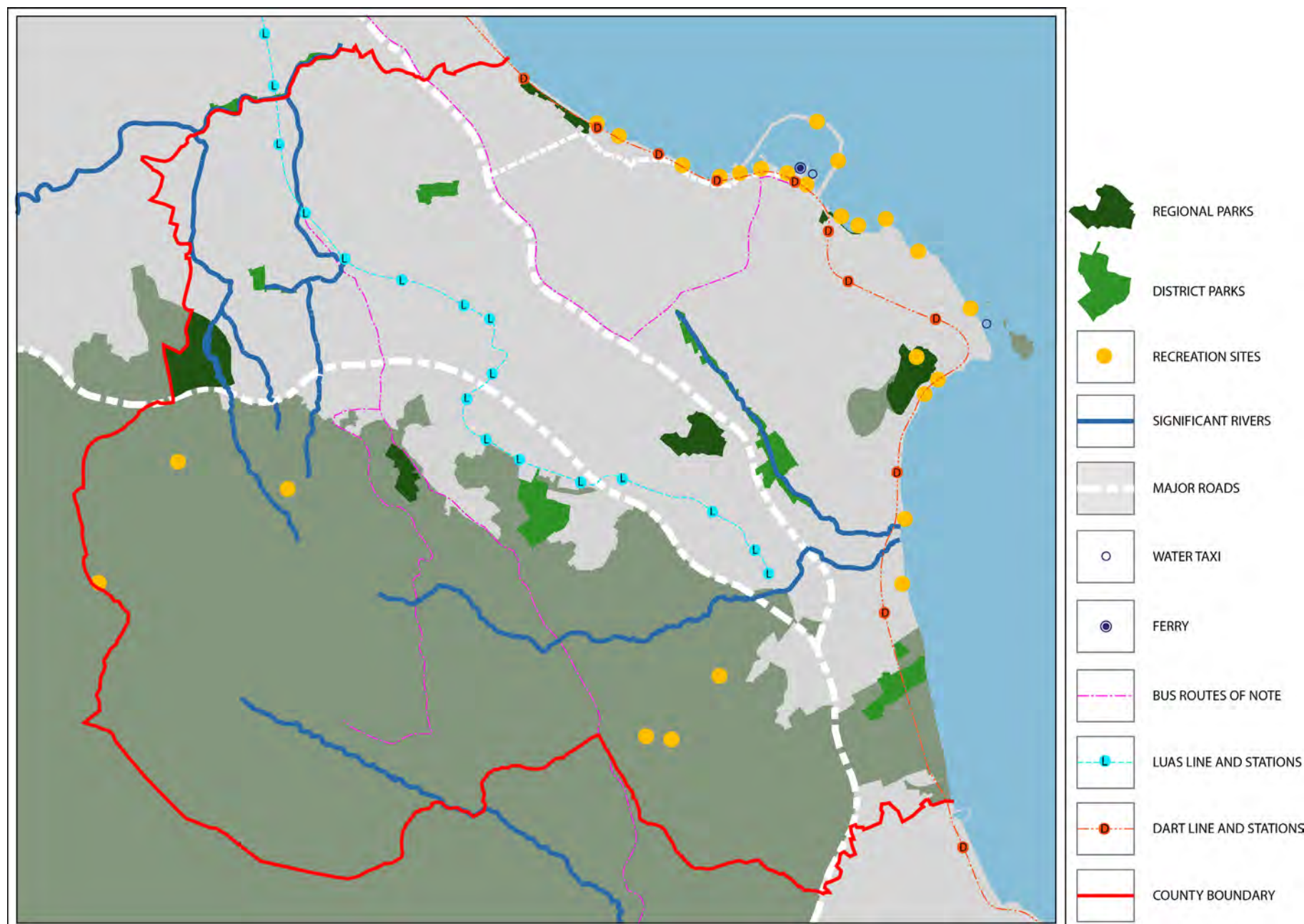


Figure 2.C: County Character Zones - Urban to Coast



Map 2: Main Green Infrastructure Assets in the County.

2.2 Accessibility, Recreation, Health and Well-Being

Green Infrastructure can support healthy active lifestyles through the provision of parks, green spaces and Greenways that encourage people to engage with the external environment. This is considered to improve both physical and mental health and a sense of community. This section examines the essential relationship between people and

the GI assets and activities in Dún Laoghaire-Rathdown. It provides an overview of the current policy and studies in the area, along with a concise spatial analysis of the County. Supporting mapped analysis of this theme can be found in Appendix B.

Accessibility

In terms of accessibility this Strategy is concerned with the following elements:

- Movement – the nature and quality of connections to and between the activities and green assets in the County
- Linkages – the continuity or fragmentation of movement routes
- Accessibility – the ease of access to key assets such as open spaces, Greenways and recreational resources

At the County level, the main links that underpin access to Green Infrastructure assets are; Greenways (existing and proposed), the urban cycle network (existing and proposed), Rights of Way, Recreational Access Routes, the Wicklow Way, the Dublin Mountains Way, walking trails in the Dublin Mountains, the main road and bus corridors, light rail (Luas green line) and the Dublin Area Rapid Transit (DART) and national rail lines, cruise liners, ferry and water taxi.

Recreation

Recreation comprises a range of assets, which have the following access attributes:

- Open Space – the availability and ease of access to assets such as parks, mountains, coastline, river corridors, landscape character and views
- Amenities and attractions – the range, nature and frequency of activities that take place within the open spaces

At the County level, the main recreational assets are the Dublin Mountains, key parks and open spaces, the coastline and river corridors.

Health and Well-Being

The theme of health and well-being has a number of components, which are:

- Environmental Quality – the quality of the air, water and soil
- Community – the accessibility and availability of open spaces other GI assets to existing and future communities
- Significant views and vistas

At the County level, the main assets related to these components include key open spaces, the principal Greenways, right of ways and recreational access routes, notable recreation activities and areas of significant tree cover.



The components of accessibility, recreation, health and well-being are discrete but interwoven. As stated above, when planned, designed and managed together they can support healthy and active lifestyles by attracting people to the outdoor environment. GI can promote a greater sense of community and provides both physical and mental health benefits.



Photo 7: Deerpark, Mount Merrion.

2.2.1 Policy Context

Policies which are relevant to the accessibility, recreation, health and well-being in Dún Laoghaire-Rathdown are currently spread over a number of policy documents. Of most direct relevance are the GI objectives of the current, statutory County Development Plan. The County Development Plan notes that Dún Laoghaire-Rathdown has significant GI assets. However, it acknowledges the fragmented nature of open spaces and green corridors within the County. It identifies a number of objectives in key areas for GI, such as:

- The creation of a 'Green Network' for the County
- Development of a comprehensive network of County Greenways
- Preservation of recreation access routes and right of ways
- Promotion of the development of regional and local networks of hiking and walking routes and trails
- Preparation of an all-encompassing Green Space Strategy for the County
- Conservation and enhancement of existing High Amenity Zones
- Preparation of a County Tree Strategy

Recreation Policy Context

The 'Dún Laoghaire-Rathdown Open Space Strategy 2012-2015' addresses both accessibility and recreation. It indicates that the County has adequate provision of open space in line with the Department of Environment's current guidelines (Sustainable Residential Development in Urban Areas, 2008), although this is unevenly distributed across some parts of the County. The Open Space Strategy found that 80% of all households in the County live within 600m of a park. The Open Space Strategy also reviews the quality of open spaces in terms of how welcoming, well maintained and safe they are from a visitor's perspective.

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Dún Laoghaire-Rathdown has completed the County Sports Participation Strategy, 2013-2017 which sets out a number of objectives for the overall benefit of recreation in the County. These include targeting populations shown to have lower participation rates, tackling the issues and barriers that prevent participation, maximising the use of the natural environment, and promoting the use of the coast and other natural resources. Findings from the Irish Sports Monitor indicate that Dún Laoghaire-Rathdown is one of the top performers in Ireland in terms of activity levels. From the perspective of GI both active and passive recreation are equally important.

Findings from the Irish Sports Monitor indicate that Dún Laoghaire-Rathdown is one of the top performers in Ireland in terms of activity levels.

Accessibility, recreation, health and well-being aspects of Green Infrastructure are also central to local spatial planning in the County. There is a range of objectives in current Local Area Plans, the Cherrywood Strategic Development Zone and non-statutory local spatial plans for protecting and delivering the GI at the local level. There are significant local objectives which are also of County-wide significance, for example, the objective to develop a number of amenity open spaces including, the proposed Tully Park at Cherrywood as contained in the Cherrywood Strategic Development Zone.

Accessibility Policy Context

The Dublin Mountains Partnership (DMP) has been set up to represent the recreation users of the Dublin Mountains. The partner organisations include Coillte, Dún Laoghaire-Rathdown County Council, South Dublin County Council, Dublin City Council, National Parks and Wildlife Services and the Dublin Mountains Initiative. The main aim of DMP is to improve the overall recreational experience for users of the Dublin Mountains while recognising the objectives and constraints of the various landowners. The long term strategy of

the DMP is to manage recreation in the Dublin Mountains in a more sustainable way. In this regard the strategy aims to undertake other initiatives including the provision of trails to improve visitor access and use of this natural resource.



Photo 8: Two Rock Mountain. Source: Wikimedia. Image By: Joe King.

In the context of accessibility the Smarter Travel Policy sets the context for sustainable transport provision at a national, regional and local level. In overall terms the policy is aimed at reducing the dependence on travel by car in favour of sustainable forms of movement on foot, bicycle and public transport.

The County Cycle Network consists of off-road greenway routes (suitable for all pedestrian and cyclist users), cycle routes through low traffic residential areas and cycle routes along busy traffic routes. The network is complemented and reinforced by the Greater Dublin Area Cycle Network Plan. The County Cycle Network's purpose is to connect the main attractions within the County and to provide effective through-movement for cyclists, ultimately encouraging more people to cycle as their primary mode of transport in line with the objectives of the Government's Smarter Travel policies. It is designed to cater for all cycling purposes ranging from travel to work and school to amenity and leisure cycling.

The 2011 Census demonstrated that Dún Laoghaire-Rathdown had the second highest modal share in the Greater Dublin Area for travel to education and work by bicycle at 5.1%.

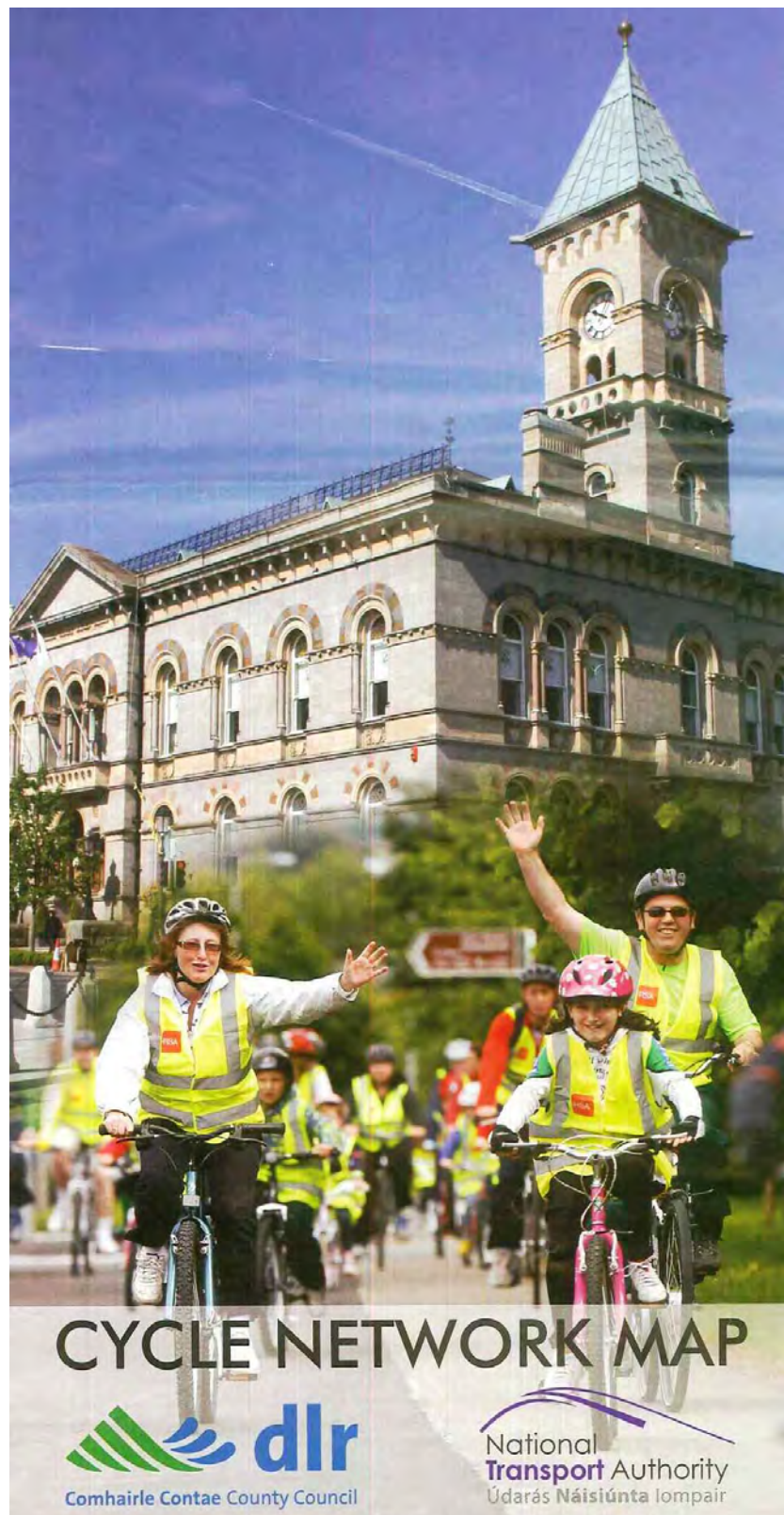


Figure 2.D: Dún Laoghaire-Rathdown Cycle Network Map.

Seventeen Greenways have been identified in the Draft County Development Plan 2016-2022 to build upon the Cycle Network Plan and a phased programme of works is being initiated, as resources allow, to bring the Greenway network into fruition. Greenways are multi-modal but are an important part of the off road cycle network. These Greenways have been largely derived from the Council's Open Space Strategy 2012-2015, where a proposed network of urban Greenways were identified to connect the key open spaces of the County, link centres of population and run parallel to the coastline. It identifies fragmented existing local walks and proposes their connection to urban Greenways and to hiking on the mountains, thus completing a green structure to the County which will connect beyond the County into surrounding Local Authority areas. The Open Space Strategy identified that further work would be required to assess the feasibility of each route in the proposed network. This has been partly undertaken for the Cycle Network Plan, and has been used as the primary source of the Greenway network.

Health and Well-Being Policy Context

'Healthy Ireland - A Framework for Improved Health and Wellbeing, 2013-2025', published by The Department of Health details the close relationship between (physical and mental) health and the environment, physical activity and social interaction, shifting the focus from what can go wrong in people's lives, to what makes lives go well. It also focuses on the role of a better quality environment for people to live in, where there are greater opportunities for a healthy lifestyle and an overall improvement in the health of the population. Trees are one of the main components for maintaining a healthy environment in particularly for climate amelioration and a reduction in heat stress in urban areas. A County-wide survey of trees is currently being undertaken to identify opportunities for strategic tree planting and improve the management of trees.

2.2.2 Spatial Context

These components are now considered in their spatial context. The 7 subjects addressed in this theme are:

- Rural recreation
- Urban recreation
- Coastal recreation
- Accessibility in the rural area
- Accessibility in the urban area
- Accessibility along the coast
- Health and well-being

The spatial context provides an overview of the main accessibility, recreation, health and well-being components of the Green Infrastructure for the Dún Laoghaire-Rathdown, which are of County-wide significance. The County is considered to be marginally more 'urban' than 'rural' in terms of broad character and function and it is

characterised by three basic typologies: rural consisting of upland landscape; urban consisting of towns, villages and suburbs; and coastal. Each has a different set of recreational assets and activities.

Rural Recreation

The mountains and uplands are the largest connected area of open space in the County. The Wicklow Mountains National Park, including part of the Dublin Mountains lie on the periphery of the County. These are publicly accessible. However, they are surrounded by land in private ownership including agricultural land, which can restrict connections and recreational access routes. A number of recreational activities have been developed through the Dublin Mountains Partnership including the establishment of the Dublin Mountains Way, local hiking trails, mountain biking and orienteering. These, combined with the Wicklow Way, Right of Ways, Recreational Access Routes in the upland area of the County, create a network of long-distance self-guided walking trails that are typically trans-boundary in nature. The uplands and mountains are under increasing pressure from development (as outlined in the Landscape Character Assessment) and increased demand for recreation as a result of the on-going population growth and development pressures in the Greater Dublin Area and the County itself.



Photo 9: Dublin Mountains Way. Source: Wikimedia. Image By: Joe King.



Photo 10: Dublin Mountains Way. Source: Wikimedia. Image By: Joe King.



Urban Recreation

There are some 63 parks and 337 open spaces identified within the urban area of the County. These range in size from large suburban public parks to local pocket parks and squares. There is also a hierarchy of open spaces from regional parks, district parks, local parks, amenity open space and civic open space. Regional parks currently include Marlay Park, The People's Park and Newtownsmith, Killiney Hill Park, Cabinteely Park and Blackrock Park. District parks currently include Shanganagh Park, Kilbogget Park, Clonkeen Park, Deerpark, Meadowbrook Park and the Dodder Linear Park as well as the proposed Jamestown Park. Generally these parks provide both active and passive recreational opportunities including organised sport facilities.

In light of the recent acquisition of Fernhill Gardens, it is the Council's intention to develop Fernhill Gardens into a Regional Park with all the amenities that one would associate with a major park, such as pitches, playground, ponds, paths, car park etc., over the period of the County Development Plan 2016-2022. This will involve the preparation of a Master Plan for the site.

Overall, these parks are well dispersed across the County providing a variety of experiences for users ranging from parks adjacent to the coast, within the urban environment and at the threshold of the urban and rural landscapes. However, there are very slight deficiencies in certain areas, such as at Sandyford / Stillorgan electoral area, which will be overcome in the future with the development of the Public Open Space at Blackthorn Park and the development of Sandyford Business District Civic Park. There are also significant areas of land not in public ownership that provide publicly accessible open space for example lands at University College Dublin and Leopardstown Racecourse.



Photo 11: University College Dublin Campus.



Photo 12: Deansgrange Stream running through Kilbogget Park.

The major open spaces within the urban area generally form a loose circular pattern in plan, and offer a range of activities that form hubs for recreation activities. Linear open spaces are evident in areas such as Blackrock Park, Kilbogget Park, Clonkeen Park, the Dodder Linear Park, Seapoint Coastal Park and Shanganagh Cliffs to Killiney Beach. To the north of the County the Dodder Linear Park crosses the administrative boundary of Dún Laoghaire-Rathdown into Dublin City Council. The linear parks tend to follow rivers, making composite GI corridors.

The number of allotments, community gardens or urban farms within the County is limited. For example, allotments are located at Goatstown, community gardens are located at Shanganagh and there is an urban farm located at the Airfield Trust. There are other smaller community gardens within the County at a local level. Shanganagh Community Gardens have developed on 'backlands' formerly zoned for housing and are an example of a community gain from infrastructural development (adjoining Shanganagh Sewage Treatment Works plant). The Gardens have been highly successful in building social cohesion and in diminishing crime. While many individuals may grow vegetables etc. within their own private gardens, overall there is an uneven distribution and a large deficiency of allotment space accessible from areas of high residential density.

In addition to physical, psychological and social health, green spaces allow for a more holistic health solution – community gardens and food production.



Photo 13: Airfield Trust, Dundrum.

Coastal Recreation

The coast is a continuous (17km) chain of recreational assets and activities. It is one of the main attractions of the County. There are a variety of open spaces ranging from rocky headlands, inlets, harbours, piers, parks and beaches. Dún Laoghaire Piers are perhaps one of the most iconic recreational spaces in the County, most notably the East Pier. Each year 1.3 million people walk Dún Laoghaire's East Pier (source: <http://www.visitdublin.com>) passing the bandstand which evokes the town's Victorian seaside reputation for health and leisure. Views from the pier are enjoyed across the harbour, Dublin Bay and back towards Dún Laoghaire. Coupled with the range of spaces along the coastline, there is a concentration of recreational activities located along the coast, including swimming, sailing, diving, kayaking and fishing.

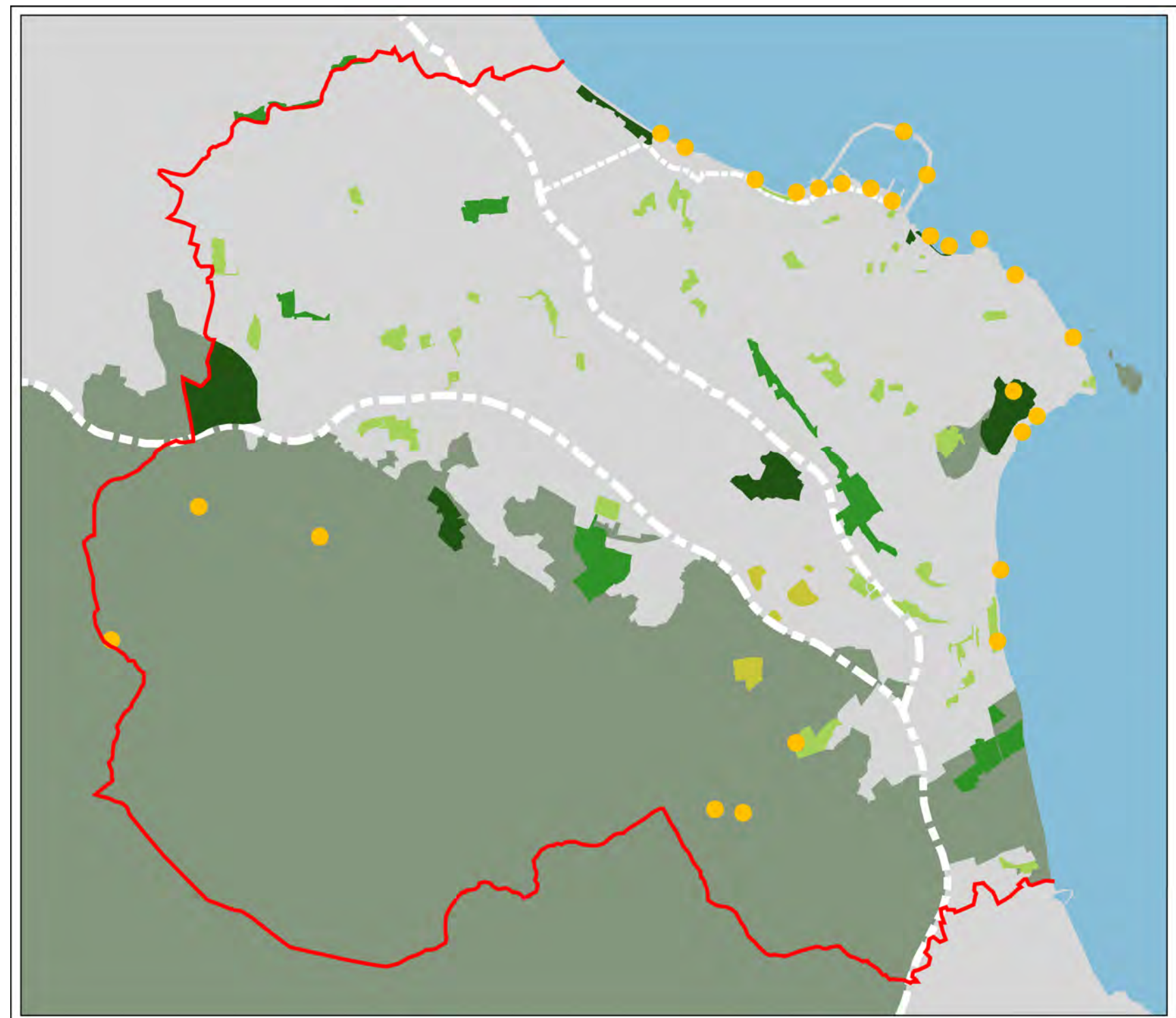
Each year 1.3 million people walk Dún Laoghaire's East Pier passing the bandstand which evokes the town's Victorian seaside reputation for health and leisure.

The Dalkey Islands, a Special Protection Area (SPA) and Special Area of Conservation (SAC), are located 3km south of Dún Laoghaire Harbour. They can be visited by renting a boat from Colliemore Harbour or Bullock Harbour.

The beaches have good water quality, for example, Killiney and Seapoint beaches are currently 'Blue Flag' beaches. Dún Laoghaire Harbour is a highly active recreational resource for dinghy and offshore sailing.



Photo 14: Dalkey Islands. Source: Wikimedia. Image By: John Fahy.



Map 3: Distribution of Parks and Recreation Sites in the County.



Accessibility in the Rural Area

The recreational facilities available in the uplands and mountains include hiking trails, such as The Dublin Mountains Way and the Wicklow Way, Right of Ways and Recreational Access Routes. Sections of walking routes in the County are part of the existing network of long-distance self-guided walking trails that pass through the County. Sections of the Wicklow Way, which continues into the Wicklow Mountains National Park, and the Dublin Mountains Way, are routed on the rural roads. The rural road network is also highly used by recreational cyclists who travel onwards through the Wicklow Mountains and the National Park.

There are a number of recreational access routes, both existing and proposed, from the mountains to the urban areas and trans-boundary into adjoining counties. The Open Space Strategy further identifies fragmented existing local walks with proposed connections that will link the Greenways in the urban areas with hiking routes on the mountains. Some of these cross open spaces at the threshold of rural and urban areas. This an opportunity that is noted from the Green Infrastructure analysis.



Photo 15: Farmland in the County.

Accessibility in the Urban Area

In addition to the Dublin Mountains Way, Wicklow Way, Right of Ways, Recreational Access Routes in the upland areas there is strong support for Greenways that are identified in the Cycle Network Plan and the Open Space Strategy for urban areas. These Greenways will link the key open spaces of the County. Some sections of these Greenways have been completed, for example, the Slang River, the Greenway through Clonkeen and Kilbogget Parks, sections of route along the coastline and The Metals. The Greenway network contains large sections which are off-road but also sections located on low trafficked roads, including the East Coast Route along Coliemore Road and the Vico Road.

The natural topography of the County is such that not all pedestrian routes are universally accessible, nor would it be desirable to make such interventions on the natural landscape. For example part of the experience of the park at Killiney Hill is overcoming the challenge of the topography.



Photo 16: People's Park, Dún Laoghaire.

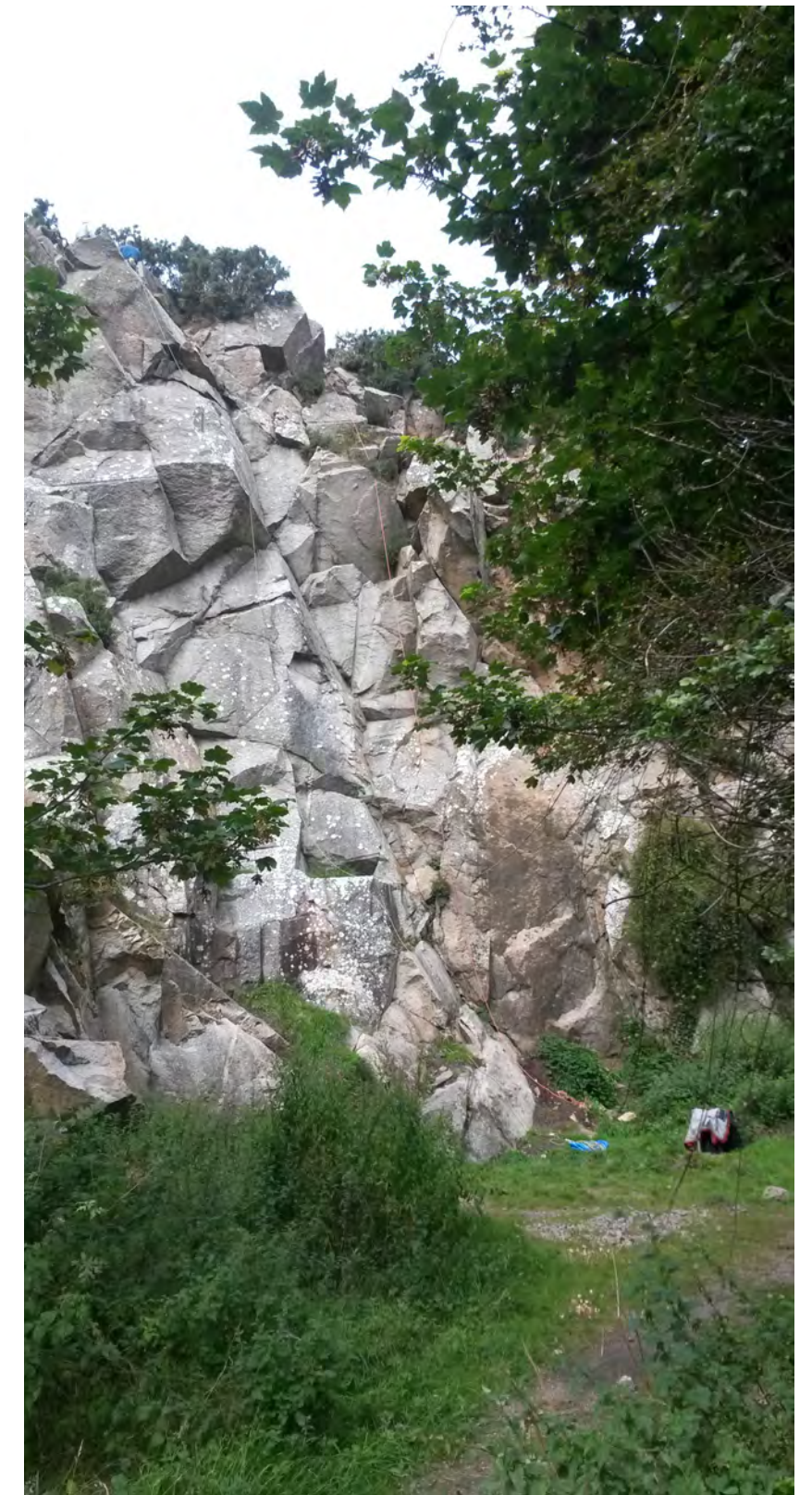


Photo 17: Rock Climbing at Dalkey Quarry.

There is a highly developed bus and rail public transport network in the County. These services currently offer access to open space within the County which can be further enhanced through improvements to public transport provision. The network consists of bus services as part of the Quality Bus Network. There are schemes identified to be developed to augment the current corridors which include, for example, the Stillorgan Road / N11 corridor. This corridor is currently being considered for development as part of Bus Rapid Transit Network for the core city area with the UCD to Blanchardstown via the N11 being one of two feasible cross city corridors. Bus Routes serving locations such as Enniskerry and Glencullen provide public transport connections to the upland landscape.

The Luas light rail green line and the DART line provide significant rail services within the County. The Luas offers the most proximate access to the upland landscape area and Luas Cross City will further enhance this accessibility.

Accessibility along the Coast

The nature of the local topography makes access to the coast difficult at certain locations. The ease of access varies due to changes in level, the design of the access route, and the constraints on the extent of access possibilities, for example the section of walk from Bray harbour to Killiney Beach at the base of the cliffs is only possible at low tide.

The DART offers excellent access to the coastal seascape corridor and the development of the service through the DART expansion scheme will further improve access to the County. Paradoxically the railway line also acts as a barrier to access. The DART line also provides a number of visual connections along the coast and beyond into neighbouring counties where physical connections are difficult.

The focus of recreational activities at the coast and in the mountains indicates that the main recreational movement is east-west from the urban area to the coast or to the mountains. Therefore the two main barriers to overcome are the M50 and the N11 which run north-south. Dún Laoghaire Harbour provides international connections through seasonal daily ferry services to Holyhead and a variety of cruise vessels visiting the harbour. On a smaller trans-boundary scale a private operator sails between Dún Laoghaire and Howth a number of times a day between March and October.



Photo 18: Dublin Bus.
Source: Flickr. Image By: Desomurchu Archive Gallery.



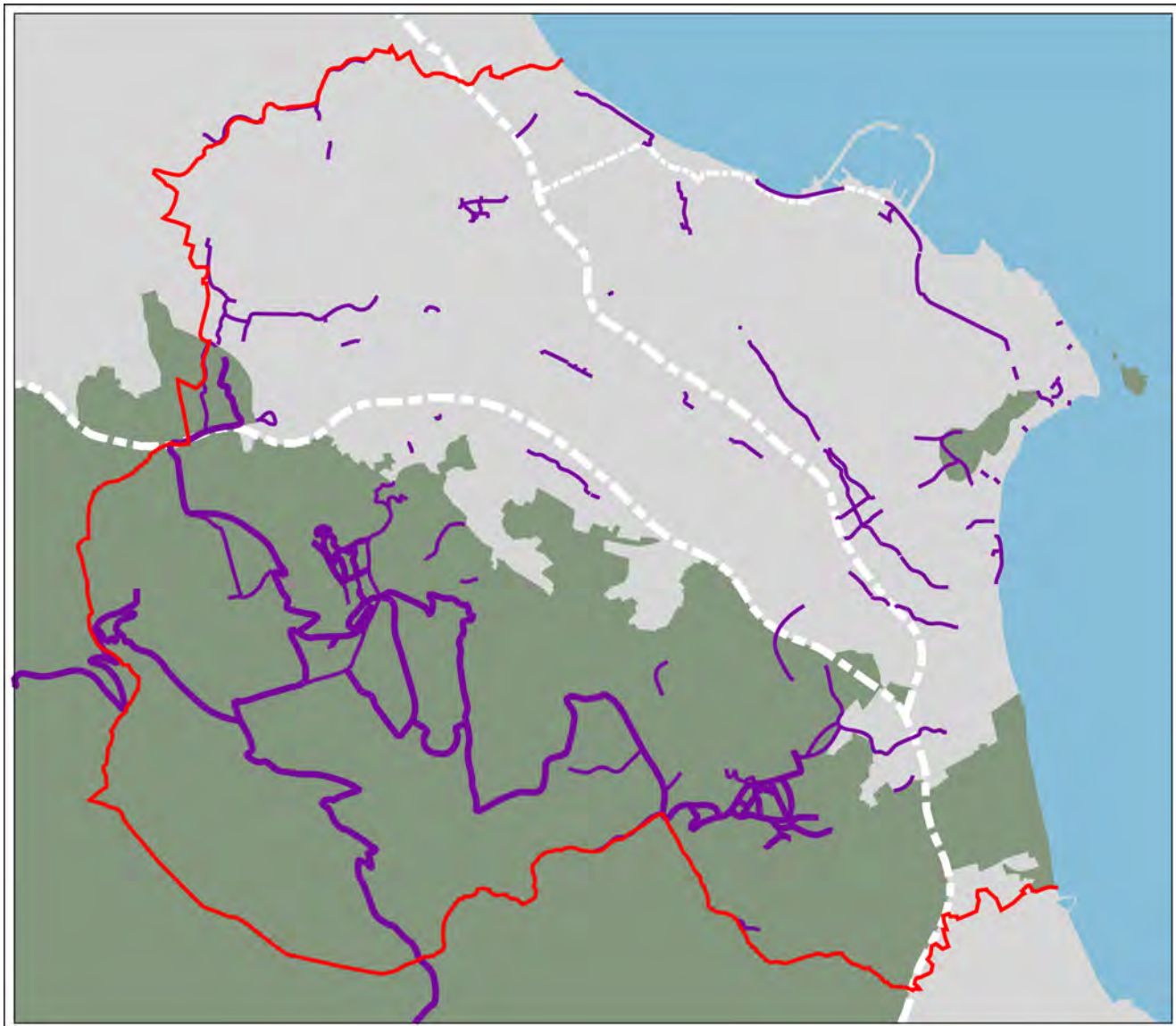
Photo 20: StenaLine Ferry at Dún Laoghaire.
Source: Copyright Albert Bridge and licensed for reuse.



Photo 19: DART at Killiney.
Source: Copyright Andrew Abbott and licensed for reuse.

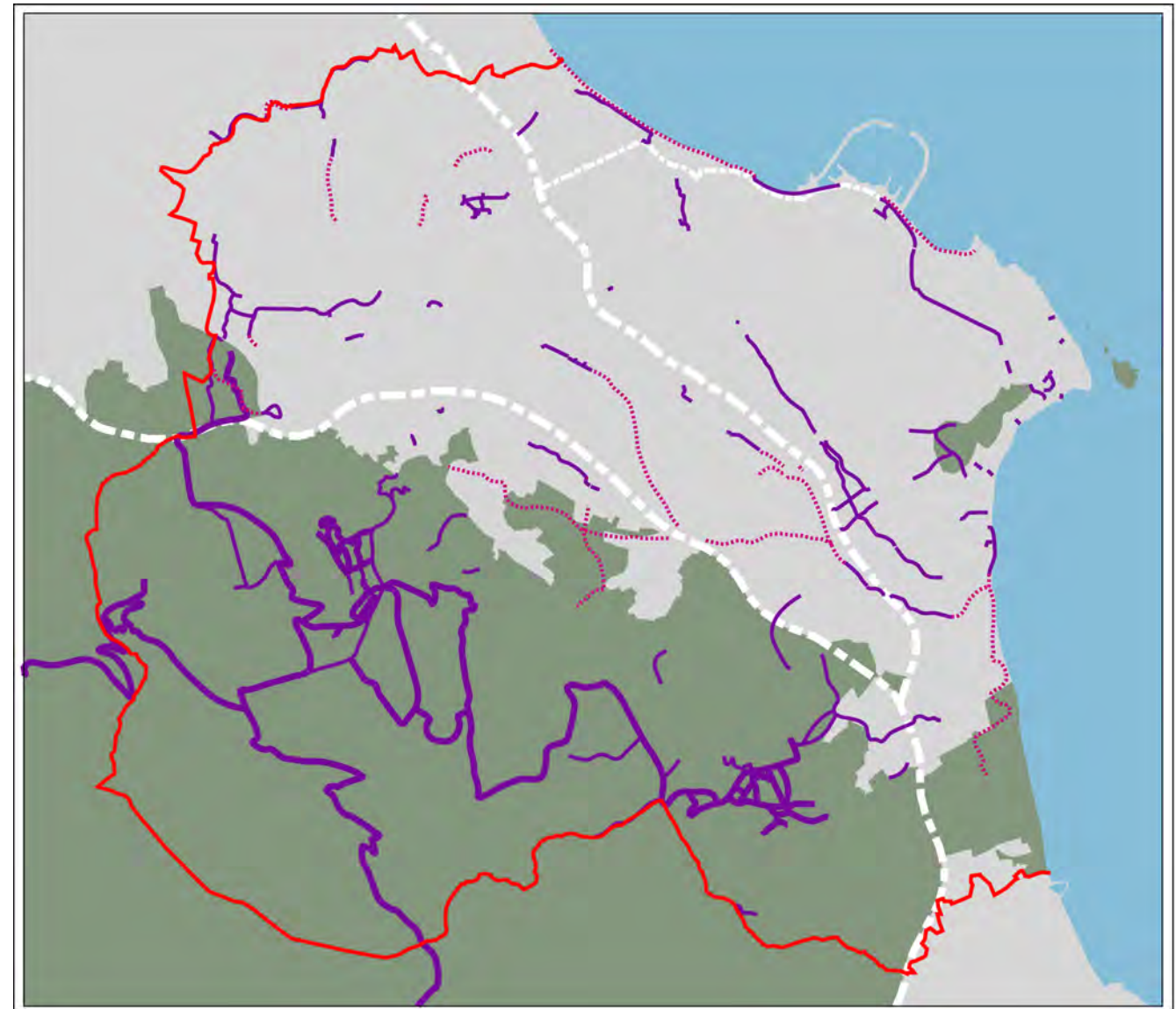


Photo 21: Sailing at Dún Laoghaire Harbour.
Source: Helen Bradley.



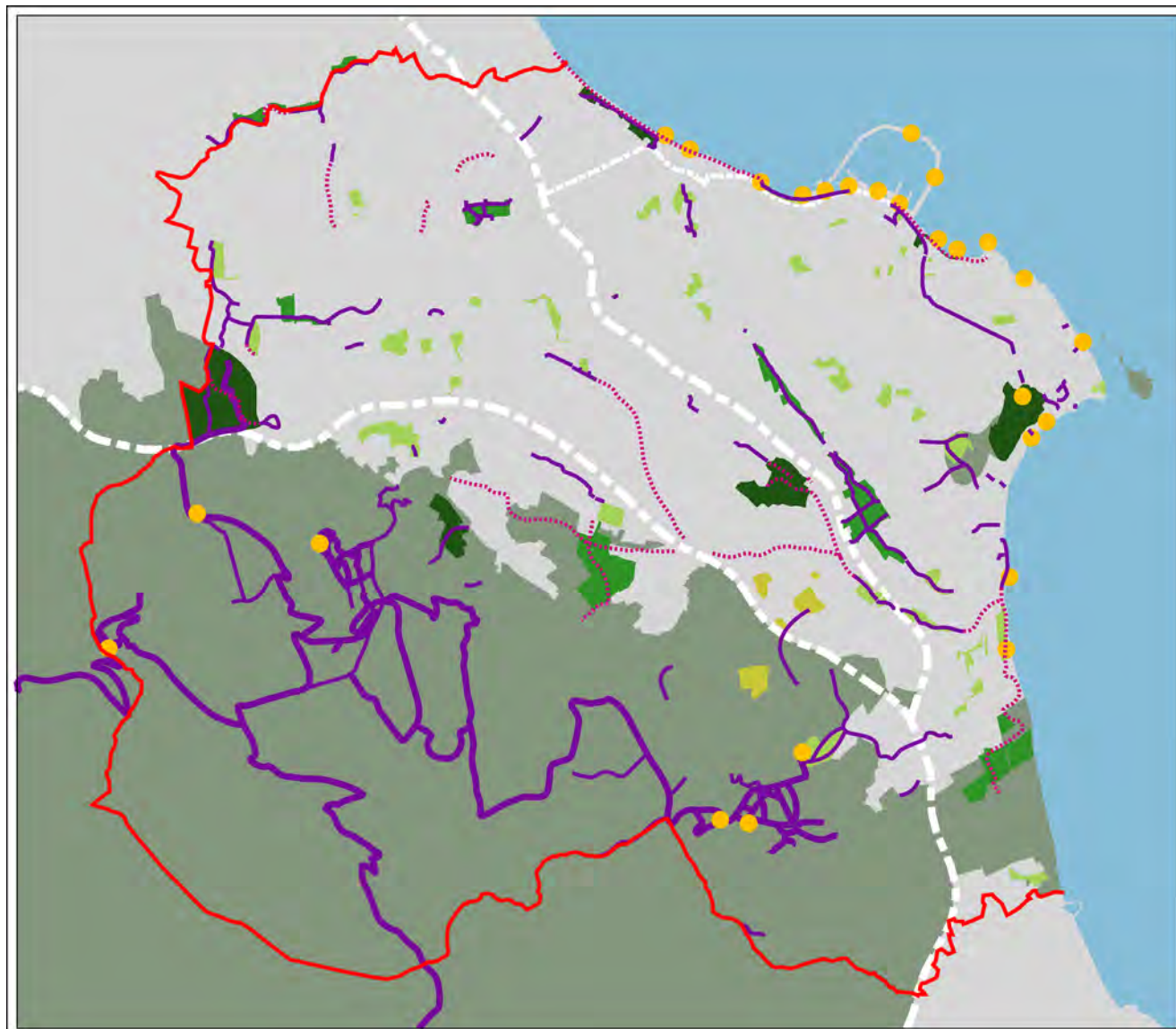
Map 4: Existing Connections in the County.

-  EXISTING DUBLIN MOUNTAIN WAY AND WICKLOW WAY
-  EXISTING CONNECTIONS
-  COUNTY BOUNDARY

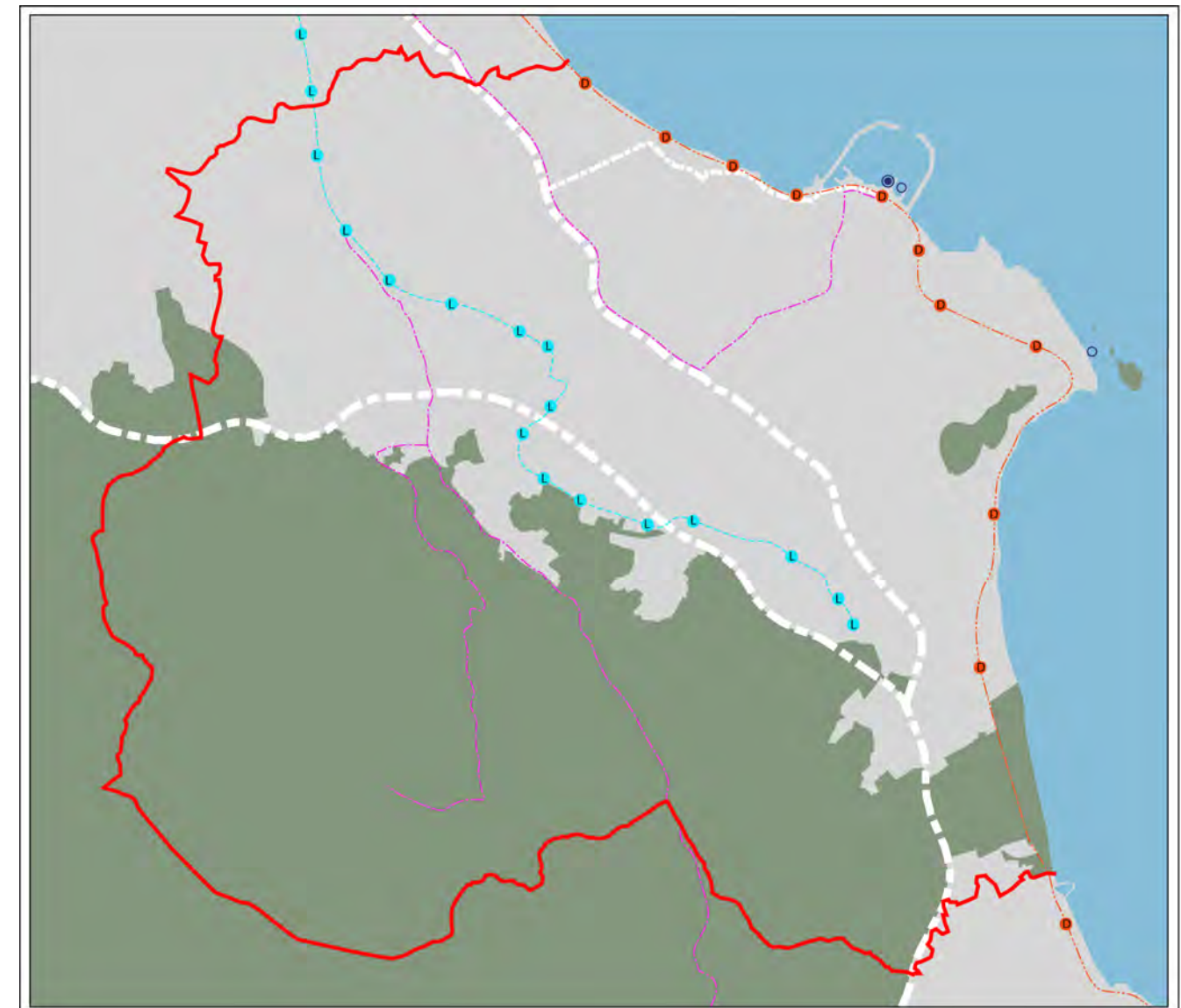
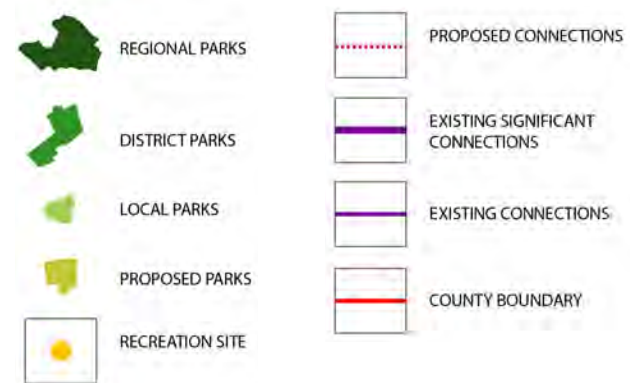


Map 5: Existing Connections and Proposed Greenways in the County.

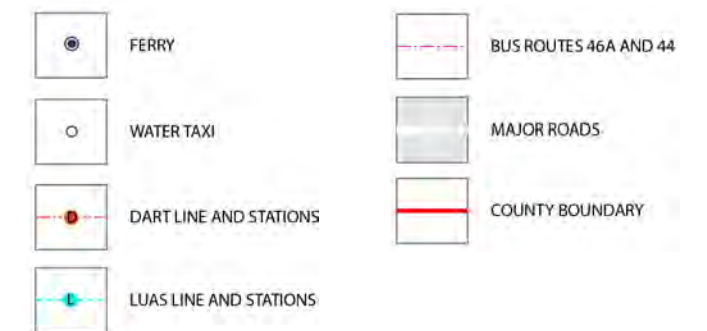
-  PROPOSED GREENWAYS
-  EXISTING DUBLIN MOUNTAIN WAY AND WICKLOW WAY
-  EXISTING CONNECTIONS
-  COUNTY BOUNDARY

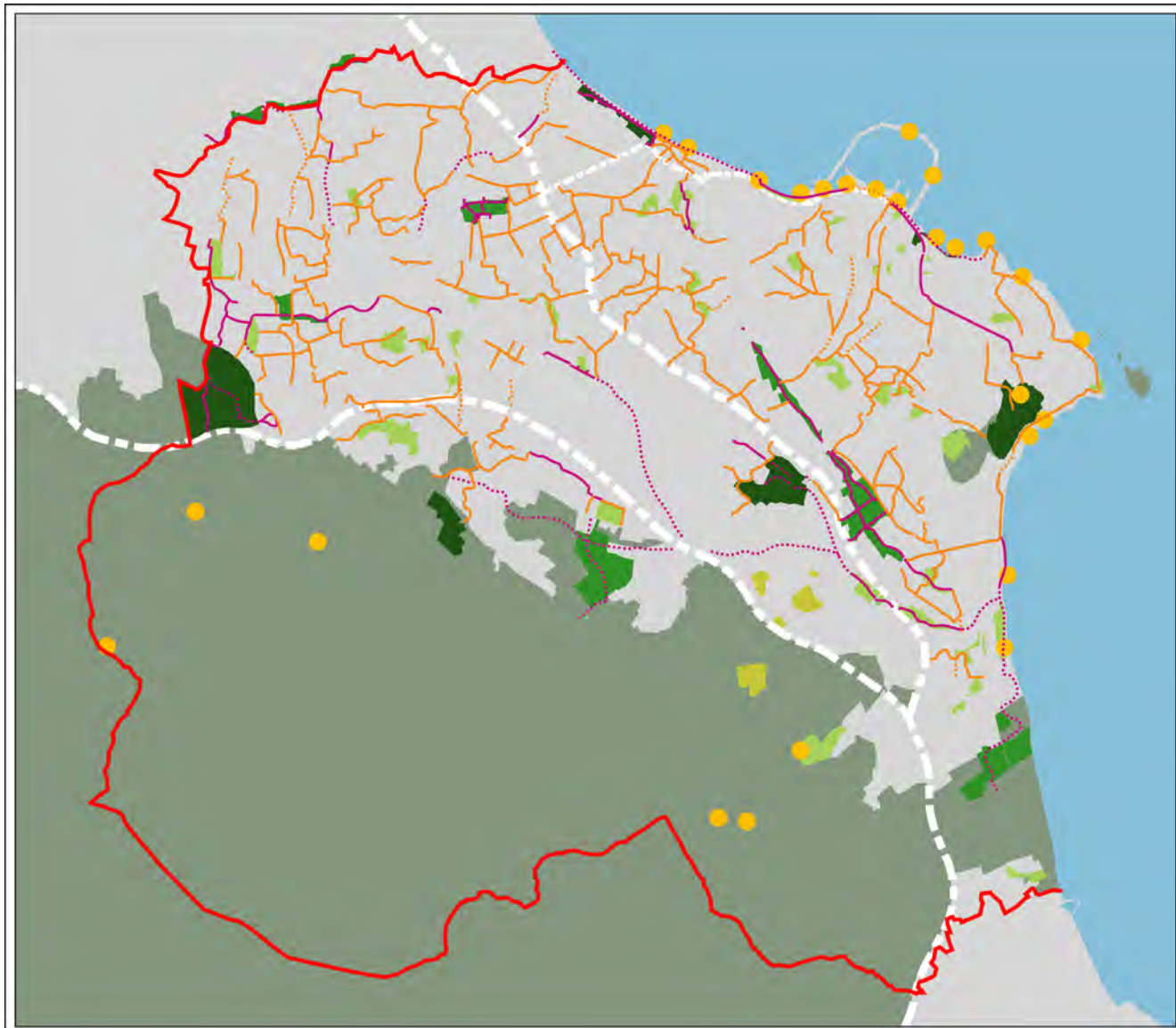


Map 6: Existing Connections and Proposed Greenways to Parks and Recreation Sites in the County.

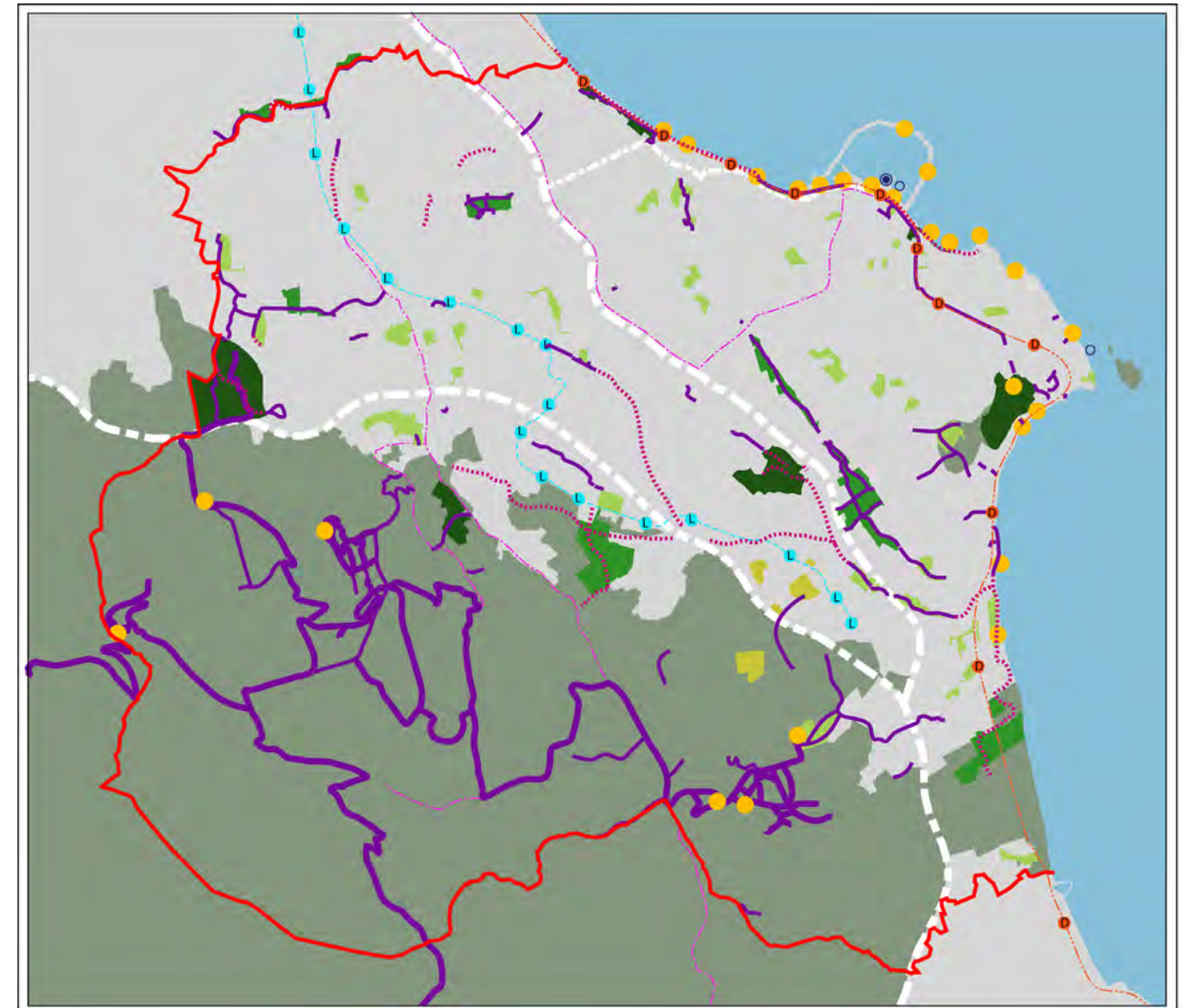


Map 7: Public Transport in the County.

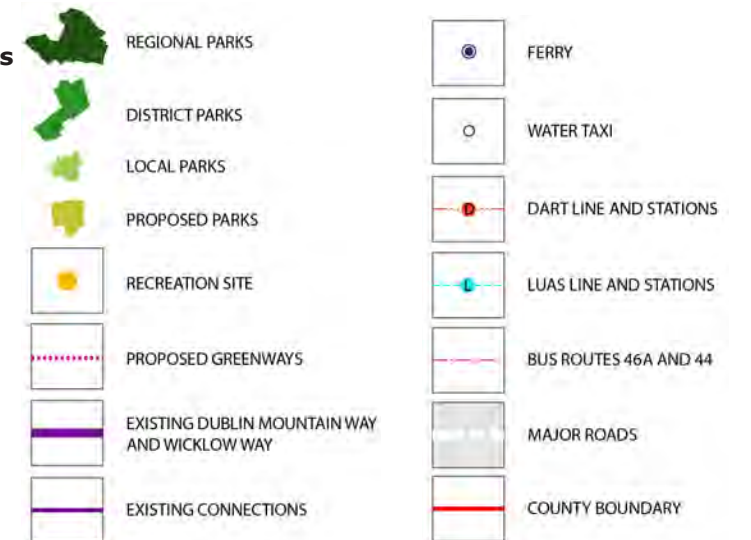




Map 8: Cycle Network Connections to Parks and Recreation Sites in the County.



Map 9: Connections and Public Transport provision to Parks and Recreation Sites in the County.



Health and Well-Being

There are community profiles utilising a set of over 200 health related indicators compiled for every Local Authority area in Ireland. This information from 'The Health Well' website (<http://www.thehealthwell.info/community-profiles>) which is managed by the Ireland and Northern Ireland's Population Health Observatory (INiPHO) supports evidence based decision making.

Current health related indicators for Dún Laoghaire-Rathdown compared to the Republic of Ireland are shown in Table 2.A.

Health Indicator	Dlr	RoI
Percentage of the population reporting very good or good general health (2011)	72.4	65
Percentage of the population reporting bad or very bad general health (2011)	4.4	5.6
Clinical diagnosis of self-reported, doctor-diagnosed diabetes in the previous 12 months (2010)	3.6	3.2
Clinical diagnosis of self-reported, doctor-diagnosed angina or heart attack in the previous 12 months (2010)	2.7	2.4
Percentage of people who are obese (2007)	13.4	14.4
Percentage of people who are physically inactive (2007)	33.4	28.4
Percentage of children aged 5-12 years that walk or cycle to school (2011)	32.1	25.8
Percentage of children aged 5-12 years that are driven to school by car (2011)	62.4	61.3
Number of deaths by suicide or undetermined event per 100,000 population (2013)	8.2	11.8
Number of admissions to hospital for anxiety or depression per 1,000 people (2009)	2.2	2.3
Percentage of working age population aged 15-64 years in receipt of benefits for depression and / or anxiety (2013)	1.2	1.1
Number of children's Playgrounds directly provided or facilitated by the local authority per 1,000 population (2012)	0.1	0.2
Local Authority expenditure on sports, recreation and leisure facilities per person (2014)	66.2	33.2
Percentage of primary schools participating in Environmental campaigns (2012)	94	92.2
Percentage of secondary schools participating in Environmental campaigns (2012)	100	92.2

Table 2.A: Comparison of Health Related Indicators

These statistics show the County has some positive indicators, demonstrating the success of current initiatives on cycling and recreational expenditure for example. There is a clear link between the improvements in an individual's health and physical activity and engagement with the natural landscape, but also a population's health is also linked to a healthy environment which relies on clean air, water and soil. Views containing trees and vegetation have been proven to be the most preferred landscapes for promoting well-being. They have the most positive influences on emotional and physiological states, reducing stress and anxiety and developing feelings of happiness, satisfaction, tranquillity and pleasure.

Health and well-being cannot be easily spatially mapped, but from a GI perspective landscape, vegetation and access to physical activity can identify potential deficits in provision across a community. The analysis on open space provision shows that the County is delivering at a good level, but greater participation and accessibility is required if the well-being of the population is to be improved. Green space is now seen as key part of the HSEs strategy of encouraging and empowering people to lead healthier lifestyles. The Green Infrastructure strategy reinforces the return of parks to their public health roots.



Photo 22: Trees in Cabinteely Park.

Trees are also important for climate amelioration and maintaining a healthy environment. Trees absorb carbon as they grow, and woods and forests can provide long-term carbon reduction benefits. Planting in urban areas, at the source of many atmospheric pollutants, can filter out those pollutants, reduce water run-off, improve water quality, reduce noise and provide shading to help reduce urban heat island effects.

The County can be considered as very green with considerable amounts of tree planting not only in forests and woodlands, parks, open spaces and along streets but also in private ownership particularly seen in the large private gardens for example at Killiney and Dalkey.

Open space within the County also includes burial grounds and graveyards of which there are eight in the County. They can be integrated into a GI network, a good example is at Deansgrange, which forms part of the Blackrock to Killiney Greenway.



Photo 23: Deansgrange Cemetary.
Source: Flickr. Image By: William Murphy.



2.2.3 Challenges and Opportunities

A number of challenges and opportunities for the Green Infrastructure Strategy have emerged from the policy and spatial analysis of accessibility, recreation, health and well-being in Dún Laoghaire-Rathdown.

Challenges

In general the policy context for Green Infrastructure in the area of accessibility, recreation, health and well-being for the County is robust. However, key challenges for current and future policy are evident and these include:

- The need to address gaps in the existing data such as the recording, mapping and surveying the existing trees in the County so protection and enhancement of tree cover can be managed.
- To provide the evidential link between green space provision and health and well-being is difficult; detailed surveys of how assets and activities influence community use and behaviour would be useful to support a policy response.

The spatial context for accessibility, recreation, health and well-being for the County, presents some key challenges. These are:

- Open space is generally within the desired distance of all high-density residential areas with the exception of the Sandyford / Stillorgan electoral area. There is a minor deficit in this area which will be overcome in the future with the development of the Public Open Space at Blackthorn Park, Sandyford Business District Civic Park and Fernhill Park as a Regional Park. There is also a long term plan to develop part of the existing reservoir at Stillorgan into a park. Until such time there is a challenge to provide accessible open space within this area.
- Greenways have been a part of previous strategies, such as the Cycle Network Plan and the Open Space Strategy. These have been a response to the fragmented access between urban areas and key green space assets. As they are multi-modal they have the potential to generate greater activity in themselves and an extended use of other GI assets. Proposed local walks are also identified to connect the fragmented upland landscape recreational access routes. These Greenways may require access to private land and overcome physical barriers, and as such have a spatial and technical challenge in their delivery.
- Accessibility to open space is examined with the distances to open space based on a straight line 'as the crow flies'. Distances do not take into account geographic considerations such as barriers created by roads, rivers or railways. This would form part of examination at local level to guide LAP's etc.

- It is a challenge to balance universal accessibility within natural landscapes. The natural topography of the County is such that not all pedestrian routes will be universally accessible. Barriers to access can be reduced, but it is not desirable to make significant interventions on the natural landscape; often part of the experience is the challenge of accessing the natural environment, some of which are sensitive.

Opportunities

The policy context for accessibility, recreation, health and well-being in the County presents some key opportunities to be delivered by the Green Infrastructure Strategy. These are:

- Preparation of a single GI strategy with a coherent set of planning policies and objectives around accessibility, recreation, health and well-being for the County.
- The opportunity to guide the relevant sections of the County Development Plan, in particular the 'Landscape, Heritage and Biodiversity', the 'Open Space and Recreation' and the 'Sustainable Travel and Transportation' sections.
- The opportunity to inform and provide a method for consistency by which GI strategies for accessibility, recreation, health and well-being are incorporated into LAPs, SDZs, Framework Plans and other local policy documents.
- The opportunity to complete the 'Draft Policy on Community Gardens for Dún Laoghaire-Rathdown.
- The opportunity to develop an inventory of open spaces and their facilities, so that new development can mitigate any deficits.

The spatial context for accessibility, recreation, health and well-being in the County presents some key opportunities. These are:

- The open spaces on the threshold between urban and rural areas can act as a transition between the rural and urban landscapes. A central concept of the spatial element of this strategy is that of a 'Gateway Park'. These parks should function as starting points which facilitate and encourage people to visit rural and coastal areas and connect to the Dublin Mountains Way and the Wicklow Way. They should also be welcoming for people coming back to the urban area after hiking or cycling, with facilities and attractions in their own right.
- Providing new and improved connections between major open spaces in the urban areas will generate a suite of strategic corridors which will encourage day to day use, to and from home, work, and education etc. particularly for cycling.
- Addressing the uneven distribution of allotments or community gardens accessible from areas of high residential density will improve health and well-being and social cohesion.

2.3 Natural and Cultural Heritage

The purpose of this section is to outline natural and cultural heritage across the County, as well as its trans-boundary and regional context, which can support and influence the Green Infrastructure strategy. It provides an overview of the current policy and studies in the area, along with a concise spatial analysis of the County. This section also highlights the main challenges and opportunities for natural and cultural heritage for the County as they relate to GI.

Natural and cultural heritage encompasses both tangible and intangible inheritance from earlier generations. In broad terms it includes:

- Natural heritage: topography, climate, air, skyscape, landscapes, ecology and biodiversity and landscape management
- Cultural heritage: buildings, railways, harbours, piers, public realm, civic life, literature, music, visual art, language, folklore, traditions and landscape management



Photo 24: Feeding the ducks at Kilbogget Park.



Photo 25: Railings along Queen's Road, Dún Laoghaire.

2.3.1 Policy Context

Natural and cultural heritage is provided with policy and legislative protection from a wide variety of sources. European and national legislation provide the necessary framework for the protection of the natural and built heritage and this is supported by policy at national, regional and county level. The Green Infrastructure strategy will inform the Local Area Plans, and as a result the outcome of the strategy will be subject to environmental appraisal of the potential impacts.

The existing County Development Plan 2010-2016 plays a particularly important role in identifying and protecting heritage of varying significance. The plan promotes a close relationship between natural heritage, open space and access, and includes a strategic vision of 'Green Structure' (National Spatial Strategy). This is envisioned as a County wide landscape that reflects the multifunctional use and network character of Green Infrastructure. This is also supported in the policy to *'maintain and protect the natural character and ecological value of the river and stream corridors in the County and where possible to enhance existing channels and to encourage diversity of habitat'* (County Development Plan Policy LHB10: Rivers and Waterways).

County Development Plan Policy LHB10: Rivers and Waterways
'maintain and protect the natural character and ecological value of the river and stream corridors in the County and where possible to enhance existing channels and to encourage diversity of habitat'

The natural and built heritage is also a key aspect of the statutory current Local Area Plans in the County. These plans provide local objectives and provisions for the natural and built heritage.

This pro-active approach to heritage is in turn supported by other policies and actions such as those in the Open Space Strategy, the Cherrywood SDZ, and the 'Dún Laoghaire-Rathdown Heritage Plan 2013-2018'. The Heritage Plan sums up the context of heritage in the County: 'The Dún Laoghaire-Rathdown motto Ó Chuan go Sliabh- from the harbour to the mountains - defines the County in terms of its heritage.'

The Dún Laoghaire-Rathdown motto Ó Chuan go Sliabh- from the harbour to the mountains - defines the County in terms of its heritage.'

The Heritage Plan's Interpretation Programme can be supported by GI by making information on heritage more accessible across the County. Other projects include producing a heritage guide to the County's section of the Dublin Mountains Way, encouraging partnerships to

provide appropriate managed access to archaeological sites and national monuments, continuing to promote the unique heritage of the Martello Towers in the Dublin area, and promoting the marketing of the County's walled gardens.

Studies such as the 'Archaeological Survey' (2006) and the 'Industrial Heritage Survey' (2005-2006) cover the whole County, whilst the 'Habitat Survey' (2007), Historic Landscape Character Assessments' (2004-2008) in the current County Development Plan only focus on areas that are most vulnerable to development. The original Landscape Character Assessment was finalised in May 2002 and has subsequently been updated in the 2010 - 2016 Plan and also for the draft County Development Plan 2016 - 2022. The Department of Arts Heritage and the Gaelteacht's National Landscape Strategy for Ireland, 2014 - 2024, when finalised, is likely to include new guidance on carrying out LCA. It is envisaged that the existing assessment will be reviewed in due course to ensure consistency with any new forthcoming Government guidance.

2.3.2 Spatial Context

This section deals with the spatial context of the natural and cultural heritage components of Green Infrastructure which are of County-wide significance.

Geology

The granite geology of the underlying bedrock is expressed in the mountains, hills and foreshore and in built artefacts, appearing across the County, with some diversity in the limestone to north (referenced in the name of 'Blackrock') and Ordovician strata to the south.



Photo 26: Bullock Harbour.

Topography

There is a broad diversity of topography from mountains to the sea. The hills, mountains and sea are the basis of great views and prospects that consist of natural scenery, landmarks and historic landscapes. There are typically trans-boundary views into neighbouring counties and across Dublin Bay.

Land Use and Ecological Diversity

By virtue of its sea to mountain location, and urban/rural context, the County has a good diversity in land use, geology and ecology which includes: heath, wood/forestry, riparian corridors, foreshore, salt marsh, hedgerows, agricultural land, undeveloped land, parks, demesnes, gardens and green roofs and transport corridors.



Photo 27: Booterstown Marsh.

This broad range of land uses offer biodiversity, including 45 different habitats of which 7 are potential Annex 1 habitats (Dún Laoghaire-Rathdown Habitat Survey 2007). The survey focused on vulnerable lands to the south of the County. The habitats adjacent to the southern portion of the M50, west and east along the M11 and to the extreme west of the County are under greatest threat from future development, pollution events or destruction through agricultural, forestry or landfill impacts.

The survey identifies key corridors that connect the SAC, pNHA and SPA zones in the south west of the County eastwards towards the coast, with built development towards the north of the County causing fragmentation. Road infrastructure projects also create barriers to the connection habitats. Further fragmentation of ecological corridors would have a major negative impact on biodiversity within the County. More isolated, wilder locations, such as the Wicklow Mountains, can support a significant biodiversity resource, but even intensively managed and visited spaces can be invaluable areas for wildlife, particularly in developed urban and industrial regions, such as FitzSimon's Wood.





Photo 28: FitzSimon’s Wood.

Existing ecological receptors can constrain implementation and delivery of a Green Infrastructure strategy. The ecological impacts could, for example, be directly through loss of habitats via construction or management works, or more indirectly through increasing visitor numbers in areas inhabited by sensitive species, such as Merlin and Peregrine Falcons in the Wicklow Mountains or Tern species on the Dalkey Islands.



Photo 29: Dalkey Islands.

Rivers and Water

The rivers and streams generally traverse from mountains towards the sea. They are frequently inaccessible to the public, particularly where they are on private land beyond the M50 motorway. Over 70% of the watercourses in Dún Laoghaire-Rathdown are on private land. All of the 30km of watercourses upstream of the M50 or urban area are in private ownership. Institutional land (e.g. universities, colleges and hospitals) and outdoor sports facilities (e.g. golf courses) distributed throughout the County contain 13km of watercourses. This represents a significant area of privately owned green assets that could be created or enhanced. Accessibility and their ecological value are sometimes disrupted by culverts in built up areas. There is an inherent biodiversity value within the water resources of the County, including the main rivers and smaller watercourses, and wetland habitats.

Over 70% of the watercourses in Dún Laoghaire-Rathdown are on private land. All of the 30km of watercourses upstream of the M50 or urban area are in private ownership.



Photo 30: Little Dargle River running through Marlay Park.

The rivers generally have many built heritage elements such as bridges and weirs, and the Dodder, Owendoher and Loughlinstown/Shanganagh rivers in particular have mills associated with them.

Although the rivers and streams are often inaccessible along their routes through private land, steep topography and culverts, they are accessible in some key places. Regardless of public access, they are valuable corridors along which a number of species can move between areas.

A summary of the location of where each watercourse has an interface and accessibility with the public is shown in Table 2.B.

River Network	Public Interface
Little Dargle	Marlay Park
Dodder	Linear park with DCC
Slang	Dundrum and suburbs
Carrickmines	Jamestown Park
Shanganagh	Cherrywood
Clonkeen	Clonkeen and Kilbogget Parks
Glencullen	Wicklow Way (limited)

Table 2.B: Rivers and Public Interface

Coastline

The 17km of coastline consists mainly of rocky foreshore, with harbours, beaches, cliffs, salt marsh and islands. This diverse coastline offers natural and cultural heritage interaction – particularly through recreation. It also forms an important ecological corridor, where the isolation can offer protection to wildlife. Some urban areas, such as Dún Laoghaire harbour, cause fragmentation of this corridor, particularly on the landward side.



Photo 31: Sandycove.

The Dalkey Islands constitute a significant site of ecological, archaeological, architectural, and cultural heritage. It is a prime example where conservation of archaeology and natural heritage is aided by isolation. The adjacent island, The Muglins, is outside the Dlr boundary, but is within the Rockabill to Dalkey Islands SAC and the Dalkey Coastal Zone and Killiney Hill pNHA. The trans-boundary context of the coastline is also reflected in the proposal that the UNESCO North Bull Island Biosphere Designation be extended to cover all of Dublin Bay.

Parks, Institutional Lands, and Gardens

There are varying levels of access to public parks, institutional lands and private gardens, with strong cultural and natural heritage elements. For example, many large houses have grounds and parkland throughout the suburban areas, some of which have become public, most notably at Cabinteely and Marlay parks. 'Parklife' is an active management plan instigated by Dlr Parks and Landscape Services for increasing biodiversity in public parks, an important factor for enhancing natural heritage in Green Infrastructure. Clusters of houses with large private gardens occur across the County, but most notably in the Killiney/Dalkey area where they have substantial tree coverage.



Photo 32: Cabinteely House, Cabinteely Park.

Trees, Forestry and Woodland

Tree habitats range from coniferous plantations, deciduous woodland, and those in streets, parks, institutional and private grounds. Collectively, this urban woodland and should be managed to ensure a balanced age profile and appropriate mix of species.

Hedgerows

Agricultural hedgerows located mainly in the south and west, are important on a County level. They are significant elements of ecological corridors, and embody cultural heritage as townland and field boundaries, and in landscape management.



Photo 33: Woodland in Marlay Park.

Transport and Heritage

Strong cultural heritage occurs in transport corridors with nodes for access. This heritage infrastructure of transport includes bridges, boundaries, tunnels and cuttings. For example, the Luas green line, some of it aligned on the former Harcourt Street line, includes the Nine Arches stone viaduct. The Metals, running parallel to the national railway, is a good example of a composite GI corridor, combining a cycle and pedestrian route connecting open spaces and stations, with natural heritage, built industrial heritage and cultural memory. Railway and motorway embankments are examples of inaccessible ecological corridors if they are not isolated by boundaries and have the possibility to link across junctions.



Photo 34: Nine Arches at Dodder Valley Linear Park.

Source: Wikipedia. Image By: Suckindiesel.



Archaeology

There are over 400 archaeological sites and protected monuments sites across the County, ranging from not visible to fully accessible. The most important and accessible have heritage trails proposed in the Archaeological Survey 2006. These are:

- Dalkey Islands Trail – noted in the survey as the ‘flagship’ archaeological park in the County
- Coastal Fortifications Trail – the best surviving group of Martello towers and forts in the world
- Upland Trail - prehistoric monuments and industrial heritage; and
- Ecclesiastical Trail - early Christian and medieval monuments

The trails illustrate the spatial clusters that occur, such as along the coast and in the uplands, as well as themes such as churches and industrial heritage, often associated with river or transport corridors.



Photo 35: Kilbogget Park.

Protected Structures

There is a wide variety of protected structures in urban, coastal and rural areas. Architectural Conservation Areas and areas with large protected houses and gardens can collectively create zones of managed habitat, and urban woodland, typically towards the coast around Dalkey and Killiney. Open spaces are often associated with the protected terraces and squares, such as Belgrave Square, Clarinda Park, Crosthwaite Park and Royal Terrace. These are designated as local parks, and provide a finer grain for the GI strategy to work with.



Photo 36: The Metals at Claremont Villas.

Literature

There is a rich literary tradition in the County, focussed on 20th-century writers such as James Joyce, Samuel Beckett and Brian O’Nolan who all reference the locality in their works. Their descriptions of places and journeys, which are unique to the County, give a strong value to the cultural heritage of the County.

Visual Art and Heritage

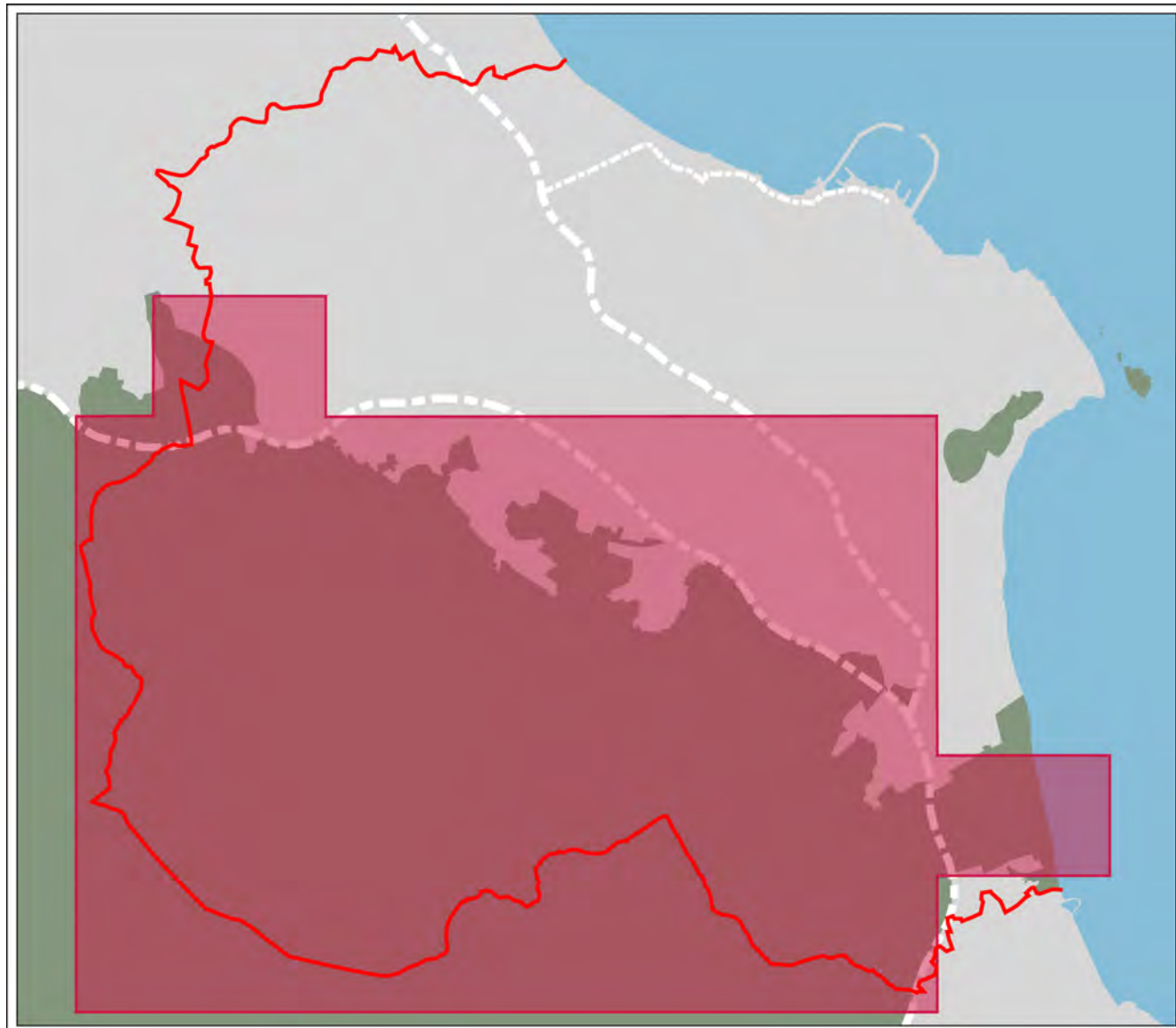
The Dún Laoghaire-Rathdown Sculpture Trail identifies 39 pieces of public sculpture, mainly 20th century. There are also many heritage artefacts which are accessible through the publications ‘Did You Know’ (Dlr 2009) and ‘In Honour and Memory’ (Dlr 2013). The latter are spread through much of the older urban areas. The artworks start to form clusters in Marlay Park and along Dún Laoghaire seafront.



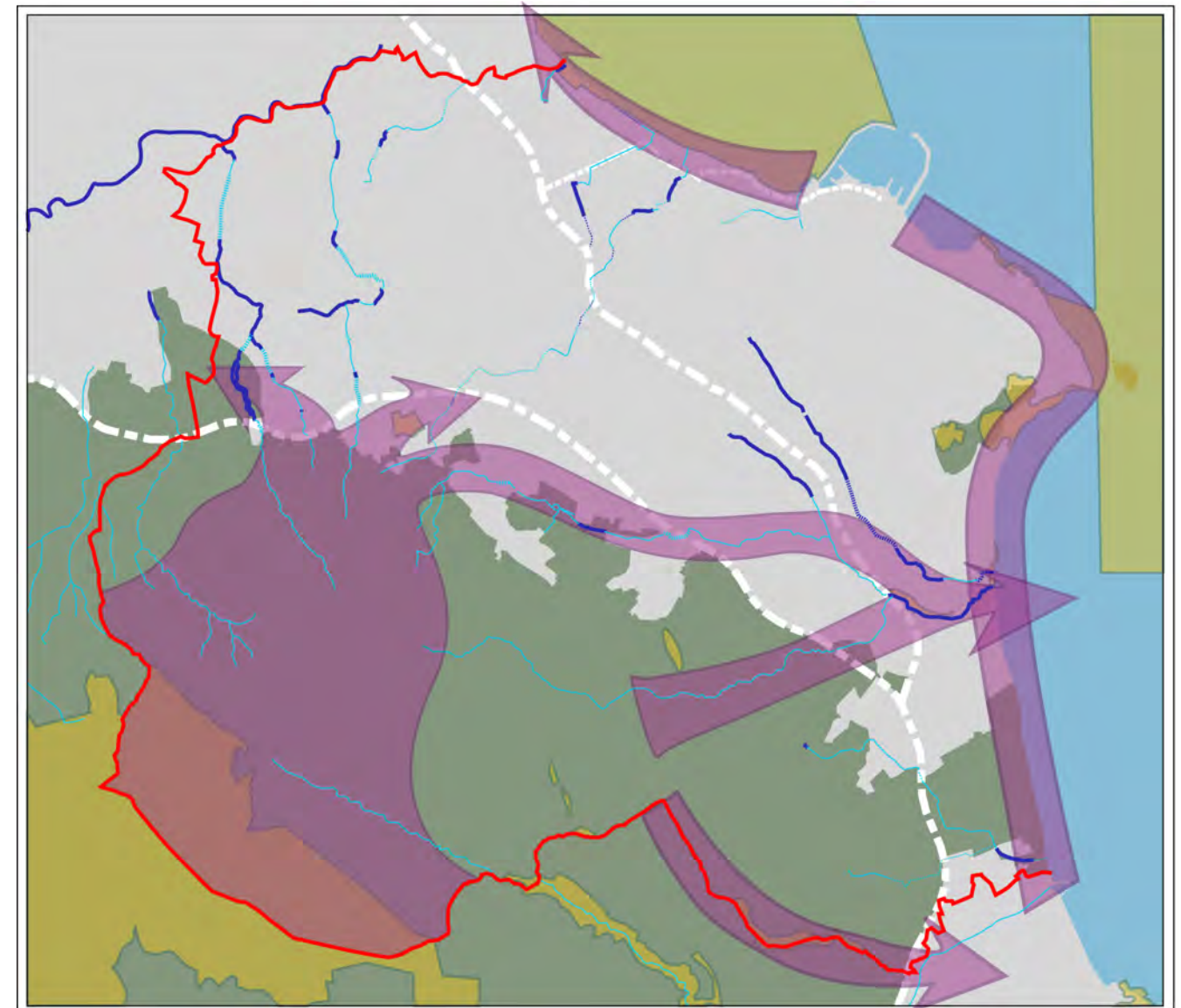
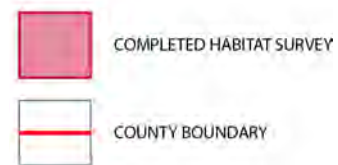
Figure 2.E: “Did You Know?” Dún Laoghaire-Rathdown Publication

Skyscape

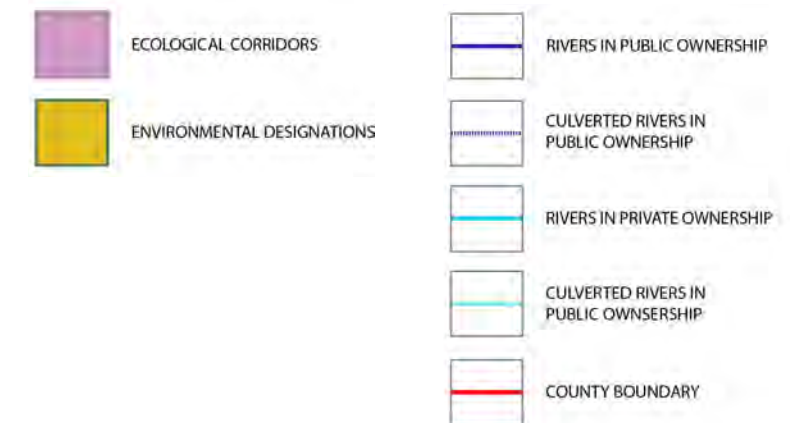
The coast, hills and mountains are good vantage points for viewing dramatic skies. The light pollution policy EI17 of the County Development Plan (2010-2016) identifies light spillage and pollution as a threat to wildlife and reduces the visibility of the night sky. However, a strengthening of policies and actions related to light pollution and the night sky in particular would reinforce a dimension of natural and cultural heritage in Green Infrastructure that is readily accessible. The visibility of the night sky is also culturally relevant for the association of the astronomer Lady Margaret Huggins and astronomer instrument maker Sir Howard Grubb had with the County.

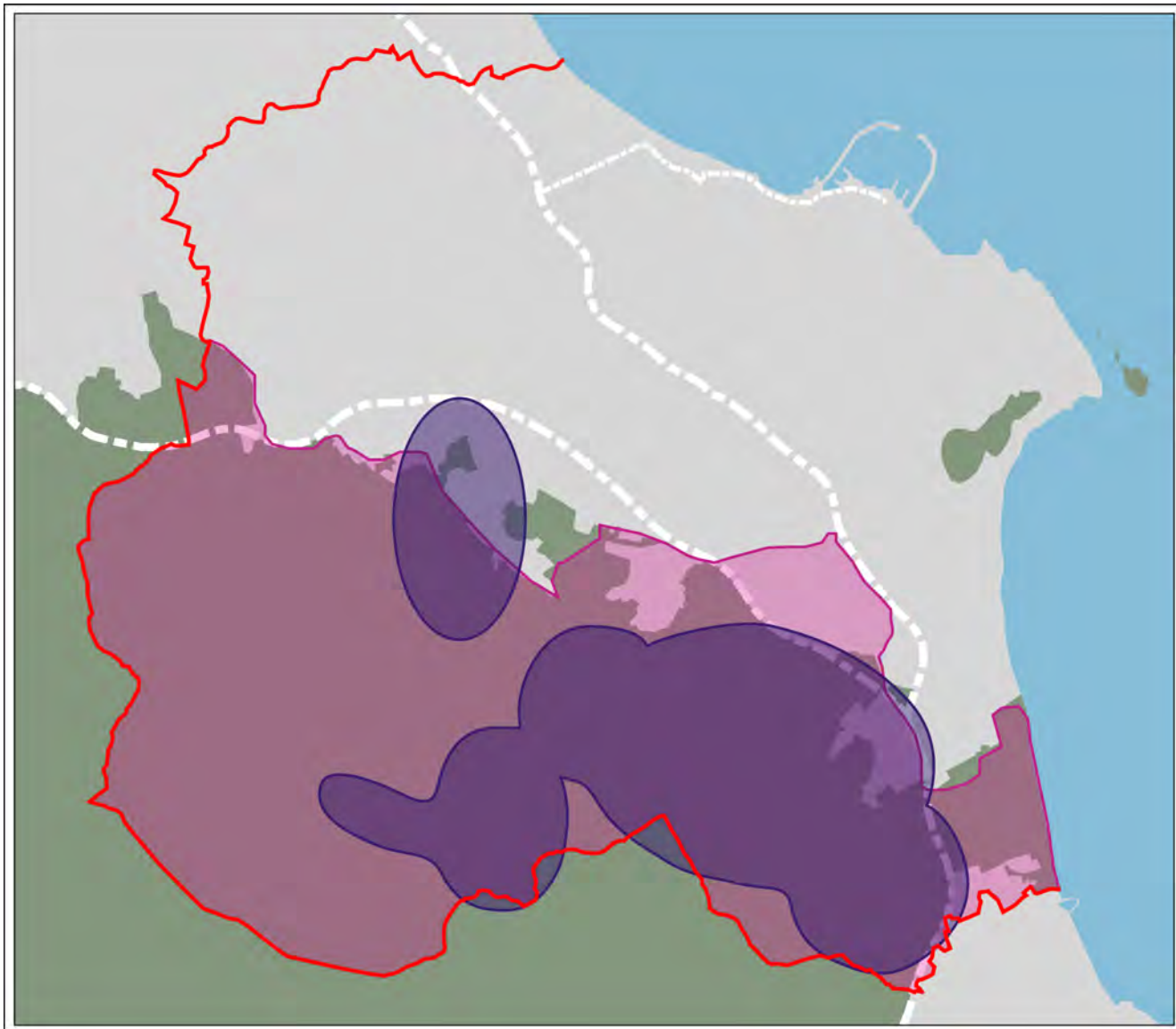


Map 10: Completed Habitat Survey in the County.

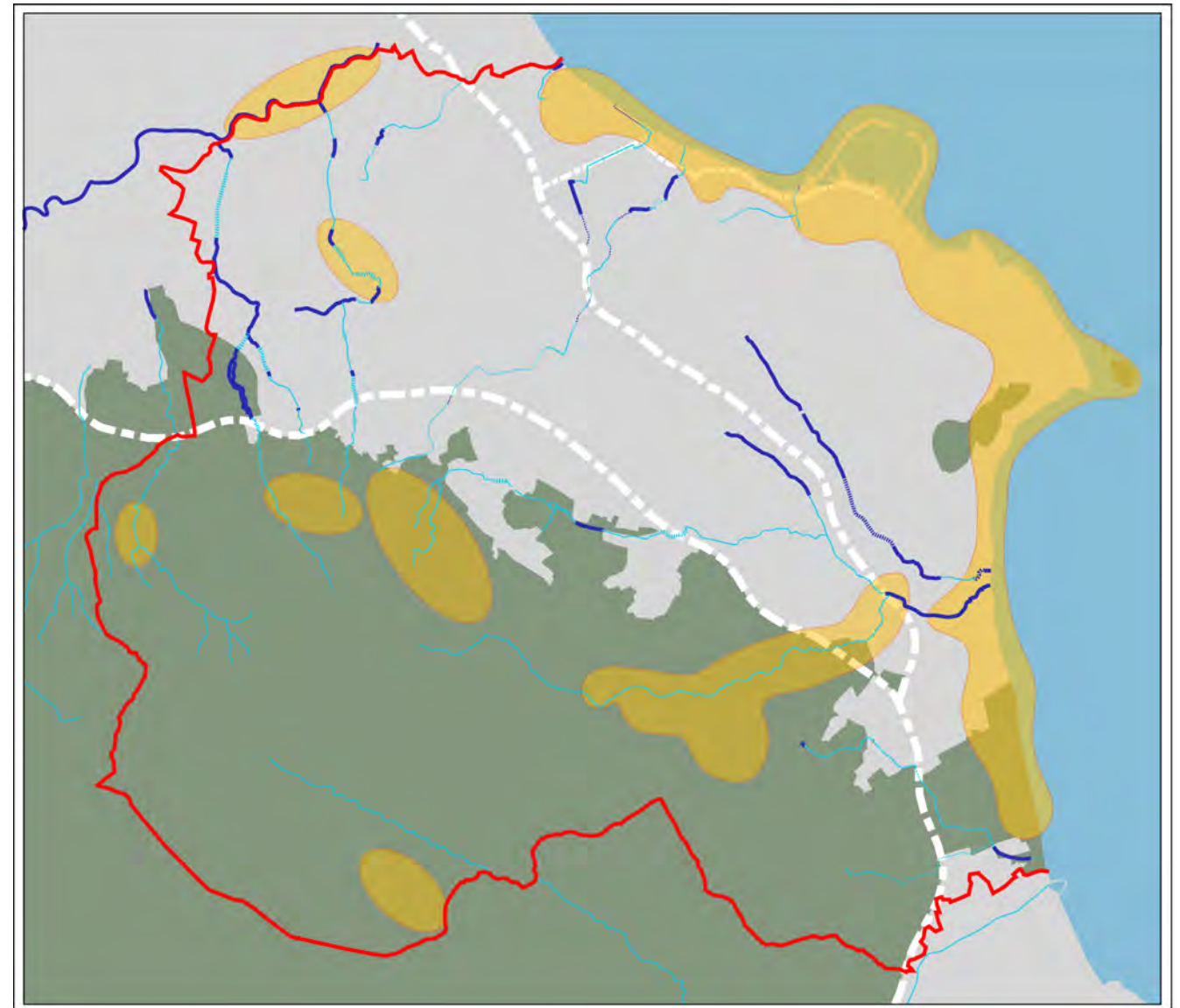
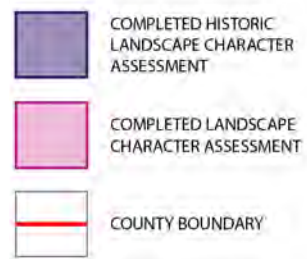


Map 11: Ecological Corridors with Environmental Designations and Rivers in the County.

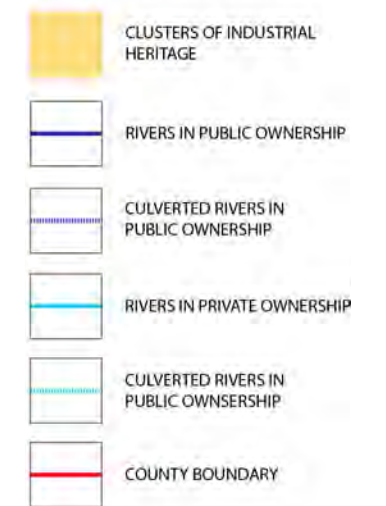




Map 12: Completed Historic Landscape Character and Landscape Character Assessment in the County.



Map 13: Clusters of Industrial Heritage with Rivers in the County.



2.3.3 Challenges and Opportunities

A number of challenges and opportunities for the Green Infrastructure strategy have emerged from the policy and spatial analysis of natural and cultural in Dún Laoghaire-Rathdown.

Challenges

In general the policy context for Green Infrastructure in the area natural and cultural heritage for the County is robust. However, key challenges for current and future policy are evident and these include:

- Gaps in data should be completed, including historic and landscape character assessments, tree cover and biodiversity mapping which should extend along the coast and into the urban townscape.
- There will be a challenge in communicating to the general public the benefits and needs of different environments on habitats for example, which might impact on the general public's perception of maintenance and management.
- Writing policies relating to the more intangible cultural and heritage assets such as literature, visual arts and skyline, to use them to use as a unique asset provision in GI which is specific to the County.
- Developing suitable policies for opening culverts, or managing water on private land and to improve or maintain ecological corridors through policies separate to the planning system.
- Writing policies to encourage landowners to manage their land in ways which will protect and increase biodiversity.
- Finding a balance between the policies that aim to enhance public access and those that protect sensitive areas and restrict therefore access.

The spatial context for natural and cultural heritage for the County, presents some key challenges. These are:

- Making archaeological sites and monuments in public and in private ownership appropriately accessible.
- Public access and the protection of biodiversity can conflict, especially at sensitive sites and can vary seasonally.
- Barriers to GI corridor connections such as crossing points to main roads, M50 or N11 or DART lines need to be overcome.
- The development of GI needs to consider protected sites, species and habitats at all stages (strategy, policy, feasibility, design and construction). Good design can avoid the need for mitigation measures which could constrain strategic objectives.

Opportunities

Natural and cultural heritage in the County presents some key policy opportunities. These are:

- Preparation of a single GI strategy with a coherent set of planning policies and objectives around natural and cultural heritage for the County.
- Guide the relevant sections of the County Development Plan, in particular the Landscape, Heritage and Biodiversity, the Open Space and Recreation, Social Infrastructure and Community Development sections.
- The opportunity to inform and provide a method for consistency by which GI strategies for natural and cultural heritage are incorporated into LAPs, SDZs, Framework Plans and other local policy documents.
- Policies to improve water quality through GI provision will have a direct impact on the status of protected and non-protected habitats, especially the South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA.

The spatial context for natural and cultural heritage in the County presents some key spatial opportunities. These are:

- Historic Landscape Character Assessments and Habitat Surveys will be informed and prioritised by the context of the GI strategy, and review Landscape Character Assessment,
- The civic culture of the urban area, sandwiched between the rural landscape and the coast has given a strong cultural aspect to the County which can be used to enhance GI. In particular, local context of writers and their descriptions of local places, and locally inspired visual art and monuments are readily available to be integrated into GI projects.
- Create a network of Greenways and access routes which also acts as ecological corridors and enhance biodiversity;
- Use new developments to enhance the network of GI, including biodiversity, creating ecological corridors and drawing on cultural heritage.
- A network of Green Streets and green roofs can create links to the strategic GI network, and mitigate fragmentation of ecological corridors, with cumulative benefits. Green roofs can create a haven for wildlife away from busy streets and reduce runoff.

2.4 Water Management

This section presents the different spatial and temporal scales at which water management contributes to the development of the strategy for Green Infrastructure in Dún Laoghaire-Rathdown. The 4 subjects addressed in this theme are:

1. Water quality
2. Flood risk
3. Trans-boundary connections
4. Spatial zones

The section also covers the current and future water management challenges and opportunities for the strategy.

The section also covers the current and future water management challenges and opportunities for the strategy. Catchment Flood Risk Assessment and Management (CFRAM) is currently being carried out for the Eastern Region - which includes DLR. The Eastern CFRAM's are still being finalised and are not yet in the public domain, although the Dodder CFRAM was completed as part of an earlier pilot study. The Dodder maps along with the Preliminary Flood Risk Assessment (PFRA), the Greater Dublin Drainage Study and the Irish Coastal Protection Strategy Study (ICPSS) have informed this strategy.



Photo 37: Attenuation Feature at Honeypark, Glenageary.



The Dublin Bay coastline, rivers and storm drainage system are critical components of the Dún Laoghaire-Rathdown Strategic Green Infrastructure Network. The river corridors form natural connections linking urban areas with the upland mountains and the coast and flow through most of the regional parks. The GI strategy can set a framework for further reducing flood risk, improving water quality and optimising wastewater treatment. Examples of GI which provide water management functions include:

- River restoration to return watercourses to more natural forms. Features include the creation of buffer or filter strips along river banks, re-creating natural in-channel river features and opening culverted watercourses.
- Wetlands, attenuation and infiltration ponds to reduce downstream flood risk and improve water quality.
- Sustainable Drainage Systems (SuDS) as part of new developments, re-development and retrofit to existing development. SuDS include features to manage runoff and water quality at source in both the public realm and on private land. SuDS features can be located in the public realm (ponds, detention basins, infiltration basins, infiltration trenches and engineered swales, underground modular systems and tree root structural cell systems) or within development site boundaries (green roofs, pervious paving (grilles, gullies, etc.), infiltration trenches, detention basins, swales, water butts, tree root structural cell systems and rainwater harvesting).
- Green Streets to include SuDS features to restrict or delay runoff from streets entering the storm drainage network. The concept is to treat water at source and reduce flooding by managing runoff rates in rivers and storm drains.



Photo 38: Water Management at Clonkeen Park.

Strategic County-wide Green Infrastructure measures such as creating wetlands and linking recreational access, biodiversity and river corridors can provide the framework for local GI activities. Local GI measures at the street, building or development site scale, such as Green Streets, green roofs and SuDS can link to the County-wide strategic GI network. The cumulative benefits of local GI measures can deliver County-wide benefits by reducing overall flood risk and contribute to regional and city wide wastewater treatment strategies.

2.4.1 Policy Context

Current Greater Dublin drainage strategies look to address water quality and runoff management at the point of discharge through wastewater treatment. There are however intermittent spills of foul sewage from the combined sewer network which occurs during high rainfall events. Retro-fitting existing urban areas or providing SuDS for new development can strategically reduce runoff rates and volumes entering the drainage network and reduce the risk of pollution.

The planning policies and development control in Dún Laoghaire-Rathdown recommend the implementation of SuDS as part of new developments and re-development. Green roofs are promoted and as part of Strategic Development Zone specific objectives are in place to limit the rate of runoff, provide water runoff treatment stages and consider exceedance of the drainage system in extreme storms. The adoption of SuDS features is managed through the planning process as an agreement with the developer on a site by site basis. In dense urban areas, the design standards for redevelopment need to reflect the potential to reduce runoff on a more pragmatic basis.

The management of surface water runoff and discharges from combined sewer overflows will remain with the local authority remit. The Green Infrastructure strategy will be useful means to coordinate and achieve multiple benefits in the management of water quantity and quality by integrating these measures into parks or linear corridors.

Flood risk from rivers and the sea is currently being addressed through the national programme of Catchment Flood Risk Assessment and Management Plans. Flood alleviation and coastal protection schemes in high priority locations will be able to draw on national capital funding, however addressing local flood risk will likely remain the responsibility of Dún Laoghaire-Rathdown.

The temporal scale of when water management related Green Infrastructure measures can be implemented, has a strong spatial element in that land ownership determines how, where and when these measures can be implemented. Some long term objectives may require changes to legislation, regulations or more certainty in funding and charging for water services before they can be achieved. The planning process can be used as a tool to implement short and long term objectives of the strategy.

2.4.2 Spatial Context

This section deals with the spatial context of the 4 water management components of Green Infrastructure which are of County-wide significance.

Water Quality

The rural upland watercourses in Dún Laoghaire-Rathdown generally have good water quality but many of the urban rivers have poor water quality (Eastern River Basin Management Plan www.wfdireland.ie). The threats to achieving good surface water quality include the risk of combined sewer discharges and runoff from agricultural and urban land containing pollutants and contaminated sediments. Poor water quality in the streams discharging into Dublin Bay results in the occasional closing of Killiney and Seapoint, both Blue Flag bathing water beaches. It also has an impact on the ecological potential of the watercourses throughout the County.

Flood Risk

Despite being a coastal area, there is very little coastal flood risk in Dún Laoghaire-Rathdown, however there are significant coastal protection assets to manage the risk of coastal erosion. The principal flood risks are from fluvial, groundwater, pluvial, sewer and blockage of key structures. Throughout the County residential, commercial and key strategic infrastructure (main roads, DART and Luas lines) are at risk of flooding. A current joint flood risk study between Iarnród Éireann and DfI is underway.

Climate change will increase the intensity and seasonality of rainfall and increase sea levels and storm intensity. Green Infrastructure has a significant role in preparing and mitigating the impacts of climate change.

Trans-Boundary Connections

A number of water features link Dún Laoghaire-Rathdown to neighbouring areas. These connections include the Dublin Bay coastline, the Glencullen River which flows from Dún Laoghaire-Rathdown into County Wicklow and the River Dodder which forms the boundary with Dublin City. The water supply for Dublin as a whole is from outside of Dublin. The Shanganagh Treatment Works treats foul and combined sewers from Bray in Wicklow. Some of the foul and combined sewer flows originating in Dún Laoghaire-Rathdown are treated elsewhere in Dublin.

Spatial Zones for Water Management

The analysis shows the water management issues in Dún Laoghaire-Rathdown vary across the whole County. Four water management zones for the assessment of GI have been identified where different measures are suitable to address the issues present in each zone. It also allows priorities to be assigned and provides the focus for development management discussions on the use of different SuDS techniques, particularly Green Roofs and Green Streets.

Over 70% of the watercourses in Dún Laoghaire-Rathdown are on private land. All of the 30km of watercourses upstream of the M50 or urban area are in private ownership.

Over 70% of the watercourses in Dún Laoghaire-Rathdown are on private land. All of the 30km of watercourses upstream of the M50 or urban area are in private ownership. Institutional land (e.g. universities, colleges and hospitals) and outdoor sports facilities (e.g. golf courses) distributed throughout the County contain 13km of watercourses. This represents a significant area of privately owned green assets that could be created or enhanced. These zones are summarised below.

Zone A: Upland Catchments and Streams

This area is characterised by steep slopes, outdoor recreation activities with forestry, agricultural and heathland as the predominant land use. Depending on season and crop or forest cover these areas have the potential for rapid runoff response to rainfall and are sources of sediment and agricultural pollution to watercourses. Most of the land is in private ownership. In this Zone Green Infrastructure could assist in managing or intercepting the sediments and debris that are washed off downstream into the urban area. There is also the potential to hold flood waters back within parks, and drainage ditches on the mountains.



Photo 39: Zone A, Upland Catchments and Streams.

Zone B: Loughlinstown, Deansgrange, Foxrock, Carrickmines and Shanganagh River Corridors

These river corridors contain urban watercourses with poor water quality and areas at risk of flooding from rivers and blockage of structures on these watercourses. Pollution from urban drainage systems connected to the river to relieve flooding on the sewer system and from dumping of rubbish in the watercourses are prevalent. There are many parks, open spaces and Greenways along the watercourses, which can be used by Green Infrastructure techniques to address these issues. The Shanganagh and Carrickmines Rivers have some well-defined river corridors, such as the Druids Glen ecological buffer zone protected in the Cherrywood SDZ. There are some reaches where the rivers are culverted under main roads (including the M50, N11 and busy junctions) and the historic landfill in Kilbogget Park. Some development has encroached on the natural river corridor and floodplain. In this zone Green Infrastructure would be targeted treating combined sewer overflows by retrofitting at their outfalls with wetlands and/or intercepting rainfall before it enters the sewer network with swales and other means of infiltration or at the very least attenuation within SuDS.



Photo 40: Zone B, Deansgrange Stream in Kilbogget Park.

Zone C: Little Dargle, Slang and the Dodder River Corridors

These river corridors are similar in nature to those in Zone B, however they contain some significantly long culverts. The Little Dargle flows through Marlay Park, Broadford Park and Loreto Park. Green Infrastructure would seek opportunities to open up these culverts and reconnect the riverine habitats.

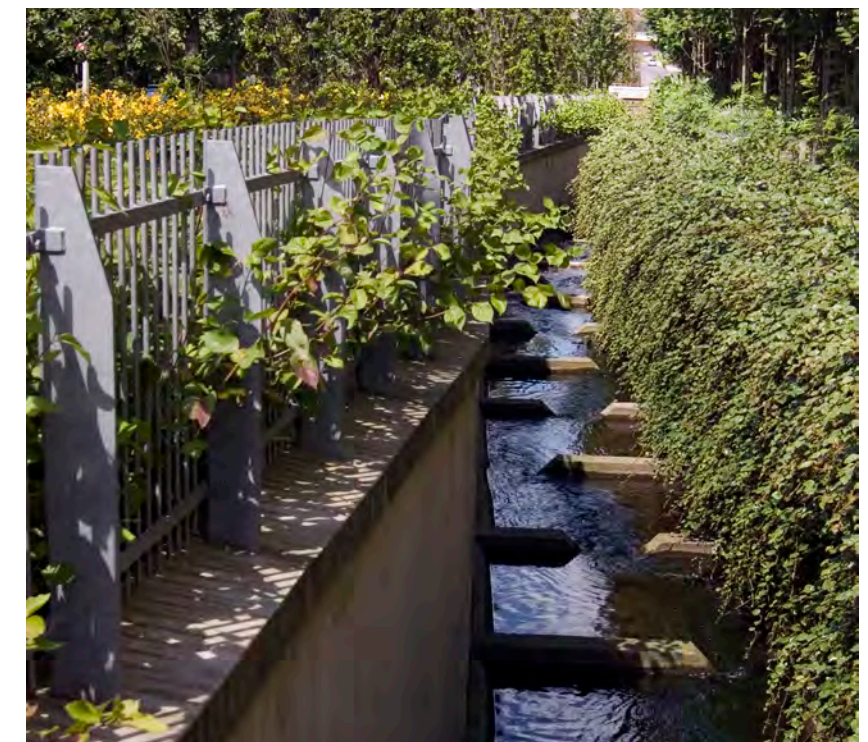


Photo 41: Zone C, Slang River.

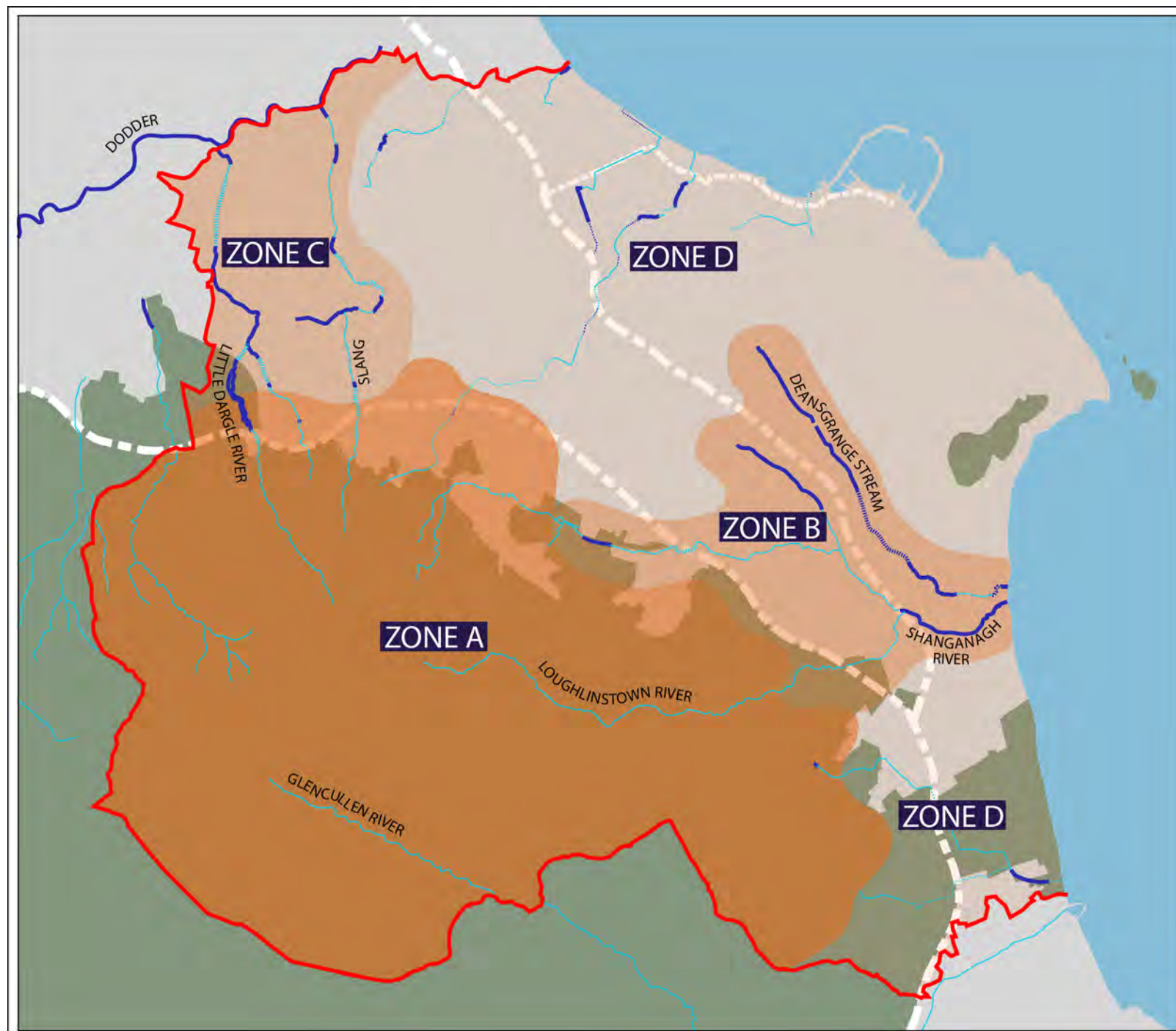
Zone D: The Urban Area Drained by the Surface Water and Combined Sewer Networks

Throughout the urban areas away from the river corridors there is limited open space along natural runoff routes. Natural run-off routes have often been replaced by underground surface water and combined sewer networks. However, many routes have been diverted, so that when excess rainfall is experienced in the pipe or culvert the original route for overland flow manifests itself. There are localised areas at risk from surface water flooding and nine Combined Sewer Outfalls (CSOs) discharge into Dublin Bay via watercourses where GI can help improve bathing water quality.

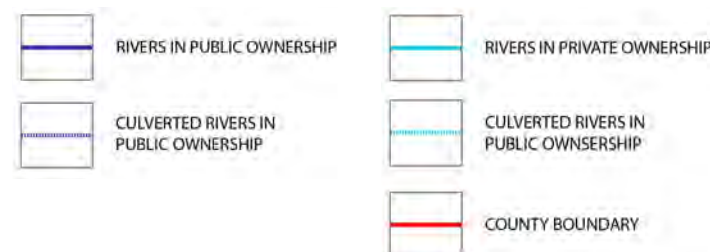


Photo 42: Zone D, Surface Water Runoff.
Source: Wikimedia by Robert Lawton.





Map 14: River Zones.



2.4.3 Challenges and Opportunities

A number of challenges and opportunities for the strategy have emerged from the policy and spatial analysis of water management in Dún Laoghaire-Rathdown.

Challenges

In general the policy context for Green Infrastructure in the area of water management for the County is robust for new development, but management of flood risk and water quality for the existing urban areas is problematic. GI offers some local and strategic benefits that have the potential to improve the existing situation and/or reduce the impacts of climate change. However, a key challenge for current and future policy are the significant barriers in the management of runoff and enhancement of the GI function on private land, primarily above the dense urban areas. It may be necessary to look at policy responses in this area utilising EU-level agricultural land use and environmental policies and local initiatives. Natural flood management concepts and use of Natural Capital accounting techniques may provide a catalyst for this change.

The spatial context for water management for the County, presents some key challenges. These are:

- The many locations where culverts and development encroach on the river channel and break the continuity of the river corridor and undermine their multi-functional space and ecosystem services.
- The many locations where a lack of space in existing streets and built up areas presents a major challenge for GI initiatives alongside watercourses.
- The current flood risk in urban areas and development pressure within the urban area and on the rural-urban fringe.
- The medium to long-term challenges include climate change which will impact upon the coastline, runoff response in upland areas and increase flood risk to urban areas and more frequent spills from combined sewer overflows.

Opportunities

The policy context for water management in the County presents some key opportunities. These are:

- The opportunity to inform and provide a method for consistency by which GI strategies for water management are incorporated into LAPs, SDZs, Framework Plans and other local policy documents.
- Preparation of a GI strategy that addresses water management with a coherent set of planning policies and objectives for the County.
- Planning and development control policies can create a framework for water management using all forms of GI as part of new development and re-development/retrofitting.

- Integrated policies can be introduced to manage water quality and flood risk using features which also provide recreation, amenity and biodiversity benefits.

The spatial context for water management in the County presents some key opportunities. These are:

- River corridors are one of the natural foundations for multi-functional GI corridors and can ensure that when drainage systems are exceeded the impacts of flood events (such as July 2013, October 2011 and July 2009) are reduced.
- Managing runoff at source, storage ponds and wetlands at the foot of hills can improve downstream water quality, reduce the loading on waste water treatment and combined sewer overflows and also manage flood risk.
- Local SuDS, Green Streets and green roofs can create new and enhance existing links to a County-wide GI network and provide cumulative water quality and flood risk benefits.
- The GI strategy could provide a framework for enabling SuDS to be located in the public realm where space is not available in re-development sites or it is not economically attractive.
- Gaps in river corridors caused by culverts and encroachment by built development can be compensated for through the use of Green Streets and SuDS features.

2.5 Summary

The analysis shows that the current Green Infrastructure asset base is well distributed, and has both local and regional status which will be important to capture in the strategy. The green space provision allows for a diverse range of activities and functions and is well placed to be enhanced to yield the multi-functional benefits that a coordinated GI strategy can deliver. An opportunity is identified from the analysis to enhance the transition between rural and urban areas with better connections and hubs. The main barrier to GI is overcoming the physical barriers and access over private land to provide an integrated network of green spaces and corridors.

This network is fundamental to Green Infrastructure, for both humans and biodiversity. These could be formed across the County linking open spaces within the urban areas to the coastal and uplands landscape, but using strong ecological corridors formed by the river network as a backbone.

The proposed cycle network also forms another base that could influence the location of the Green Infrastructure corridors. There are significant economic and well-being benefits identified in the analysis, which provides a broad policy and strategic support for the strategy.

There is a broad scope in the challenges and opportunities identified across the 3 main themes, both in policy and spatial context to

drive Green Infrastructure forward within the County. The draft County Development Plan 2016 - 2022 recognises the overarching nature of GI. The multi-functional and multi-disciplinary nature of GI means that the strategy can inform the policies and objectives of the statutory County Development Plan across Landscape, Heritage and Biodiversity, Open Space and Recreation, Water Management, Social Infrastructure and Community Development, and Sustainable Travel and Transportation sections. For instance, integrated policies can be introduced to manage water quality and flood risk using features which also provide recreation, amenity, cultural and biodiversity benefits.

The analysis also identified that drawing on the cultural and natural heritage aspects of the County, the Green Infrastructure strategy can be further enhanced as it is developed into local plans. For instance, the trails proposed in the Heritage Plan, the wealth of industrial heritage artefacts and the strong civic culture manifest in literature and visual art offer unique and specific elements to strengthen identity and sense of place ('genius loci').

These composite opportunities will be developed in the strategy, similar to the multi-functionality of Green Infrastructure where the whole is greater than the sum of all the individual parts.

"An approach to planning and development that recognises the social, environmental and economic value of Green Infrastructure (could) not only increase access to public green space, but help make urban areas more resilient to climate change."

**Tony Juniper,
"What Has Nature Ever Done For Us?" (2013)**







Photo 43: People's Park, Dún Laoghaire.

3. Strategy

3.1 Introduction

The vision and principles set out a longer-term perspective for Green Infrastructure in Dún Laoghaire-Rathdown and underpin the strategy. The strategy has three GI themes which were established during the preparation of this project. These themes are brought together in a single, **integrated spatial framework**. This spatial framework consists of different elements and components.

The strategy is based on the main themes described in the analysis. These are:

- Accessibility, recreation, health and well-being
- Natural and cultural heritage
- Water management

3.1.1 Accessibility, Recreation, Health and Well-Being

The strategy has identified the **key thematic objectives**:

- **Develop the public parks at the threshold of urban and rural areas into 'Gateway parks'**. These parks should function as starting points which facilitate and encourage people to visit rural areas and connect to the Dublin Mountains Way and the Wicklow Way. They should also be welcoming for people coming back to the urban area after hiking or cycling. As such they could accommodate bike parking, café and toilets, and way-finding signage. They should also be multifunctional hubs, connecting ecological corridors, facilitating interpretation of natural and cultural heritage, and the management of water from the uplands entering the urban areas.
- **Improve sections of the Wicklow Way and Dublin Mountains Way where they occur along stretches of road**. The rural road network in the upland areas has the potential to be used by greater numbers of walkers and cyclists as Green Infrastructure routes in themselves, complementary to the extensive network of off-road walking and hiking trails. Traffic volume and speed is the main issue to be addressed, but if these issues can be quantified and any safety issues addressed in terms of traffic management measures, then on road routes could form part of the rural network.



Photo 44: Airfield Trust, Dundrum.

- **Create new and improved connections between open spaces to generate a network of spaces across the urban areas**. Develop Greenways between local parks to complete multifunctional corridors to open space hubs and the coast.
- **Improve links within urban areas to encourage day-to-day use**. This should facilitate journeys to and from home, work, and education particularly for walking and cycling.
- **Improve links across transport infrastructure where there are barriers to movement**. Barriers have been identified along the M50 and M11 and R113/N31, across urban areas, and from urban areas into rural areas. Use these opportunities to enhance the multifunctional character of these routes by completing fragmented ecological corridors, engaging with cultural heritage and introducing water management features.
- **Improve pedestrian and cycle links across railway barriers**. These include links such as the DART and national railway line, to the coast. Generous access points with facilities for bikes will improve access along stretches from Booterstown Marsh to Dún Laoghaire, and along Killiney strand. Crossing points between Booterstown Marsh and Seapoint, and at Killiney strand are limited to narrow footbridges with steep steps, or narrow access points.
- **Improve links to the Green Infrastructure network from public transport**. Connecting Greenways to Luas stops, DART stations and bus stops will encourage access to the mountains, coast and the major parks and open spaces.
- **Address the uneven distribution of allotments or community gardens**. These should be accessible from areas of high residential density to improve health and well-being and social cohesion.

3.1.2 Natural and Cultural Heritage

The strategy has identified the following key thematic objectives:

- **Review and/or Complete Landscape Character Assessments and Continue Historic Landscape Character Assessments**. These should inform the conservation of local character and identity for new development, and strategic and local Green Infrastructure.
- **Complete Habitat Assessments and implement the County Tree Strategy**. This should be done by completing County-wide urban tree population surveys to inform strategic and Local Area Plan Green Infrastructure. It should be focused on the conservation of natural habitats, for example along water courses and in woodlands, where greater public access or water management is being considered. Encourage the use of native species of local provenance to strengthen ecological corridors, particularly in relation to grassland and meadow habitat, marginal planting, hedgerow and woodland planting.



Photo 45: Dalkey Castle, Castle Street, Dalkey.



Photo 46: Heron on Booterstown Marsh.
Source: Wikipedia. Image By: Albert White.

- **Restore or mitigate the fragmentation of ecological corridors throughout the County.** This should focus on corridors from rural areas through urban areas to the coast, and also along the coast. These corridors may serve a single function in the Green Infrastructure network. However, water management and the landscape management associated with public access can enhance biodiversity and reinforce the multifunctional uses of the corridors.
- **Create a network of Greenways, Green Streets, including green roofs.** These should also act as ecological and water management corridors to enhance biodiversity, water quality and reduce flood risk.
- **Utilise the strong built heritage of the County.** This should include archaeology, national monuments and protected structures. Appropriate access to archaeological sites, monuments and protected structures on private land may be facilitated as part of the GI network. Industrial, ecclesiastical and transport heritage in GI corridors should be interpreted and used to reinforce identity and a sense of place.
- **Utilise the strong cultural heritage of the County.** This can sometimes include intangibles such as visual art, literature and science. New sculptural work in public spaces should incorporate local meaning and interpretation and draw on local literature.
- **Use new developments to enhance the Green Infrastructure network.** This should include biodiversity, new access and recreation and water management.



Photo 47: Wetland Attenuation Pond in Clonkeen Park.

3.1.3 Water Management

The strategy has identified the following key thematic objectives:

- **Utilise rivers and streams as one of the natural foundations for multi-functional Green Infrastructure corridors,** and address barriers such as culverts and land ownership where practicable. Green Street and SuDS features should be investigated to compensate for gaps in river corridors caused by culverts and encroachment by development.
- **Use GI features to ensure** that when drainage systems are exceeded the impacts of flood events and operational costs to key transport (e.g. DART, Luas) and utility infrastructure (e.g. Shanganagh Wastewater Treatment Plant and sewer networks) are reduced.
- **Reduce the rate, volume and improve the quality of surface water** runoff entering watercourses, the sea and sewer networks through GI, including reductions in runoff and sediment from upland areas flowing into the urban area. Seek to minimise erosion in the GI to conserve soil quality.
- **Manage runoff at source by creating storage ponds and wetlands above the urban area** to improve downstream water quality, reduce the loading on wastewater treatment and manage flood risk.
- **Use local SuDS, Green Streets and Green Roofs** to create new and enhanced existing links to a County-wide Green Infrastructure network and provide cumulative water quality, biodiversity and flood risk benefits.

- **Enable SuDS to be located in the public realm** where space is not available in re-development sites or it is not economically viable.
- **Encourage the use of water to generate energy on a micro level,** utilising water bodies for hydrothermal generation and water power for turbines in appropriate locations where energy can be harnessed without adversely affecting local habitat.

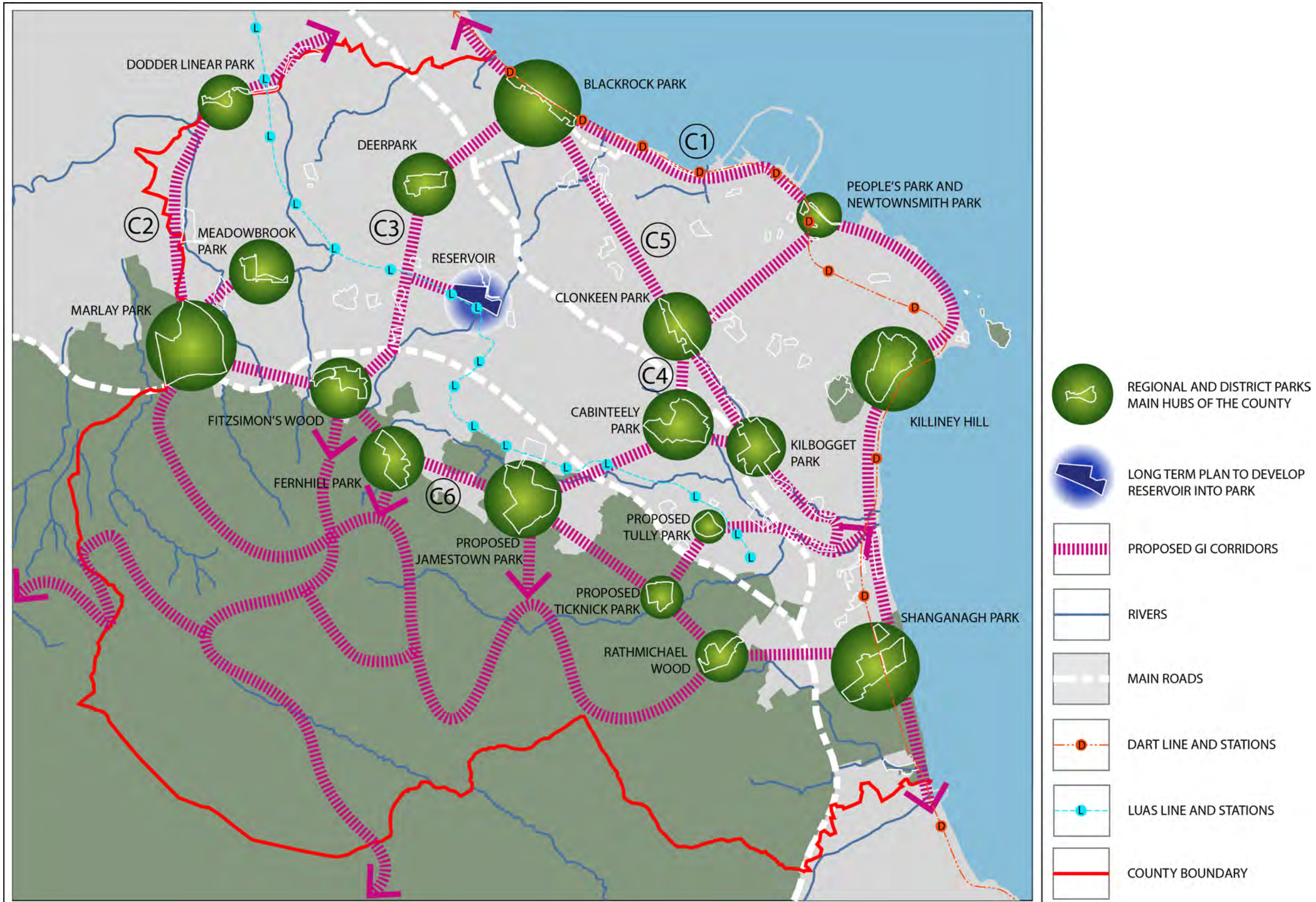
3.2 A Spatial Framework for Green Infrastructure in Dún Laoghaire-Rathdown

An essential part of any Green Infrastructure strategy is the spatial framework. It provides a way of simplifying what can often be sets of very complex systems. It also provides an understandable structure on which priorities and actions can be based. The framework spans the short (2015 - 2018) to long-term (2019 - 2022) time horizons and it builds on existing elements of the GI in Dún Laoghaire-Rathdown. It distinguishes between the Green Network that is already in place in Dún Laoghaire-Rathdown, and that which is emerging or to be developed over the coming years.

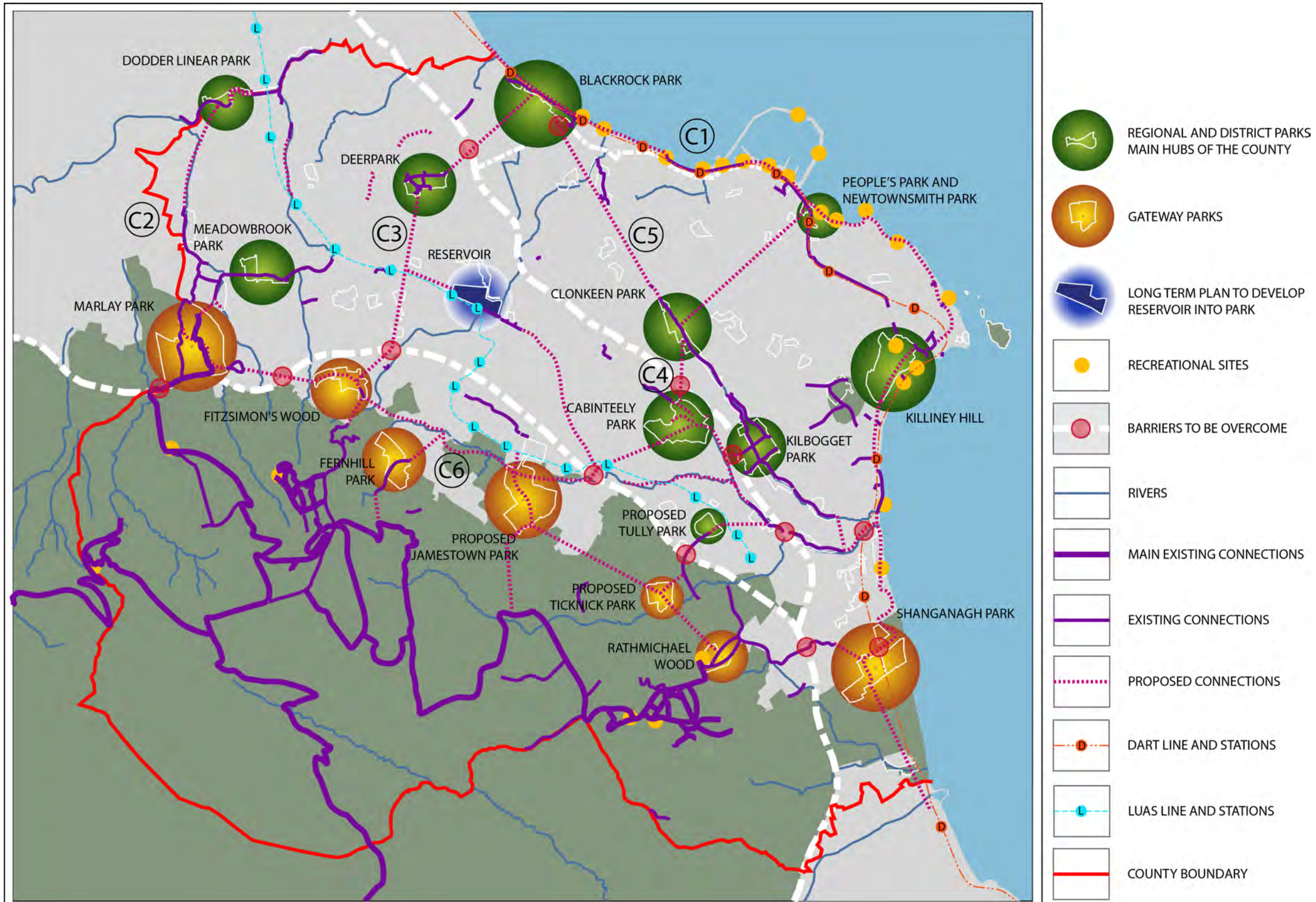
The **key features of a spatial framework** for Green Infrastructure in Dún Laoghaire-Rathdown are:

- A higher level, **County-wide network** of integrated elements, which connects to surrounding and **Regional GI networks**
- A structure for integrating the **rich network** of local-level GI in Dún Laoghaire-Rathdown
- A network of overlapping and **multi-functional GI corridors,** connecting higher-level GI hubs and the main elements of the mountains, the urban area and the coast
- Integration of important **regional GI corridors,** such as the East Coast Trail route, and the Dublin and Wicklow Mountain Ways and
- A **'chain'** of improved **'gateway hubs'** (major parks and gardens), which provide the transition between the mountains and the urban area





Map 15: Basic Spatial Framework Strategy.



Map 16: Detailed Spatial Framework Strategy.





Photo 48: Coastal Landscape with Trans-Boundary Views to County Wicklow.
Source: Flickr. Image By: William Murphy.

3.3 The Green Infrastructure Corridors for Dún Laoghaire-Rathdown

Green Infrastructure corridors are **the principal, higher-level or County-wide components** of the spatial framework for GI in Dún Laoghaire-Rathdown. The spatial framework includes a network of six such corridors. These corridors overlap, providing a single fully connected higher-level network or grid for GI. The main characteristics of the corridors are:

- Multi-functionality to varying degrees, including all or some of the main elements of the GI
- Continuity along the entire length of the corridor to allow the network to function properly and as a complete system
- Connection of the main assets and hubs of GI in the County and to surrounding and Regional GI corridors and hubs
- Protecting and improving integrity by ensuring that a balance is achieved between needs and sensitivities (for example, achieving improved access while protecting natural heritage)
- Accessibility to local communities and users, and to local or strategic public transport

Each corridor is described separately, along with the GI benefits that can be realised. **The corridors are:**

Corridor 1 - Coastal

Shanganagh Park – Killiney Hill – Newtownsmith Park – People’s Park – Blackrock Park



Photo 49: Coastline at Corbawn Lane.

Corridor 3: Blackrock to the Mountains

Blackrock Park – Deerpark – FitzSimon’s Wood – Fernhill Park – rural



Photo 51: Island in Blackrock Park.

Corridor 5: Intra Urban

Killiney Strand – Kilbogget Park/ Cabinteely Park/ Clonkeen Park – Deansgrange – Blackrock Park



Photo 53: Deansgrange Stream running through Kilbogget Park.

Corridor 2: River Dodder to the Mountains

River Dodder – Marlay Park – rural hinterland (Stepaside, Kiltarnan, Ballycorus)



Photo 50: Sleeping Fields Art Project, Marlay Walled Garden, Marlay Park.

Corridor 4: Dún Laoghaire to the Mountains

Newtownsmith Park – People’s Park – Clonkeen Park – Cabinteely Park – proposed Jamestown Park – rural/urban fringe (Carrickmines, Stepside, Kiltarnan)



Photo 52: 'Mothership' Sea Urchin Sculpture by Rachel Joynt. Located in Newtownsmith Park.

Corridor 6: Gateway Parks

Marlay Park – FitzSimon’s Wood – Fernhill Park – proposed Jamestown Park – proposed Ticknick Park – Rathmichael Wood – Shanaganagh Park.



Photo 54: Woodland Paths in Marlay Park.