

### 3.3.1 Corridor 1 - Coastal

#### *Shanganagh Park – Killiney Hill – Newtownsmith Park – People's Park – Blackrock Park*

Shanganagh Park is proposed as a Gateway Park as it is situated in a key location for commencing the coastal route. Blackrock Park is a regional park, which is also in a key location for introducing the coastal route and connecting with the intra urban and rural corridors. This corridor extends into surrounding counties; Dublin City to the north and Wicklow County Council to the south.

From a Green Infrastructure perspective the principal role of this corridor is to connect open space and recreational assets. It also links into a large number of local parks and Greenways and cycle routes. It has four major hubs, which provide connections with other GI corridors, at Shanganagh Park, Killiney Hill, Newtownsmith Park and Blackrock Park. The terrain and its urban nature has resulted in a corridor which utilises low traffic cycle routes, and as such has limited scope for habitat creation and continuous green corridors. The use of Green Street concepts would improve the green attributes of this route in a distinctively urban environment. They would also assist in the reduction of surface water flooding along this coastal route. The majority of the elements for this route are in place and the S2S promenade and cycleway and the East Coast Trail route, have the potential to become a key piece of the jigsaw.

#### Objectives

1. To provide a coastal corridor that connects a number of regional parks and iconic recreational sites within the County and extends into the surrounding administrative boundaries.
2. To improve visitor experience and increase duration of stay by providing a wide range of transport options and linkages to a choice of parks.
3. To provide a multi-functional GI corridor crossing and connecting the mountain, urban area and coast and linking with other corridors.

Map 17: Corridor 1. Coastal.

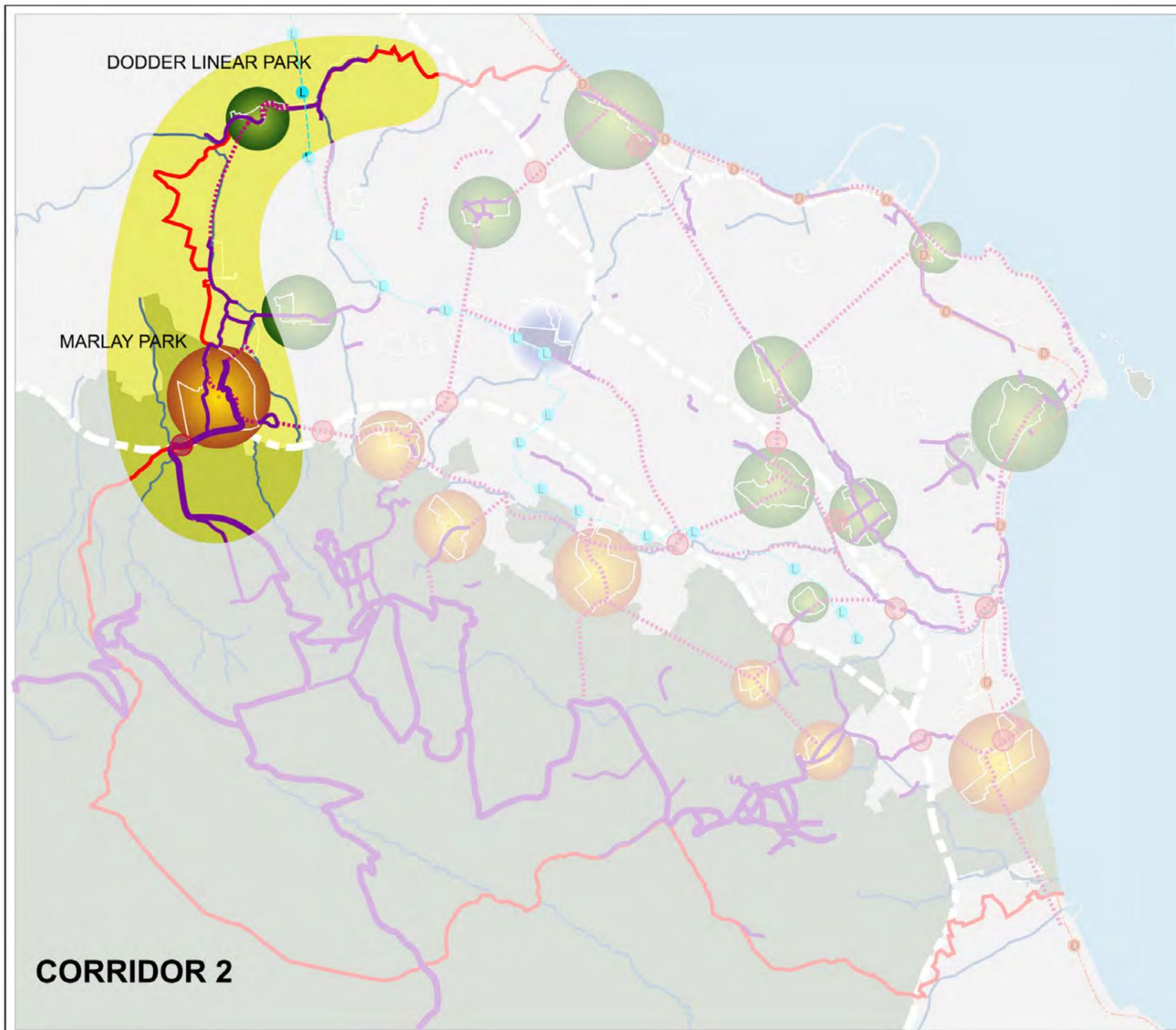
## Corridor 1 - Coastal: Actions

The following key actions are identified:

1. Enhance connections from the Greenway across the railway to Killiney Strand.
2. Create a Greenway connection from the coast to the Greenway connecting to Kilbogget Park as part of the intra-urban GI corridor aligning with Shanagh River and Deansgrange stream.
3. Provide opportunities for the interpretation of natural and cultural heritage, including geology, archaeology, ecclesiastical, industrial and transport heritage and literary heritage in the Killiney/ Dalkey/ Sandycove areas, connecting with Dalkey Islands.
4. Enhance the visual art and monuments of the Newtownsmith Park, People's Park and Dún Laoghaire Piers to enhance the sense of place.
5. Create a Green Street link from the People's Park connecting via local open spaces at Clarinda Park, Crosthwaite Park and Royal Terrace to the proposed Greenway to Clonkeen Park.
6. Connect the fragmented ecological corridor along the coast in the area of Dún Laoghaire Harbour.
7. Create better pedestrian and cycle links along Dún Laoghaire Harbour, particularly at the West Pier.
8. Create better pedestrian and cycle links across the DART line to the coast, particularly at the West Pier, Seapoint and Blackrock.
9. Create better access, and identify opportunities for an ecological corridor connection and water management in the area of the R113/N31 road junction at Temple Hill, Temple Park Avenue and Newtown Avenue.
10. Enhance interpretation of natural and cultural heritage at Booterstown Marsh.
11. Improve pedestrian and cycle links between Booterstown Marsh and Dublin City.

Multifunctional Benefits	Examples of Benefits
<b>Recreation and Health</b>	<ul style="list-style-type: none"> <li>A number of Regional Parks and recreational sites are located along this corridor which provide a good range of opportunities to improve physical and mental health.</li> <li>Improved access to Killiney beach increases recreational opportunities for all abilities.</li> </ul>
<b>Biodiversity and Natural Resources</b>	<ul style="list-style-type: none"> <li>Opportunity to enhance interpretation at Booterstown Marsh.</li> <li>Connects the fragmented ecological corridor along the coast at Dún Laoghaire Harbour.</li> <li>Identify opportunities for an ecological corridor connection at Temple Hill, Temple Park Avenue and Newton Avenue.</li> </ul>
<b>Coast, Water Resource and Flood Management</b>	<ul style="list-style-type: none"> <li>Create a 'Green Street' link from the People's Park via local parks to the proposed Clonkeen Road via Glenageary to Dún Laoghaire Greenway.</li> <li>Identify opportunities for water management at Temple Hill, Temple Park Avenue and Newton Avenue junction.</li> </ul>
<b>Sense of Place</b>	<ul style="list-style-type: none"> <li>Utilise sculpture and monuments to enhance a sense of place at People's Park, Newtownsmith Park and Dún Laoghaire Piers.</li> <li>Opportunities to utilise natural and cultural heritage in the Killiney/Dalkey/Sandycove areas.</li> </ul>
<b>Climate Change Adaptation and Mitigation</b>	<ul style="list-style-type: none"> <li>'Green Street' Link from the People's Park via local parks to the proposed Clonkeen Road via Glenageary to Dún Laoghaire Greenway can become part of a SuDS network.</li> <li>Tree cover in parks, open spaces, along streets and also in private ownership particularly in Killiney and Dalkey will absorb many atmospheric pollutants, filter out those pollutants, reduce water run-off, improve water quality, reduce noise and provide shading to help reduce urban heat island effects.</li> </ul>
<b>Economic Development</b>	<ul style="list-style-type: none"> <li>Opportunities to develop recreational tourism utilising the recreational sites along the coast.</li> </ul>
<b>Social Inclusion</b>	<ul style="list-style-type: none"> <li>Shanganagh Park, People's Park, Newtownsmith Park, Blackrock Park, Dún Laoghaire Piers and numerous coastal recreation sites along the coast provides a setting for community interaction and informal education in addition to developing community ownership of the environment.</li> </ul>
<b>Productive Environments</b>	<ul style="list-style-type: none"> <li>The coast and harbours provides a diverse range of productive environments including fisheries and tourism.</li> </ul>

Table 3.A: Benefits of Corridor 1 - Coastal.



### 3.3.2 Corridor 2 – River Dodder to the Mountains

#### *River Dodder – Marlay Park – rural hinterland (Stepaside, Kilternan, Ballycorus)*

The Dodder Valley Linear Park connects from the Dublin City Council area into Dún Laoghaire-Rathdown. Marlay Park is a regional park that is a key gateway park for access to and from the mountains. This corridor is partially established with the Dodder Valley Linear Park, and cycle networks and Greenways. This corridor also has Greenway links to Dundrum town centre. This corridor has the potential to be enhanced to provide multi-functional benefits, and provide a complete Green Infrastructure corridor.

#### Objectives

1. To provide a multi-functional GI corridor connecting the mountains, urban area and coast.
2. To link the County's flagship green space at Marlay Park with adjacent urban areas and strategic sustainable transport nodes.
3. Enhance the habitats alongside the river corridors as a part of an integrated GI corridor, and seek opportunities for attenuation of flood waters.

Map 18: Corridor 2. River Dodder to the Mountains.

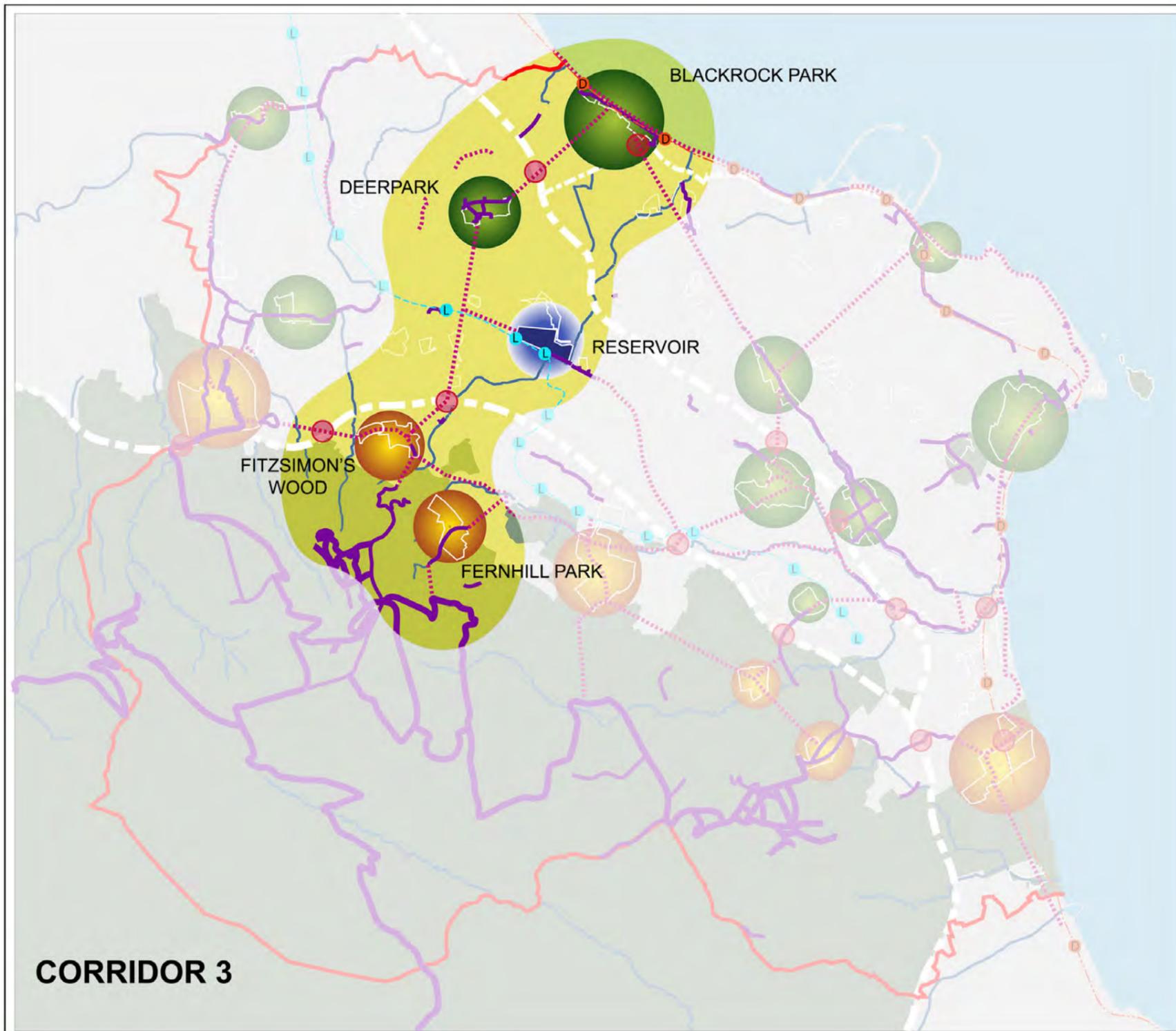
### Corridor 2 – River Dodder to the Mountains: Actions

The following key actions identified are:

1. **Extend the River Dodder restoration upstream on the Little Dargle and protect and enhance the status of the protected areas that the Dodder flows in to.**
2. **Identify opportunities to open the long culvert under the Grange Golf Course, which is on private land, to extend a continuous length of open river corridor for ecology and geomorphology of the Dodder. Manage risk of vegetation and debris and also risk of nutrient build up through golf course, especially fertiliser use.**
3. **Take opportunities to open the downstream culverted section at Loreto Park. Enhance the river form to encourage biodiversity and reinforce the ecological corridor.**
4. **Form links from sub-urban areas by implementing Green Streets and street tree planting.**
5. **Develop a network of wetlands at Marlay Park to create flood storage opportunities. Use river enhancement to attract target species for the ecological corridor.**
6. **Improve connections across the M50 from Marlay Park for pedestrians, cyclists and biodiversity.**

Multifunctional Benefits	Examples of Benefits
<b>Recreation and Health</b>	<ul style="list-style-type: none"> <li>• Marlay Park already functions very successfully as a Regional Park, providing opportunities for both active and passive recreation. Enhanced utilisation expected, and alternative recreational destinations can be accessed from the GI corridors.</li> <li>• Restorative benefits of the Dodder Linear Park which utilises the River Dodder are enhanced through further connection and access.</li> </ul>
<b>Biodiversity and Natural Resources</b>	<ul style="list-style-type: none"> <li>• Opportunities to open long sections of culverted rivers to improve ecology and geomorphology of the Dodder.</li> <li>• Manage risk of vegetation and debris and also risk of nutrient build up through golf course, especially fertiliser use.</li> <li>• Enhance river corridors in Marlay Park to attract target species to enhance the ecological corridor.</li> <li>• Improve connections across the M50 for biodiversity.</li> </ul>
<b>Coast, Water Resource and Flood Management</b>	<ul style="list-style-type: none"> <li>• Create flood storage opportunities, develop wetlands and manage bankside vegetation to reduce flood risk.</li> </ul>
<b>Sense of Place</b>	<ul style="list-style-type: none"> <li>• Utilise natural features such as the Little Dargle River to develop a distinct character for the corridor.</li> <li>• Opportunities for interpretation of industrial heritage which is clustered along the Dodder Linear Park to enhance a sense of place and distinctive character.</li> </ul>
<b>Climate Change Adaptation and Mitigation</b>	<ul style="list-style-type: none"> <li>• Form links from sub-urban areas by implementing Green Street's and street tree planting.</li> <li>• Tree cover in parks, open spaces, along streets will absorb many atmospheric pollutants, filter out those pollutants, reduce water run-off, improve water quality, reduce noise and provide shading to help reduce urban heat island effects.</li> </ul>
<b>Economic Development</b>	<ul style="list-style-type: none"> <li>• Opportunities to develop recreational tourism utilising the recreational sites in the Dublin Mountains.</li> </ul>
<b>Social Inclusion</b>	<ul style="list-style-type: none"> <li>• Parks such as Marlay Park provides great opportunities for community engagement through recreation and informal education in addition to developing community ownership of the environment.</li> </ul>
<b>Productive Environments</b>	<ul style="list-style-type: none"> <li>• The Dublin Mountains provides a diverse range of productive environments including farming, forestry and tourism.</li> </ul>

Table 3.B: Benefits of Corridor 2 - River Dodder to the Mountains.



### 3.3.3 Corridor 3 - Blackrock to the Mountains

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

This corridor runs between the regional Blackrock Park and the Dublin Mountains. This provides residents or visitors with opportunities to connect from the urban area of the County to the coast or to the mountains.

#### Objectives

1. To provide a multifunctional GI corridor connecting the mountain, urban area and the coast.
2. Enhance the utilisation of FitzSimon’s Wood as a gateway into the mountains.
3. To develop Fernhill Gardens into a Gateway Park / Regional Park

Map 19: Corridor 3. Blackrock to the Mountains.

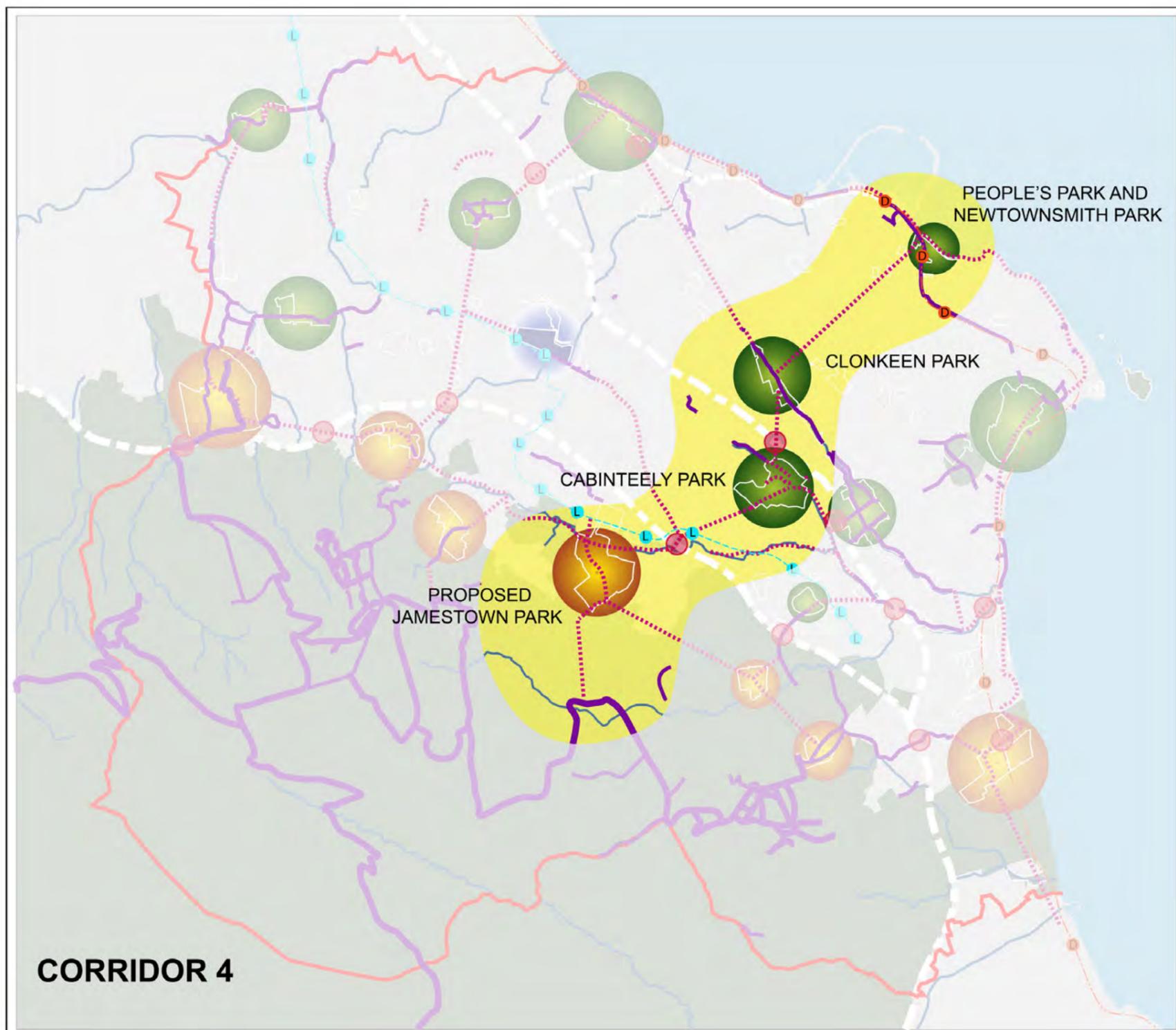
### Corridor 3 - Blackrock to the Mountains: Actions

The following key actions identified are:

1. **Improve pedestrian and cycle crossings, connect ecological corridors and identify opportunities for connecting the ecological corridor, enhanced biodiversity and water management at the junction with the R113/N31 road junction at Temple Hill, Temple Park Avenue and Newtown Avenue.**
2. **Utilise good transboundary views and natural and cultural heritage to enhance biodiversity, identity and the sense of place.**
3. **Create Green Infrastructure corridor linking to Sandyford Business District to enhance accessibility to open space in the area.**
4. **Use local parks, Greenways and Green Streets to link the Green Infrastructure corridor towards FitzSimon's Wood.**
5. **Enhance the crossing with Luas at Kilmacud, achieving better connectivity along the Green Infrastructure corridor.**
6. **Enhance the crossing at M50, achieving better connectivity along the Green Infrastructure corridor.**
7. **Upgrade FitzSimon's Wood, creating a gateway park to the mountains. Enhance and protect features of interest and reasons for designation of FitzSimon's Wood as a proposed natural heritage area. Create routes through the park to the rural area.**
8. **To develop Fernhill Gardens into a Gateway Park / Regional Park.**

Multifunctional Benefits	Examples of Benefits
<b>Recreation and Health</b>	<ul style="list-style-type: none"> <li>Improved utilisation and experience at connected key parks. Improvement in the quality and diversity of green space in Sandyford Business District will encourage office users to enjoy the health benefits from well designed and functional greenspace.</li> <li>Use of Greenways for commuting.</li> <li>Create routes through FitzSimon's Wood to the rural area while protecting features of interest and reasons for designation of FitzSimon's Wood as a proposed Natural Heritage Area.</li> <li>Development of Fernhill Gardens into a Gateway Park / Regional Park will provide a variety of amenities for the County while also providing opportunities for residents or visitors to connect from the urban area of the County with the mountains.</li> </ul>
<b>Biodiversity and Natural Resources</b>	<ul style="list-style-type: none"> <li>Connection of ecological corridors along Greenways.</li> <li>Enhancing and protecting features of interest and reasons for designation of FitzSimon's Wood as a proposed Natural Heritage Area.</li> </ul>
<b>Coast, Water Resource and Flood Management</b>	<ul style="list-style-type: none"> <li>Local opportunities for flood management and provision of SuDs within parks or within Greenways.</li> </ul>
<b>Sense of Place</b>	<ul style="list-style-type: none"> <li>Draw upon the reasons for designation of FitzSimon's Wood as a proposed Natural Heritage Area to retain a distinctive character.</li> <li>Enhanced the sense of place using good trans-boundary views from Deerpark.</li> </ul>
<b>Climate Change Adaptation and Mitigation</b>	<ul style="list-style-type: none"> <li>FitzSimon's Wood is important for climate amelioration and maintaining a healthy environment. Planting in urban areas within or adjacent to Greenways will provide climate cooling and reduce runoff.</li> </ul>
<b>Economic Development</b>	<ul style="list-style-type: none"> <li>Opportunities to develop recreational tourism utilising the recreational sites in the Dublin Mountains.</li> </ul>
<b>Social Inclusion</b>	<ul style="list-style-type: none"> <li>Parks such as Blackrock Park and Deerpark provide great opportunities for community engagement through recreation and informal education in addition to developing community ownership of the environment.</li> </ul>
<b>Productive Environments</b>	<ul style="list-style-type: none"> <li>The Dublin Mountains provides a diverse range of productive environments including farming, forestry and tourism.</li> </ul>

Table 3.C: Benefits of Corridor 3 - Blackrock to the Mountains.



### 3.3.4 Corridor 4 - Dún Laoghaire to the Mountains

***Newtownsmith Park – People’s Park – Clonkeen Park – Cabinteely Park – Proposed Jamestown Park – rural/urban fringe (Carrickmines, Stepside, Kilternan)***

Newtownsmith Park and the People’s Park are key open space locations for connecting with the coastal and urban to rural Green Infrastructure corridors. Clonkeen Park (a district park) and Cabinteely Park (a regional park) act as hubs along the intra-urban Green Infrastructure corridor. The proposed Jamestown Park should be developed to act as a gateway park to the mountains. Some of the corridor length has been developed using cycle routes and Greenways. The connection between Clonkeen Park and People’s Park is subject to proposals to enhance the links into the green space in the Honeypark residential development, including access through the National Rehabilitation Hospital on Rochestown Avenue. Critical Greenway links are needed to complete this corridor.

#### Objectives

1. To provide a multi-functional GI corridor connecting the mountain, urban area and coast.
2. To develop the proposed Jamestown Park as a Gateway Park to the mountains.

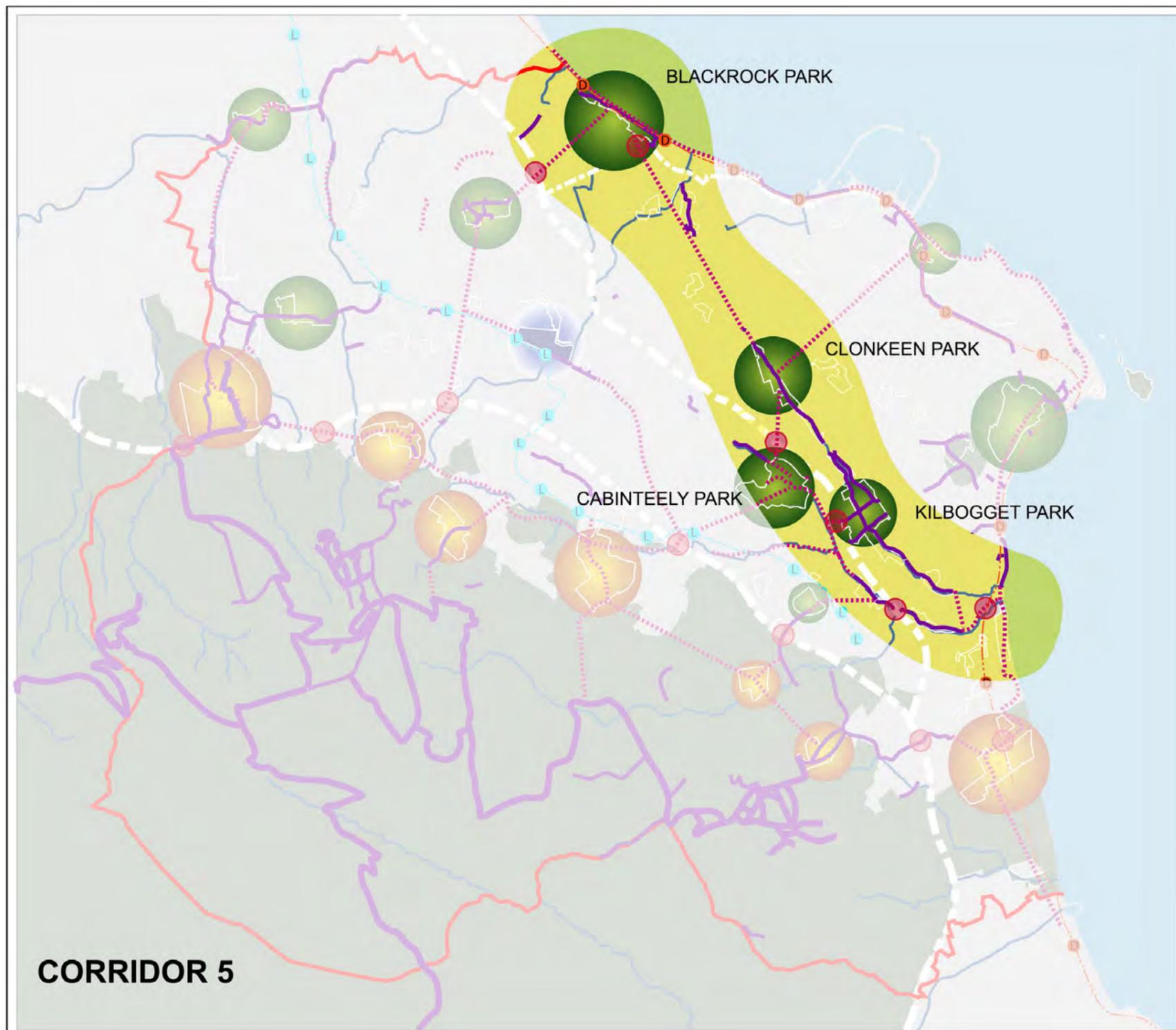
Map 20: Corridor 4. Dún Laoghaire to the Mountains.

**Corridor 4 - Dún Laoghaire to the Mountains: Actions**  
The following key actions identified are:

1. Use Green Streets to connect local open spaces at Clarinda Park, Crosthwaite Park and Royal Terrace and to connect further into the Green Infrastructure corridor.
2. Enhance the crossing at the N11 between Clonkeen and Cabinteely Parks. Assess whether a full green multi-functional corridor can be achieved at this crossing.
3. Enhance connections with the Carrickmines Luas stop and across the Luas and M50.
4. Promote and develop the proposed Jamestown Park as a gateway into the mountains.
5. Identify and enhance Cabinteely Park in order to provide flood attenuation potential alongside the Foxrock Stream.

Multifunctional Benefits	Examples of Benefits
<b>Recreation and Health</b>	<ul style="list-style-type: none"> <li>Enhanced connections between parks and between Luas stops will deliver recreational and health benefits from these Greenways. Improvements in access to existing parks via Greenways will increase use.</li> <li>Development of the proposed Jamestown Park will offer significant passive and active recreational opportunities for the new neighbourhoods being developed close by.</li> <li>This corridor provides residents or visitors with opportunities to connect from the urban area of the County with the coast or with the mountains.</li> </ul>
<b>Biodiversity and Natural Resources</b>	<ul style="list-style-type: none"> <li>Maximise the potential of biodiversity along the Deansgrange Stream by enhancing the river form following the recent flood relief scheme which has naturalised the river form in Clonkeen Park.</li> </ul>
<b>Coast, Water Resource and Flood Management</b>	<ul style="list-style-type: none"> <li>Use of Green Streets to connect further into the Green Infrastructure corridor in the denser urban areas will reduce runoff.</li> <li>Improve existing river enhancements and flood protection at Clonkeen Park. Identify opportunities for wetlands for flood attenuation (if necessary) and to filter and trap urban pollutants and sediment.</li> </ul>
<b>Sense of Place</b>	<ul style="list-style-type: none"> <li>Utilise sculpture, natural and cultural heritage to enhance a sense of place at People's Park, Newtownsmith Park, Dún Laoghaire Piers and Cabinteely Park.</li> </ul>
<b>Climate Change Adaptation and Mitigation</b>	<ul style="list-style-type: none"> <li>Trees in parks and open spaces are 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.</li> </ul>
<b>Economic Development</b>	<ul style="list-style-type: none"> <li>Opportunities to develop recreational tourism utilising the recreational sites in the Dublin Mountains and coastal recreation sites.</li> </ul>
<b>Social Inclusion</b>	<ul style="list-style-type: none"> <li>Existing and proposed parks provide great opportunities for community engagement through recreation and informal education in addition to developing community ownership of the environment.</li> </ul>
<b>Productive Environments</b>	<ul style="list-style-type: none"> <li>The Dublin Mountains provides a diverse range of productive environments including farming, forestry and tourism.</li> </ul>

**Table 3.D: Benefits of Corridor 4 - Dún Laoghaire to the Mountains.**



Map 21: Corridor 5. Inter Urban.

### 3.3.5 Corridor 5 - Intra Urban

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

The location of the Shanganagh and Deansgrange rivers at Killiney Strand are the starting point for the intra urban Green Infrastructure connection. It also connects with the coastal corridor. Blackrock Park is a regional park, which acts as a key location for introducing the urban to rural corridor and connecting with the intra urban and coastal corridors.

This is a corridor rooted in its local community, but extends access to the coast. Significant recreational activity is centred at Kilbogget Park, and further extension and use of connecting green space will be encouraged with the GI Corridor status. This GI corridor would utilise the existing green and open spaces to develop their full multifunctional potential. An established Greenway runs along most of the corridor, with the Deansgrange River providing a continuity and diversity that can be enhanced by the application of GI techniques. River restoration and opening up of the river would be prime of example of the GI potential.

#### Objectives

1. To provide a multi-functional GI corridor connecting the urban area and coast, with links to the mountains via other Corridors and cycle network.
2. Enhancing the urban linear parks adjacent to watercourses with fully integrated wildlife and habitat features.
3. Reduce flood risk in the downstream reaches of Deansgrange River through attenuation within parks, use of SuDs within the Greenways and Green Streets on local roads leading into the park areas.

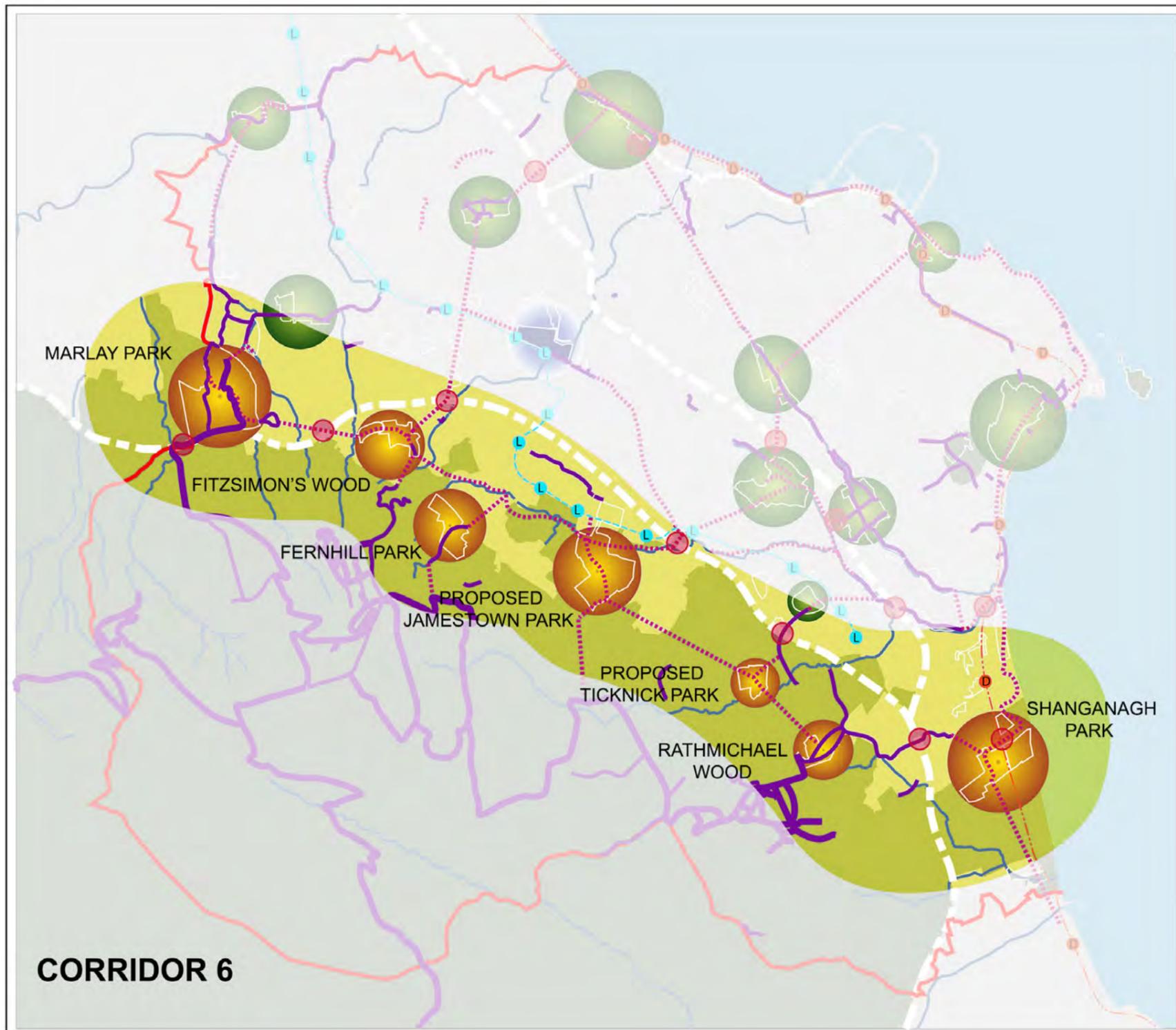
### Corridor 5 - Intra Urban: Actions

The following key actions identified are:

1. **Improve corridor links across the Railway line to Killiney Strand.**
2. **Maximise potential of smaller parks downstream of Kilbogget Park for water management and biodiversity. Further de-culverting through the lower areas of the park should be considered as opportunities arise.**
3. **Maximise flood storage potential in Kilbogget Park and mitigate the unavoidable barrier of the river culvert under sports pitches through old landfill, by further ecological enhancement upstream and downstream.**
4. **Improve connections and wayfinding between Kilbogget and Clonkeen Parks.**
5. **Improve existing river enhancements and flood protection at Clonkeen Park. Identify opportunities for wetlands for flood attenuation (if necessary) and to filter and trap urban pollutants and sediment.**
6. **Connect Clonkeen Park with Deansgrange Cemetery through the use of Green Streets and disconnect surface water runoff from the drainage network.**
7. **Enhance biodiversity in Deansgrange Cemetery by using landscape management techniques.**
8. **Strengthen the identity and sense of place by using elements of cultural heritage, possibly associated with the Deansgrange and Quaker cemeteries.**

Multifunctional Benefits	Examples of Benefits
<b>Recreation and Health</b>	<ul style="list-style-type: none"> <li>This proposed corridor intersects with a number of other Green Infrastructure corridors creating a network across the County which will encourage greater potential use of the GI for recreation.</li> <li>Local access and views of a mix of green landscapes will be encouraged by having a GI corridor, and will bring health benefits.</li> </ul>
<b>Biodiversity and Natural Resources</b>	<ul style="list-style-type: none"> <li>The ecological corridor along Deansgrange Stream and Shanganagh River can be improved, with wildflower mixes and less intervention.</li> <li>Smaller parks downstream of Kilbogget Park can be managed for biodiversity outcomes.</li> </ul>
<b>Coast, Water Resource and Flood Management</b>	<ul style="list-style-type: none"> <li>GI along this corridor can be used to maximise flood storage potential in Kilbogget Park.</li> <li>Connect Clonkeen Park with Deansgrange Cemetery through the use of Green Streets and disconnect surface water runoff from the drainage network, thereby reducing runoff into the catchment.</li> </ul>
<b>Sense of Place</b>	<ul style="list-style-type: none"> <li>Improvements to the identity and sense of place by using elements of cultural heritage, possibly associated with the Deansgrange and Quaker cemeteries.</li> </ul>
<b>Climate Change Adaptation and Mitigation</b>	<ul style="list-style-type: none"> <li>Trees in parks and open spaces are important for climate amelioration and maintaining a healthy environment.</li> </ul>
<b>Economic Development</b>	<ul style="list-style-type: none"> <li>Opportunities to develop recreational tourism utilising the corridors access to the coastal recreation sites.</li> </ul>
<b>Social Inclusion</b>	<ul style="list-style-type: none"> <li>The range of parks in this corridor provide great opportunities for community engagement through recreation and informal education in addition to developing community ownership of the environment.</li> </ul>
<b>Productive Environments</b>	<ul style="list-style-type: none"> <li>The coast provides a diverse range of productive environments including fisheries and tourism.</li> <li>Potential in the under-utilised sections of open space to create allotments and community gardens.</li> </ul>

Table 3.E: Benefits of Corridor 5 - Intra Urban.



### 3.3.6 Corridor 6 - Gateway Parks

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

These enhanced parks and links act as a transition between the rural and urban landscapes. They are made of 7 parks or transitional open spaces. This is an ambitious but exciting Green Infrastructure corridor. Significant enhancement and development of existing and proposed parks are a feature of this corridor. Similarly Greenways identified in the Cycle Network Plan will need to be brought forward in order to complete the corridor and link these transitional parks.

The transitional or Gateway Parks are to provide access points to and from the mountains and open space above the urban area of the County. Linkages to other main GI corridors also ensure that sustainable travel options are available for those who want to venture beyond the ‘park’ environment not only from within the County, but from a wider regional catchment. These gateway parks will have formal and informal spaces, less managed but habitat rich areas and then access onto the mountains for those who are prepared for a longer recreational activity.

#### Objectives

1. To provide transitional gateways to the mountains and open spaces from the urban areas of the County.
2. Ensure that sustainable travel options are supported by the wider GI network.
3. To connect a chain of existing and proposed parks and open spaces along the urban fringe, providing variety of recreational and visitor experiences.
4. Ensure the cultural heritage assets are incorporated in the GI assets associated with these gateway parks.
5. To develop Fernhill Gardens into a Gateway Park / Regional Park.

Map 22: Corridor 6. Gateway Parks.

### Corridor 6 - Gateway Parks: Actions

The following key actions identified are:

1. **Improve corridor links across the M50, which should attempt to link habitat and water functions. It is accepted that some breaks in habitat connectivity is likely for such large infrastructure crossings.**
2. **Reduce sediment and river flows downstream, filter agricultural and road runoff and create wetland habitats by using the opportunity for attenuation and wetlands where the Little Dargle and Slang cross the proposed Greenway or flow through the hub or park.**
3. **Enhance and protect features of interest and reasons for designation of FitzSimon's Wood as a proposed Natural Heritage Area.**
4. **Create way marked but less formal routes through FitzSimon's Wood to the rural area.**
5. **To develop Fernhill Gardens into a Gateway Park / Regional Park.**
6. **Enhance river restoration and the protection of natural watercourse by creating buffer strips along the Carrickmines River.**
7. **Enhance water management and biodiversity through the aims of the proposed Ticknick Park.**
8. **Create a new hub that could be designed as a key part of the ecology network to suit target species at the proposed Ticknick Park.**
9. **Protect and enhance status and quality of nearby Dingle Glen proposed NHA.**
10. **Create wetland for water storage and filtering runoff to benefit downstream on the Kinkeen Stream and enhance biodiversity at Rathmichael Wood.**
11. **Enhance the ecological corridor from Rathmichael Wood to Shanganagh Park.**
12. **Improve connections to cross M11 to Shanganagh Park and across railway line to Killiney Strand at Quinn's Road.**

Multifunctional Benefits	Examples of Benefits
<b>Recreation and Health</b>	<ul style="list-style-type: none"> <li>Significant new recreational benefit is leveraged with this corridor. A corridor along the urban rural fringe will encourage participation in cycling and walking to and from Marlay Park or FitzSimon's Wood from a wider catchment with numerous crossing points of the M50.</li> <li>Longer distance walking into the rural open space will be encouraged and facilities provided to support that.</li> <li>Development of Fernhill Gardens into a Gateway Park / Regional Park will provide a variety of amenities for the County while also providing opportunities for residents or visitors to connect from the urban area of the County with the mountains.</li> </ul>
<b>Biodiversity and Natural Resources</b>	<ul style="list-style-type: none"> <li>Enhance river restoration and the protection of natural watercourse. Enhance biodiversity at the proposed Ticknick Park.</li> <li>Further enhancement of the habitat at FitzSimon's Wood.</li> </ul>
<b>Coast, Water Resource and Flood Management</b>	<ul style="list-style-type: none"> <li>Attenuation and wetlands where the Little Dargle and Slang cross the proposed Greenway.</li> <li>Enhanced water management at Ticknick Park.</li> <li>Creation of wetland for water storage and filtering runoff at Rathmichael Wood.</li> </ul>
<b>Sense of Place</b>	<ul style="list-style-type: none"> <li>Strengthen the distinctive character of FitzSimon's Wood by enhancing and protecting features of interest and reasons for designation of FitzSimon's Wood as a proposed natural heritage area.</li> </ul>
<b>Climate Change Adaptation and Mitigation</b>	<ul style="list-style-type: none"> <li>Woodlands are important for climate amelioration and maintaining a healthy environment.</li> </ul>
<b>Economic Development</b>	<ul style="list-style-type: none"> <li>Opportunities to develop recreational tourism utilising the Dublin Mountain recreation sites.</li> </ul>
<b>Social Inclusion</b>	<ul style="list-style-type: none"> <li>Parks provide great opportunities for community engagement through recreation and informal education in addition to developing community ownership of the environment.</li> </ul>
<b>Productive Environments</b>	<ul style="list-style-type: none"> <li>The Dublin Mountains and upland provides a diverse range of productive environments including farming, forestry and tourism.</li> </ul>

Table 3.F: Benefits of Corridor 6 - Gateway Parks.

## 3.4 Case Studies

### 3.4.1 Kilbogget Park

#### Maximising the benefits of existing Public Parks by enhancing multi-functional spaces

This large, sub-urban park - reclaimed from a former landfill - is significant as it evokes the spirit and substance of the European Landscape Convention (ELC). The Convention's preamble specifically includes "ordinary" and "everyday" landscapes within the scope of the Convention; and Kilbogget may be considered as ordinary/everyday in terms of its social function, facilities and ethos. Indeed, Kilbogget Park is also a practical example of landscape 'connectedness', because of its strong visual links westwards, across the N11 barrier, to the county's upland rural landscapes. Some of these are designated as high amenity in the Dlr CDP 2010-2016. So, this is an interesting Dlr example of the inter-visibility of two landscape types - "ordinary", man-made designed landscape and cultural, rural landscape.

**The ELC states that "- the landscape is important as a component of the environment and of people's surroundings in both town and country, whether the landscape in question is ordinary or of outstanding beauty."**

Kilbogget Park is located in Dun Laoghaire and follows the Deansgrange River and the Kilbogget Park off road cycle route. This park provides multiple functions with many benefits to those living locally and using the recreational facilities. The park demonstrates how existing parks and open spaces can be enhanced to provide the wider Green Infrastructure benefits.



Photo 55: Kilbogget Park to the Dublin Mountains.



Photo 56: Kilbogget Park, Constructed Attenuation Wetlands Habitat.

The western section of the Deansgrange River flowing through Kilbogget Park has been restored to create a more natural wetland environment with riparian habitats. The Kilbogget Park Wetland has a surface area of 66,000 m<sup>2</sup> with one of its functions being a sustainable drainage (SuDs) feature. Downstream of the wetlands to the east of Kilbogget Park the river flows in culvert under reclaimed landfill, now used as sports pitches. The contaminated land is a constraint to fully naturalising the river.

The wetlands and park provide many elements of multifunctional Green Infrastructure with benefits including:

- Improved biodiversity through in-channel, riparian, grassland and woodland habitat creation
- Improved health and well-being through the provision of off road cycle and walking routes
- Improved air quality in terms of noise reduction and filtering of air pollution

- Improved water quality through better oxygenation of water and filtration of sediment and pollution from runoff
- Reduced downstream flood risk through attenuation of flood flows and reduction in the rate of runoff entering rivers. The wetlands have the potential to store up to 40,000m<sup>3</sup> of flood water
- Reduced downstream maintenance of structures as sediment and silt is trapped upstream of bridges and culverts

There are opportunities to further enhance the Green Infrastructure features of the park such as optimising the flood storage capacity, naturalising some of the canalised sections and improving the links to the park and the existing Greenway. This would deliver the measures required by the EU Water Framework and Floods Directives, making the watercourse more resilient to extreme flood and water quality events.

## 3.4.2 FitzSimon's Wood

### Enhancement of natural habitats through community participation and volunteering

Located at the foot of the Dublin Mountains and the edge of the urban area in Sandyford, FitzSimon's Wood is a proposed Natural Heritage Area for its semi-natural woodland. The woodland is classified as a local park and improvements to the woodland habitat were carried out in 2008 by the Friends of FitzSimon's Wood voluntary group. Funding for the improvements came from a NeighbourWood grant in 2008 from the Department of Agriculture, Fisheries & Food (Forest Service). Through community involvement works included developing footpaths, planting native trees and management of invasive species.

FitzSimon's Wood provides the following green infrastructure functions:

- Habitat protection for key species
- Environmental education and nature trail
- Recreational access to open space

A key function the woodland plays is in the diversity of different types of parks and open spaces throughout Dún Laoghaire-Rathdown, offering spaces which attract people with different interests, but still retaining its accessibility. It is a good example of how local groups, supported by the Council can access grants that make incremental delivery of Green Infrastructure possible.



Figure 3.A: FitzSimon's Wood Nature Trail.



Photo 57: Holly Blue Butterfly: A speciality of FitzSimon's Wood, with two generations a year. Source: Cólín MacLochláinn.



Photo 58: FitzSimon's Wood.

### 3.4.3 Green Streets

#### Maximising the benefits of streets as multi-functional Green Infrastructure

Green Streets provide an alternative way of managing street drainage which provide multiple benefits associated with Green Infrastructure. Use of natural materials and planting delivers greener landscapes and attractive places. Traditionally road drains are directly connected to the surface water or combined sewer network and are designed for a specified capacity of runoff. When this capacity is exceeded flooding occurs. If combined foul and surface water sewers exceed their capacity untreated raw sewage can be discharged direct to watercourses or the sea with direct impacts upon the natural environment. In traditional road drainage systems there is usually no separation of sediments and pollutants from the water and these enter the sewer system. Green Streets contribute to improved water quality to meet River Basin Management Plan Objectives under the Water Framework Directive.

The objectives of Green Streets are to:

- Stop or delay runoff from entering sewer systems
- Filter pollutants and sediments
- Separate surface water runoff from combined sewer networks,
- Reduce the demand for wastewater treatment
- Manage and control flood water when sewer networks exceed capacity
- Provide urban cooling, shade and filter air pollutants and noise
- Provide street trees and planting as a barrier between pedestrians, cyclists and traffic
- Provide local biodiversity



Photo 59: Rain Garden in Malmö, Sweden

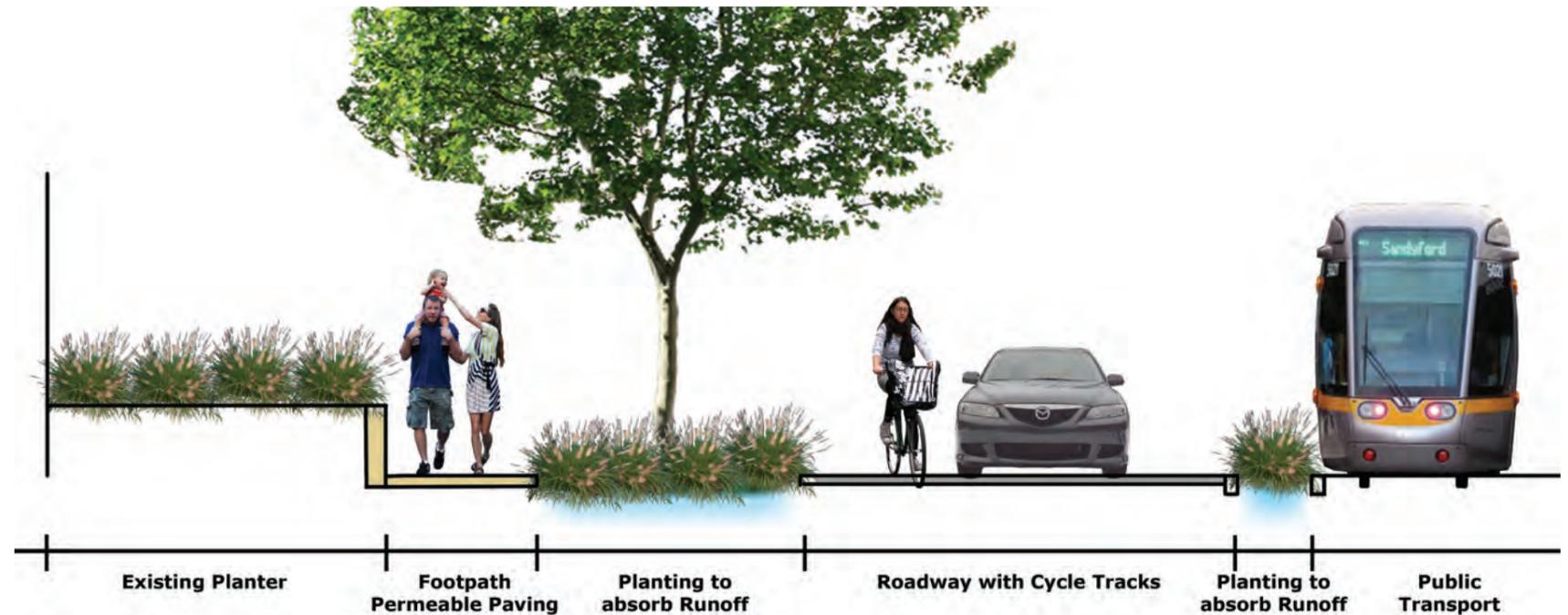


Figure 3.B: Typical Green Street Section

#### Example 1 Dwr Cymru – Rainscape project in Llanelli

Dwr Cymru (Welsh Water) are in the process of installing RainScape features in Llanelli to reduce the risk of sewer flooding as an alternative to expensive stormwater tanks. The RainScape project is the first project of its kind in the UK. The project will cost £15 million funded by Dwr Cymru as a non-shareholder utility company. RainScape features include: Basins and Planters, Swales, Porous Paving, Grass channels and underground storage. In the first year of operation the scheme has reduced flow rates by 77% for a 1 in 1 year rainfall storm with a peak rainfall intensity of 40mm/hr.

#### Example 2 Portland, Oregon – Green Streets

Portland began its stormwater program in the early 1990s in response to national stormwater discharge legislation in the USA. The initial actions of this plan included downspout disconnection from combined sewers as cost effective measures. In 2007 Portland City Council approved a policy to promote Green Streets in public and private development. The city council provides funding for stormwater management projects through grants and grant matching programmes. Grant funding is directed to addressing high flood risk areas, community development and education and providing multiple environmental benefits. The success of Green Streets in Portland has been attributed to the integration of Green Streets with other stormwater management policies, plans and projects.

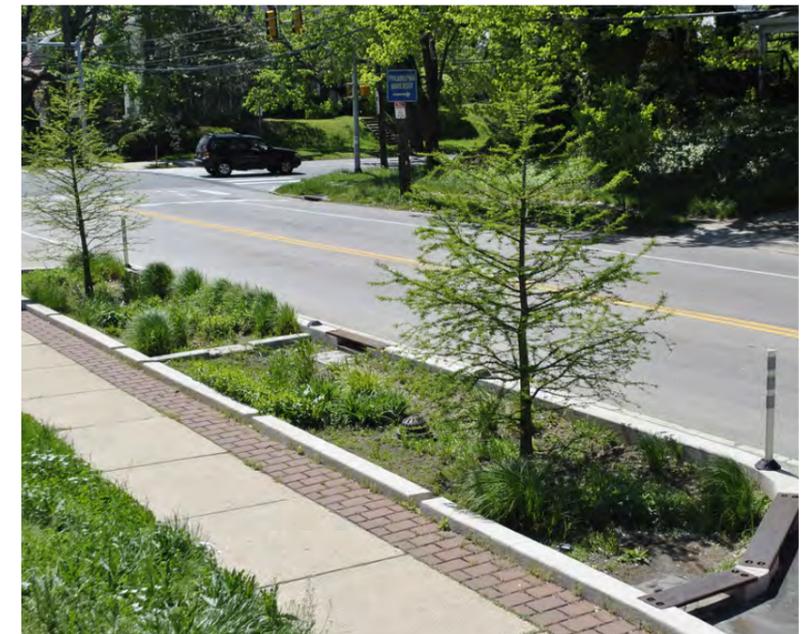


Photo 60: Stormwater Bump-Out on Queen Lane, Philadelphia. Source: Flickr. Image By: Philadelphia Water Department.

## 3.4.4 Honeypark, Glenageary

### Creating multi-functional Green Infrastructure using the Development Planning Process

Honeypark is a recent development in Dún Laoghaire on the site of the old Dún Laoghaire Golf Club. The public open spaces in Honeypark have been designed as multifunctional Green infrastructure. This example demonstrates how it is possible for GI to be incorporated into planning policy so development masterplans address the multifunctionality of open spaces to benefit the wider community. The Dún Laoghaire Rathdown Open Space Strategy sets the required quality standards for open spaces and the County Development Plan objectives ensure developers respond with high quality placemaking.

The wetland is the focal point of the open space and has been designed to provide flood storage, habitat, recreation and aesthetic functions. The wetland acts as an attenuation pond to control and store a runoff following storms. This regulates flow and reduce volumes flowing downstream in the sewer network and rivers reducing the risk of flooding. The wetland and marginal vegetation provides natural habitat in the urban areas. Specifically the pond is long enough for swans to land and take off and duck houses provide shelter. The marginal vegetation offers further natural shelter and filters sediment and pollutants from surface water runoff, both direct from paved areas and also from discharges from the estate surface water drains. The planting scheme extends throughout the development and provides shading, privacy and impermeable surfaces to reduce the rate and volume of runoff and filter urban pollutants and sediment.

The strategic location of the park in the development masterplan maximizes the recreation, relaxation and aesthetic functions with social and health benefits to the local community. The safe and varied play areas and quiet spaces ensure that the park is well used by a broad demographic. When the park is fully adopted by the local council it will be able to form part of the Strategic Green Infrastructure Corridor linking Clonkeen Park to Dún Laoghaire and providing benefits to the wider community.



Photo 61: Honeypark, Glenageary. Native Wildflower Meadow.



Photo 62: Honeypark, Glenageary. Attenuation Feature Lake.



Photo 63: Honeypark, Glenageary. Recreation Trails.



Photo 64: Honeypark, Glenageary. Street Design.





Photo 65: Killiney Beach and Killiney Hill Park.

# 4 Delivery of the Strategy

## 4.1 Introduction

The spatial framework for the Green Infrastructure strategy will be a key part of the draft County Development Plan 2016-2022. The GI corridors have the potential to provide a wide range of multi-functional benefits to the County. But the challenge will be to deliver these benefits through an adequate and dedicated funding stream. This will enable the spatial framework to be established.

The Green Infrastructure corridors and their hubs will be delivered through a variety of initiatives, over differing timescales and through a range of institutional bodies. In setting out the delivery plan, the most important issue is to describe the leadership and assign the resources that are critical to the success of the strategy. It will then follow that investment and funding can be targeted and bids made for internal and external funding. However, it is often small incremental steps and continuing with current initiatives that starts to build a robust GI framework. A series of actions have been identified which will increase the evidence base so as to make a more comprehensive case for funding and to leverage joint working arrangements.

It should not be underestimated how resource intensive the search for external funding can be, or working with other initiatives and institutions to secure a particular Green Infrastructure related action. At a time when council budgets are under pressure and resources stretched the Delivery Plan will need to remain realistic. However, the initial actions identified in this Chapter are focused on positioning Dún Laoghaire-Rathdown County Council in a place of influence within the Greater Dublin Area (GDA) and facilitating existing and potential GI partners to seek external funding.

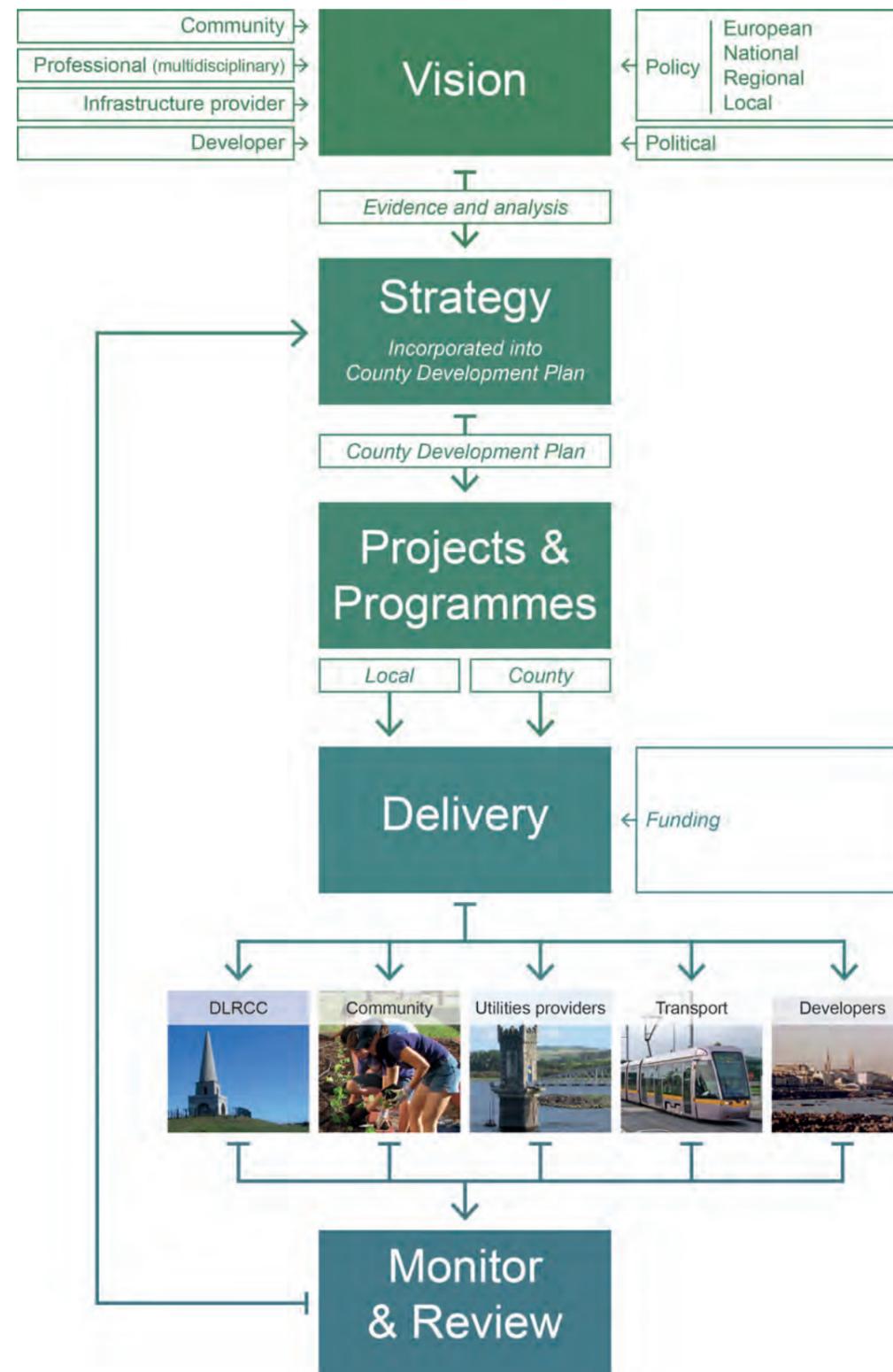


Figure 4.A: Delivery Diagram.

## 4.2 Leadership

Green Infrastructure is core to the wider Greater Dublin Area (GDA) competing on the world stage as a place to live, work and invest in. As a result GI is elevated to an overarching concept that influences all levels of economic planning, place making and community well-being. Dún Laoghaire-Rathdown County Council have set out a vision for GI in the County, and as a body will provide significant policy leadership and influence on the form of new development and management of many of the green assets. Delivery of its vision, within the principles set out in this document, will depend on the success of partnerships. These partnerships will support cross-boundary and local community led initiatives. From the analysis presented in Chapter 2, Dún Laoghaire-Rathdown has an excellent provision of green spaces, a geography that leads to a clear green network to be articulated and expanded. However, this will only happen if inter-disciplinary and cross-boundary working is achieved through all the appropriate financial and policy instruments to which the Council has access.

Demonstrating the value of Green Infrastructure and the variety of scales and types of interventions possible is crucial to achieving funding from the variety of sources available. Political and professional champions will be important in setting and promoting a vision whereby GI adds to the quality of a County and differentiates its offer by attracting investment. Professionals in planning and designing GI should understand the socio-economic context in which they work and that individual projects are linked to the wider vision and framework for the County.

Without a coherent organisational approach to Green Infrastructure, the strategy will be limited in its impact to the singular uses and specific benefits of its parks and open spaces. Therefore, it is recommended that a dedicated, Inter-departmental Working Group be formed as soon as possible, reporting directly to the Chief Executive. The Group should be comprised of competent and well-motivated staff from the following Council departments and disciplines:-

- Parks and Landscape Services (Landscape Architecture, Horticulture, Arboriculture, Ecology, Heritage, Sports and Recreation Management)
- Planning and Enterprise (Land Use/Spatial Planning, Economics Development)
- Transportation (Civil Engineering - Roads Maintenance, Planning, Traffic)
- Water & Drainage (Civil Engineering - Stormwater Management, Flood Management)
- Housing & Community (Community and Social Development)
- Local Enterprise Office (Business Promotion, Funding, Economics and Enterprise)

The immediate task for the Group would be to produce a Delivery Plan and that has the full commitment of each department, is practicable and integrated with departmental processes and projects.

The Delivery Plan must take account of local and regional groups and state bodies who could have a role in advocating, funding, providing, facilitating, managing or promoting GI.

Representatives of the following neighbouring local authorities were involved in the development of the strategy during a workshop in May 2014. The Delivery Plan should include for ongoing liaison and consultation with them.

- Dublin City Council
- South Dublin County Council
- Wicklow County Council

In addition, the Delivery Plan should provide for engagement with other important stakeholders. To that end, Dlr should issue invitations to the Dublin Mountains Partnership, the Institute of Public Health, HSE, Healthy Ireland Framework, environmental NGOs, local business and community groups and such other key stakeholders as it thinks appropriate.

The strategy has identified 6 corridors to form the core of the County level GI provision. These corridors consist of hubs and links, which in a number of corridors are drawn from the Greenways from the Open Space and Recreation sections of the draft County Development Plan 2016 - 2022. Therefore, the immediate focus is the formation of these Greenways, and the creation or enhancement of Gateway Parks on the peri-urban fringe of the County.

It is important that this immediate focus does not detract from the wider Green Infrastructure improvements that can be achieved through the Council's capital projects, operational programmes, and partnerships with community groups and Development Management process. Continued maintenance and enhancement of the extensive provision of open space must be continued. This will require increasing levels of capital and revenue funding in order to deliver the significant multi-functional benefits from these green spaces.

## 4.3 Policy Recommendations

As Green Infrastructure is cross-sectoral and multi-professional the outcomes are often greater than the inputs. To be fully effect these outcomes, Dlr should develop policies that are designed to engage prospective partners in embracing and promoting GI in their plans and activities. For example, promoting empowerment in healthy choices at a local level will assist government deliver their policy to increase levels of physical activity for all ages. GI is a powerful enabling tool in delivering this policy of the Healthy Ireland Framework, There is a potential synergy in linking health policy to the optimal use of use of parks, open spaces, sports facilities and greenways.

The Council's main ability to influence, promote and deliver Green Infrastructure is through the both Development Management and Forward Planning processes. In terms of the latter, the draft County

Development Plan (CPD) (2016-2022) has strong links to this Strategy, across a wide range of policies, contained in the following sections of the Plan:

- Sustainable Communities Strategy
- Green County Strategy
- Physical Infrastructure Strategy
- Community Strategy
- Specific Local Objectives

The following recommendations seek to protect and enhance existing GI assets while planning and promoting new assets, through the CDP 2016-2022 and other forward planning documents as they are prepared de novo or as reviews of current plans (e.g. Local Area Plans, SDZ's, framework plans etc.)

### 4.3.1 Policy Recommendations for Accessibility, Health and Well-Being

- To provide a suite of Greenways that is integral to the delivery of the Strategy and its Green Network that utilises existing routes and greenways based on consensus between landowners, ecologists, recreation providers and other relevant stakeholders.
- To use the County Development Plan and Local Area Plan process to improve the recreational opportunities by providing parks for active and passive recreation and for environmental learning.
- To improve linkages across infrastructure barriers and, where feasible, create full GI habitat and water corridors.

### 4.3.2 Policy Recommendations for Natural and Cultural Heritage

- To create a network of ecological corridors to enhance the biodiversity assets of the County.
- To identify and create opportunities to incorporate non-designated habitats into green infrastructure through linkages to designated and protected habitats/sites.
- To use GI to assist in the protection of the Natura 2000 network of sites.
- To undertake a study of where an ecologically appropriate treatment to flood risk management could be achieved through GI, where possible by de-culverting existing watercourses.
- To use GI to significantly improve public access to natural habitats and historic resources by the creation of pedestrian and cycling trails and seek opportunities generated by these increased connections to facilitate restoration.
- To develop the wider leisure use of public transport routes through its links to the GI Network to key attractions in the County.
- To use GI as a resource and catalyst for environmental education and community involvement.



### 4.3.3 Policy Recommendations for Water Management

- To seek improved access to the County's water resources for amenity and recreational purposes through the creation of Greenways and trails based upon green infrastructure principles.
- To utilise green spaces adjacent to watercourses to reduce flood risk without impacting on landscape or ecological features.
- To ensure coastal zone protection does not prejudice habitat and recreational assets.
- To incorporate habitat creation and conservation/recreational benefits of GI into flood risk management measures.
- To optimise and maximise the application of Sustainable Urban Drainage Systems (SuDS) to mitigate flood risk, enhance biodiversity, protect and enhance visual and recreational amenity; all in the most innovative and creative manner appropriate and in accordance with best practices.
- To seek promotion and piloting of green roofs and Green Streets through Council asset management plans and development led place making initiatives.
- To promote compliance with the Water Framework Directive by coordinating Green Infrastructure development with other water related strategic plans and actions (including flood management plans, water cycle studies, ground water and surface water protection).

## 4.4 Investment in Green Infrastructure

Traditionally local authorities provided the majority of funding for the delivery of and management of the components that make up Green Infrastructure. Increasingly this type of funding is more difficult to secure. As a result creative and innovative approaches to funding are required. It is important that a consideration of the long term funding provision for GI is undertaken at the outset of any further investment in GI. This is linked to ensuring that services are delivered efficiently and that the value of these GI assets is recognised. Examples of alternative funding mechanisms are provided below, and should be considered alongside EU and national funding sources.

- Local social enterprises set up by residents and local bodies to provide long term management. This can link into education and training funds, and can also have a positive impact on social cohesion.
- Involving the voluntary sector allows another route to funding not accessible by local authorities.
- Appropriate third party organisations to take forward the delivery and maintenance of open spaces as an alternative to a capital contribution through the planning system.
- Self-funding initiatives, that and draw upon a revenue stream, such as events or food production (Incredible Edible) from the open space.

Small scale investments in place making in the commercial areas of Dún Laoghaire is a proposed objective for the Council from 2015, and Green Streets would be an appropriate contribution to local GI and fit neatly into these small scale investments.

Resilience to environmental change, in particularly climatic change in temperature and rainfall will become a significant challenge for the State, and specifically in urban areas. There is a clear link in how GI can ameliorate spikes in heat and reduce runoff, and investment based around ensuring resilience of people and property to these challenges will be able to draw upon European and national funding. Leading the way, through pilots and innovation, is an important way for the Council to ensure that a full programme of GI investment can be implemented. This Strategy is a seminal first step in making the County more resilient to these environmental challenges, and GI is not a nice to have.

### 4.4.1 Natural Capital Forum

Techniques to identify and value the benefits provided by natural and semi-natural environments are becoming well established. The challenge is to implement mechanisms to reward and incentivise landowners for the natural capital and ecosystem goods and services their land can provide. In the Wicklow Mountains funding streams are being made available to enhance and manage the natural environment by providing alternative incomes to maintain sustainable rural communities. Without sustainable rural communities the ability to manage and maintain natural environments for biodiversity and recreation is diminished. Natural Capital is gaining traction in Ireland with the formation of the Natural Capital Forum, but its practical use in making the business case for investment in Green Infrastructure could be some way off. As a technique it could be helpful in attributing benefits across a number of sectors of GI and enhance the role of GI with business, government and funding agencies.

## 4.5 External Funding of Green Infrastructure

### 4.5.1 Planning Related Funding

The statutory basis for the operation of development contribution schemes is set out in the Planning and Development Acts 2000 to 2014.

Development contribution schemes are a central instrument in improving the quality and therefore the competitiveness of local authority areas, thereby establishing an environment in which enterprise can thrive and communities' progress. Development contributions provide critical resources to facilitate the funding of essential physical and social infrastructure that support the implementation of local authority development plans.

Development contributions provide the only statutory mechanism for capturing planning gain as part of the development management process. All planning permissions granted are subject to the conditions of the development contribution scheme in operation.

Local authorities have witnessed a steep decline in revenues from these schemes over recent years and it is certain that development contribution income will continue to be adversely impacted in the current economic climate.

There are three types of development contribution scheme, namely:

- General Development Contribution Schemes
- Special Development Contributions
- Supplementary Development Contribution Scheme

The General Development Contribution Scheme under Section 48 of the Planning and Development Acts is the most relevant to the delivery of the Green Infrastructure Strategy. Under this scheme planning authorities must draw up a development contribution scheme in respect of certain public infrastructure and facilities. GI which is provided by, or on behalf of, the local authority could qualify for funding through this mechanism, for example where it is driven by a need to reduce the impact of surface water runoff.

### 4.5.2 EU Rural Development Programme (RDP)

The EU Rural Development Programme (RDP) is part of the Common Agricultural Policy (CAP). The Department of Agriculture, Food and the Marine (DAFM) is the Managing Authority for Ireland's RDP and the expenditure on this Programme over the next programme period 2014 - 2020 in Ireland is anticipated to total €4.0bn.

The core priorities that Member States must have regard to in their programmes and which are directly relevant to the delivery of the GI Strategy include:

- Restoring, preserving and enhancing ecosystems dependent on agriculture and forestry
- Promoting resource efficiency and supporting the shift toward a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors
- Promoting social inclusion, poverty reduction and economic development in rural areas

The 2014-2020 Rural Development Programme for Ireland (RDPE) is now expected to be operational from early 2015. It is planned to include the following initiatives which are of relevance to rural land and water management and therefore the delivery of the GI Strategy:

- Agri-Environment & Climate Measures
- Leader

The Department of Agriculture, Food and the Marine (DAFM) are currently putting in place the structures which will serve to support the implementation of the RDP. There has been a low take up in this funding source in the Greater Dublin Area, but with the GI strategy focused on connecting the urban area with the mountains, and seeking to increase access and manage lands for reduced runoff, this source of funding should be explored. Leader funding has been successfully used by County Wicklow Partnership to alter land use from farmland to natural habitat, improving visitor safety and development of waymarked walks from villages.

### 4.5.3 EU Structural Funds

EU Structural funding seek to reduce regional disparities across Europe. The EU structural funding round for 2014-20 will be more challenging than previous rounds. For the first time the overall EU budget is smaller than before. Secondly, Ireland has been designated a "more developed region" and will not benefit as much from structural funds as before.

There are two main sources of EU funding – the structural fund programmes and special and other initiatives. Irish structural funds for 2014-20 will total €1.01bn. This EU funding will need match funding of up to 50% which is likely to be provided by the exchequer for "Operational Programmes". Operational Programmes will be announced in late 2014 and these set out how the various structural funds in Ireland will be spent.

The regulations for the Structural Funds in this new period places also place importance on providing direct access to funds for community and voluntary organisations through Community Led Local Development.

It is envisaged that Operational Programmes will be implemented at local authority level through the new Local Enterprise Offices (LEOs) and Local Community Development Committees (LCDCs). The EU regulations state:

*"Responsibility for implementation of local development strategies should be given to local action groups representing the interests of the community, as an essential principle."*

The LCDCs are expected to draft and deliver their action plans for local enterprise and local community development.

In addition to the Structural Fund programmes, the EU budget for 2014-20 will include additional programmes open to public authorities, private institutions and community sector groups. This is an additional and substantial source of potential development funding.

The Southern & Eastern Regional Assembly will have a key role in the delivery of the 2014-20 Operational Programmes. Investment in GI could align with EU funding requirements across several areas and in particular in the area of climate change adaptation. Mainstreaming climate change adaptation in EU policies was one of the pillars of the European Commission's 2009 White Paper "Adapting to climate change: Towards a European framework for action" and continues to be an important goal of the 2013 EU strategy on adaptation to climate change. The Operational Programmes need to be assessed when they are available to determine where the GI Strategy might be supported by EU Structural Funds.

### 4.5.4 EU INTERREG

A new EU transnational programme will replace the current interregional cooperation programme (INTERREG) to promote greater territorial cohesion. Involvement in these programmes is competitive and successful applications require strong partnerships of public authorities and civil society organisations. These are also managed through the Southern & Eastern Regional Assembly. The draft programmes applicable to the Dlr area are identified and summarised below.

### 4.5.5 Draft INTERREG VB Atlantic Area - Transnational Cooperation Programme

The Programme has priorities of particular relevance to Green Infrastructure delivery including Priority 3 'strengthening risk management systems' and Priority 4 of 'enhancing biodiversity and natural and cultural assets'. Examples of actions include:

- Actions to identify, assess and develop ecosystem services and green infrastructure
- Development of management, enhancement and assessment methods concerning natural areas and the ecosystem services provided
- Collecting and disseminating natural environmental data and modelling aimed at improving forecasts and environmental management
- Development of joint or comparative methodologies for defining and managing environmental protected areas

The Atlantic Area Programme operates in Euros and funds 75% of the total eligible project / partner budget, with the remaining 25% being made up of match-funding (which can include staff time).

The total available budget for the 2014-2020 Atlantic Area Transnational Cooperation Programme is to be confirmed (N.B. €131,590,766 ERDF + national co-financing). It is suggested that the Programme will allocate 27% to 'biodiversity and natural and cultural assets'.

### 4.5.6 Draft INTERREG VB North West Europe - Transnational Cooperation Programme

The Programme's low carbon priority includes a specific objective to 'reduce GHG emissions in North West Europe through international cooperation on the implementation of low carbon, energy or climate protection strategies'. This allows for 'implementing combined mitigation and adaptation solutions to demonstrate feasibility and refine the design and development of plans for the future'. Projects must deliver both a reduction in risks and a reduction in GHG emissions.

Examples of actions include:

- Structures which deliver outcomes in adaptation (reduction in risk) and mitigation (reduction in GHG emissions) which are sustainably designed and built
- Innovative approaches to environmental risk at a city or region level, which bring adaptation and mitigation benefits, e.g. Water Sensitive Urban Design
- Water planning at a catchment level to address adaptation whilst promoting mitigation

The Programme operates in Euros and funds 60% of the total eligible project / partner budget, with the remaining 40% being made up of match-funding (which can include staff time).

The total available budget for the 2014-2020 North West Europe Transnational Cooperation Programme is €620,459,134. The low carbon priority has a total budget of €244,223,276. Again this is a potentially useful source of funding for the water based actions arising from the GI strategy.

### 4.5.7 EU LIFE Programme 2014-2020

The LIFE Programme is the EU's dedicated funding programme for the environment and climate action. The Programme covers all 28 EU Member States and is managed centrally by the European Commission. The Programme is open to public and private bodies registered in the EU.

The 2014-2020 LIFE Programme has two sub-programmes:

- 'Environment' with a budget of €2,592.5 million, encompassing environment and resource efficiency (including water as a specific theme), nature and biodiversity, and governance and information
- 'Climate Action' with a budget of €864.2 million, including adaptation, mitigation and governance and information



Specific priorities, funding allocations and assessment criteria are set out in multi-annual work programmes. The 2014-2017 work programme lists specific priorities which could be relevant to County GI delivery:

- Planning and establishment of natural water retention measures
- Promoting flood and drought risk management through: extreme event prevention and protection tools; and integrated risk assessment and management approaches
- Addressing hydro-morphological pressures identified in River Basin Management Plans
- Re-naturalising river, lake, estuary and coastal morphology and/or recreating associated habitats, including flood and marsh plains
- Awareness-raising on Water Framework Directive obligations and opportunities

In addition, the work programme makes reference to support for implementation of adaptation strategies under the climate action sub-programme. These programmes tend to be undertaken on sub river basin basis, but could form a component part of a larger catchment based response.

#### 4.5.8 EU Horizon 2020

Horizon 2020 is a €79 billion EU funding programme to support research and innovation excellence. The programme covers all 28 EU Member States as well as a number of associated / third countries. It is managed centrally by the European Commission and funds collaborative research / innovation projects involving at least three organisations from different countries. The Programme largely covers 100% of costs, with innovation actions being funded at 70% for profit-making organisations.

The Programme is structured around three pillars: excellent science, industrial leadership and societal challenges. The 'societal challenges' pillar includes the following supporting priorities of potential relevance to the DL&R GI Strategy delivery:

- Climate action, environment, resource efficiency and raw materials with a budget of €3,081 million
- Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bio-economy with a budget of €3,851 million

The 2016-17 work programme is in development and is likely to be where opportunities could lie. Again this is worth tracking and seek opportunities as they arise. It has potential to be used as a priming or pilot fund for new forms of GI, such as Green Streets.

#### 4.5.9 Tourism Related Funding

Destination Dublin, the strategy for tourism growth in the Dublin Region, recognises that visitors can be attracted to the coastline, parks and open spaces in urban areas and the experiences in the hills and mountains. The proximity of coastal and upland destinations to the city centre are considered to have a huge potential in broadening the appeal of Dublin to visitors of all profiles. The GI strategy acknowledges the links of the Green Network extending into a regional provision enables a sustainable and attractive access to an exciting range of formal and natural green destinations. Therefore GI may have significant potential to access tourism related funding sources. Some GI related investment may be attractive to be self-funded as part of a tourism based enterprise.

Green Infrastructure will seek to change the interaction and uses made of the green assets in the County. Rebranding these parks as part of a tourism offering could see an extension of their use beyond their original purpose and an additional source of revenue. This would need to be undertaken sympathetically in recognition of the heritage value of formal parks, but parks under the GI strategy will start to deliver many additional benefits over and above being well cared for formal parks.

#### 4.6 Planning Tools

Planning can play a vital role in the delivery of Green Infrastructure projects. Mechanisms which should be considered include the following:

- The GI strategy has a clear vision and policy support from the forthcoming County Development Plan 2016-2022
- Development contributions will remain an important contribution to the vision
- The GI strategy has produced a strong GI framework and that will encourage planners to respond to opportunities as they arise, and a toolkit is provided in Appendix C
- The GI strategy can unlock complex interactions between development, landscape design and management, housing, flood management, biodiversity and social cohesion, and is a potential powerful tool

## 4.7 Key Actions

The Green Infrastructure strategy has a foundation based on existing initiatives, such as the Smarter Travel programme, which have been partly funded by national and local resources or have been driven by local groups (Friends of Fitzsimons Wood). Dlr has been successful in their provision of open spaces and off-road cycle routes. GI is a concept that unites a range of disciplines and interests which can facilitate collaborative working. This is helpful in removing potential competing priorities. However it does mean that a structured investment plan for GI is often challenging, as it will involve many parties, who will have their own programmes and funding constraints. The GI strategy has a strong spatial framework, with a clear focus on enhancing and creating green spaces and providing linking corridors. This can then be the driver for seeking internal and external funding, but it should be noted that GI is also supported by smaller scale interventions, such as public realm improvements, green roofs and walls.

### 4.7.1 GI Corridors

An overview of priorities and funding sources for the Green Infrastructure strategy components are provided in Table 4.A.

GI Corridor	Short Term Priorities 2015 - 2018	Possible Short Term Funding Sources	Longer Term Priorities 2019 - 2022	Potential Funding Sources
1. Coastal	Connections and access routes using Greenways, Cycle Routes and Green Streets	Smart Travel Initiative  External funding through use of a Pilot Study or DLR	Ecological corridor along cycle route to develop multifunctional benefits along corridor	External
2. River Dodder to the Mountains	Extension of Dodder Linear Park	Greenway funding through Smarter Travel	De-culverting of watercourses  Flood storage in Marlay Park	External  Development contributions
3. Blackrock to Mountains	FitzSimon's Wood – development integrated management and GI enhancement plan  Access and improved connections to Sandyford Business District	Joint development with local environmental/ community groups.  External funding with Council input  Greenways via Smarter Travel Initiative  Partnership with Sandyford Business District	Extension and GI enhancement of FitzSimon's Wood as a transition park  Development of Fernhill Gardens into a Gateway Park / Regional Park	External
4. Dún Laoghaire to Mountains	Development plan for creation of a Gateway park at Jamestown  Continue initiatives for Greenway connections to form complete route	Internal  Smarter travel and development led	Develop Jamestown Park  Green street enhancement of corridor in urban areas	Internal and External  External Climate change adaptation measure
5. Intra Urban	Enhance corridor for multifunctional benefits – habitat action plan linked to enhanced flood risk management  Greenway link to Killiney Strand	Mix of funding sources  Smarter Travel Initiative	Green Streets	External Climate change adaptation measure
6. Gateway Parks	Access and connections  GI led management and enhancement plan for proposed parks at Jamestown and Ticknick in partnership with Dublin Mountains Partnership	Smarter Travel Initiative  Dublin Mountains Partnership	Create Gateway Parks  Enhance Greenways for multifunctional benefits through use of GI principles, including improvements to "hard" crossings of motorways to create a continuous GI corridor	External  External

Table 4.A: Green Infrastructure Corridor Priorities.



## 4.7.2 Key Thematic Actions to Support Implementation of the Strategy

### Accessibility, Recreation, Health and Well-Being

Barriers have been identified as a key challenge for the implementation of the Green Network corridors. Some of the physical barriers can be overcome by a footbridge for example, and the cycle network has resolved some of these barriers across transport infrastructure. However, a review of these crossings should be undertaken from a GI perspective, so that opportunities are taken to provide connectivity of people, habitats or watercourses, where feasible and resources allows.

Each corridor should be subject to a detailed multi-disciplinary feasibility study so that where possible technical solutions can be identified to barriers and incremental actions can be taken by the Council or local groups.

Access over private land will remain a barrier, and existing mechanisms for resolving these issues should be explored using the experience gained through Dlr's participation in the Dublin Mountains Partnership. The socio-economic and health benefits of a well-functioning GI, should be advanced in any such exploration.

This Green Infrastructure strategy should be circulated to a range of bodies and groups who have a health and well-being agenda, such as Healthy Ireland, Institute of Public Health, HSE and local voluntary health groups. The Council could initiate a joint action plan on the health and well-being aspects of the GI strategy. Small scale and incremental actions could be identified, and the Council could work with these bodies to facilitate provision of land for allotments and community gardening. The Council could assess and prioritise, in line with the findings of the strategy and the demographic character of the County, areas where provision of land and facilities would meet the requirements for activities such as community gardening and other GI health related uses.

### Natural and Cultural Heritage

In the long term, private land owners and semi-state bodies such as Coillte, should be encouraged to use their land management to deliver Green Infrastructure benefits and assets. Land management has a large impact on water quality and flood risk downstream, the cohesion of habitats and ecological corridors such as woodland and hedgerow management, and access to cultural heritage, all of which can deliver multiple benefits. Dún Laoghaire-Rathdown County Council should develop a toolkit in partnership with landowners and stakeholders to identify what incentives are available to landowners, how to apply for these and how to construct and manage Green Infrastructure.

There are some significant areas of open space or lengths of watercourse through large areas of land in single ownership. These include golf courses (e.g. where culverts convey flows from the Little Dargle) and institutional land (e.g. the Elm Park Stream flows through U.C.D in culverted and open channel sections). Some of these are strategic hubs for connecting existing Green Infrastructure. A review of de-culverting potential should be undertaken in order to assess whether it should remain merely an aspirational aspect of the GI strategy. This study would identify where opportunities could arise for incremental removal of culverts through new development proposals, in order to improve habitat connectivity and more effective water management

### Water Management

A review of the water management aspects of how the existing green spaces and water bodies could be enhanced to deliver the strategic outcomes associated with Green Infrastructure should be commissioned. Further flood attenuation, habitat enhancement and sediment management have been identified in the analysis. This should integrate the EU Floods Directive and Water Framework Directive programme of measures with the provision of an enhanced GI along watercourses. As this is integral to achieving the GI benefits Dún Laoghaire-Rathdown should engage with the forthcoming assessments under the CFRAM Flood Risk Management Plans and Cycle 2 River Basin Management Plans. The Council is a Steering Group member on the OPW led ECCFRAM study due to be completed in 2016. The GI Strategy should be provided to the OPW in order that any flood risk management measures proposed along watercourses in the County utilise the water management benefits arising from the GI corridors. These watercourses should be reviewed first, and it is recommended that the current Kilbogget Park flood study is used as a pilot to explore some of these integrated issues, especially around sedimentation within the ponds and watercourse and how that is managed sustainably in the long term. With this information Dún Laoghaire-Rathdown County Council can influence the long term strategy for flood management being prepared under the CFRAM programme and ensure that, where feasible, flood relief schemes provide a positive GI outcome. Funding of OPW schemes allow for reasonable budget headings for landscaping, environmental mitigation and heritage, and the GI strategy could be useful in focusing that spend in productive GI outcomes.

Green Streets have been identified in the strategy for use as connectors to the Green Infrastructure corridors. This is a new concept in Ireland, but effectively used in Sweden, the UK and USA to manage stormwater runoff, regenerate neighbourhoods, and create high quality places. Multi-functional Green Streets constitute GI corridors and can create links to river corridors and open spaces. Green Streets improve accessibility and well-being, enhance habitat and biodiversity, strengthen ecological corridors, reduce the rate and volume of runoff and urban pollutants that enter storm drainage networks, providing overall improvements in environmental quality,

flood risk, water quality and wastewater treatment. The concept of Green Streets can be applied to main roads and local residential streets, as appropriate in terms of scale and other imperatives (e.g. Smart Travel - cycleways).

**This strategy recommends that Dlr initiate a pilot Green Street project, as part of a new development and/or the regeneration/retrofitting of an existing urban streetscape(s).**

Integration of the Strategic Flood Risk Assessment and the water management zones identified in this Strategy is required so that land can be safeguarded for flood management uses and so that runoff from new developments are limited to safe limits.

Green roofs have been shown in research to have a significant impact on reducing storm water runoff. Using the water management zones in this strategy a retrofitting plan could be developed, starting with pilot public buildings as a means of leading the way and testing design methods. Lessons learnt from the new green roof installation at Ballyogan depot should be used to inform this element of the Delivery Plan. There is also greater potential through the development management process to seek demonstration projects using new development to trial green roofs and understand the market appetite for these approaches in the County.

## 4.8 Monitoring and Review

In order to meet the visions, objectives and actions in the Green Infrastructure strategy, a programme of monitoring and review will need to take place. This will also allow the strategy to be modified as required. It will also ensure that the strategy can respond to changing circumstances, such as climate change, demographics, funding criteria and legislative change. It will necessitate the setting up of a Monitoring Group.

Whilst it is appropriate for the monitoring and review programme to tie in with the lifetime of the Development Plan (2016-2022), some programmes, such as those related to water management, may have their own cycles of monitoring:

The monitoring of water quality, sediment and erosion should complement or run alongside the River Basin Management Planning cycles under the Water Framework Directive. However, not all of the watercourses, lakes and ponds in Dún Laoghaire are included as waterbodies in the River Basin Management Plan, but still should be monitored at a County level.

As specific projects are realised there may be opportunities to monitor and review Green Infrastructure elements and benefits before and after implementation.

The Green Infrastructure strategy has identified a set of high level Green Corridors, and they will have their own focus and success metrics. One of the main monitoring and review requirements will be the implementation of the strategy as set out in Chapter 3.

However, the success of Green Infrastructure will not only be measurable by these metrics. The overall vision set out within this strategy describes a slow behavioural change in response to the provision of a multifunctional GI asset base. Examples of indicators which can show the levels of success of the implementation of the GI strategy are provided. They can be used in the monitoring and review process. Use of the indicators should take account of the availability of appropriate, adequate resources, the capacity to generate up-to-date data sets and any other factors that may influence the indicators.

General Indicators	Accessibility, Recreation, Health and Well-Being Indicators	Natural and Cultural Heritage Indicators	Water Management Indicators
Identification and utilisation of funding sources	Number of people cycling and walking to work / school	River habitat and geomorphological surveys	Number of green roofs
Number and range of organisations aware and using the GI strategy within their plans and programmes	Number of people using opens spaces and sports facilities	Increase in tree cover and diversity of age profile	Water quality
Green Infrastructure training across Dlr Departments and major developers and agents	Number of Green Streets	Number of Green Streets	Bathing water quality
Inclusion of GI in new developments (using GI toolkit)	Number of allotments in active use Use of public transport for outdoor leisure activities Accessibility across transport infrastructure	Public perception of GI in Dlr	Decrease in sediment and debris at key locations Number of Green Streets

**Table 4.B: Potential Green Infrastructure Indicators to be used in Monitoring and Review of the Strategy**

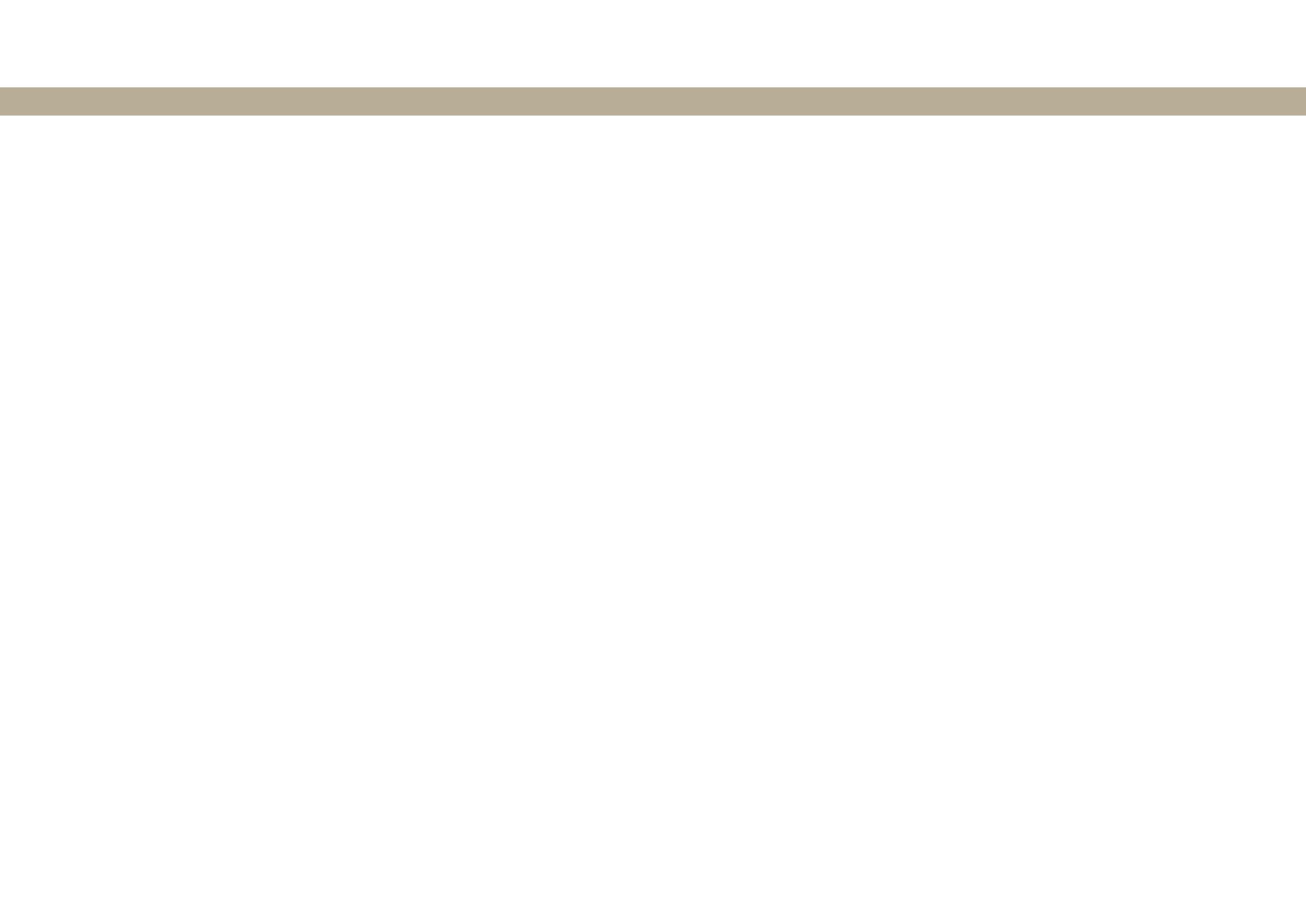




Photo 66: Running in Kilbogget Park.

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# Appendices

## APPENDIX A Baseline Maps

The mapping approach for this GI Strategy is based upon the typology developed in the Mersey Forest Green Infrastructure Strategy and the parks and open spaces hierarchy for Dún Laoghaire-Rathdown. The definitions used in the mapping are as follows:

**Appendix A, Table A: Definitions of Typology Land Cover / Use Type**

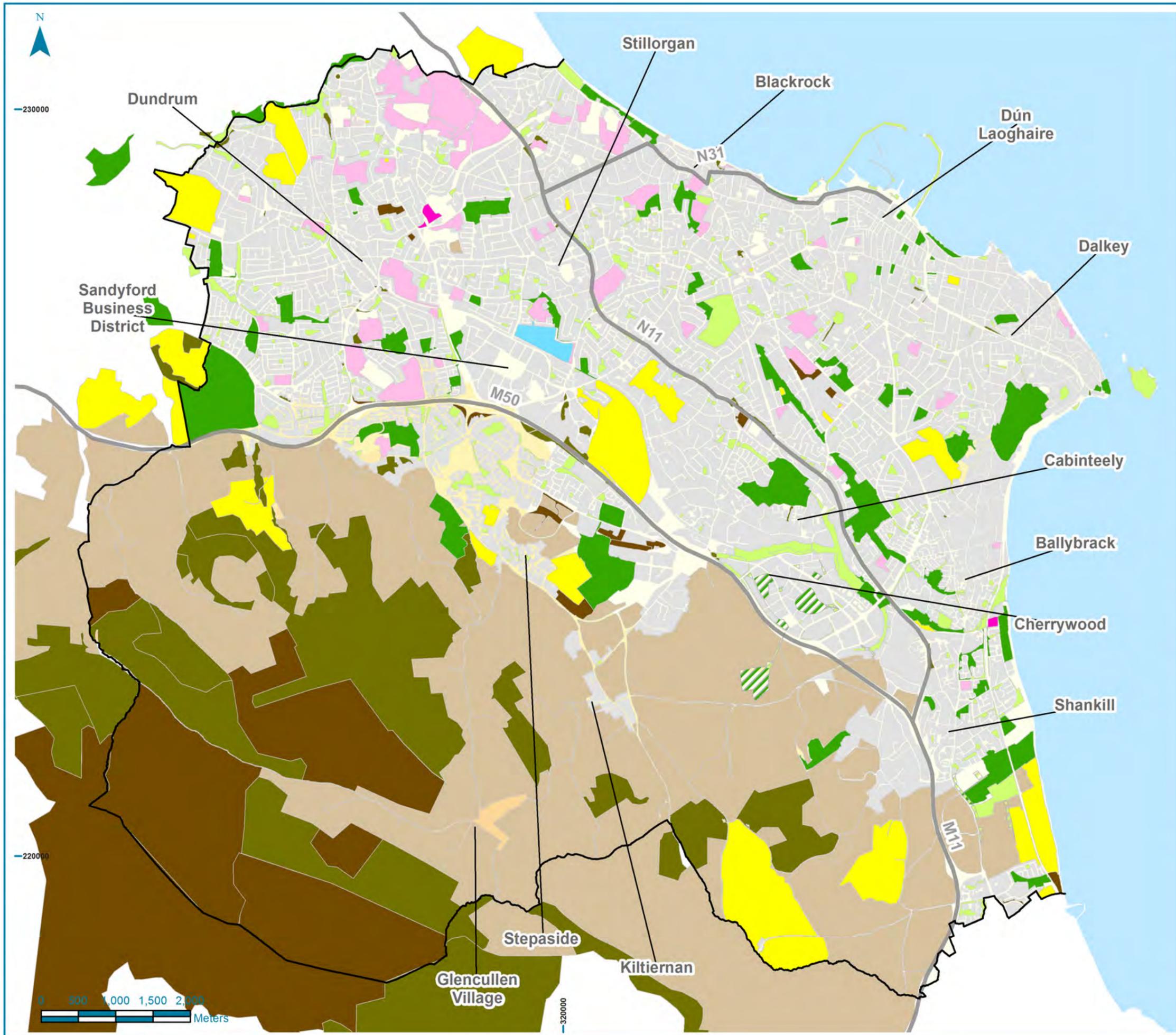
Typology (Land Cover/Use Type)	Description
Agricultural land	Land managed for agriculture, including grazing lands, crop production fields and hedgerows. Potentially irregular field margin trees may be included.
Allotment, community garden or urban farm	Allotments are small plots which collectively make up a larger green space. These plots are available for members of the public to rent for the cultivation of fruit, vegetables and flowers. Community gardens and urban farms are community-managed projects ranging from wildlife gardens, to fruit and vegetable plots on housing estates, community polytunnels, to large city farms.
Coastal habitat	Beaches, sand dunes, marshes, mudflats and semi-natural open land by the coast.
Derelict land	Land which has been disturbed by previous development or land use but is now abandoned. Waste or derelict land is often re-colonised by processes of natural succession. Land is classed as derelict whilst it is in the early stages of natural succession. As succession proceeds land that may be officially classified as derelict land by the local authority, will have a different Green Infrastructure type e.g. grassland or woodland (or will fall under non Green Infrastructure).
Grassland/ heathland/ moorland or scrubland	Grassland which is not agriculturally improved. Could include established vegetation on reclaimed derelict land which is not part of a formal recreation green space. Includes downlands, commons and meadows. Also includes areas of moorland and heathland vegetation consisting mainly of ericaceous species, and including moorland grass, shrub moor, shrub heath and bracken. Likely to include some commons within urban areas. Scrubland areas predominantly consist of shrubs, with grasses and herbs also present.
Green networks	These are the networks of parks and open spaces, the existing and proposed Greenways, the biodiversity corridors, the cycle routes, the waterways and river valleys, the coastal area and the mountains, that are features of the County. They can provide for long distance pedestrian and cycle routes throughout the County and can link the parks and open spaces with the entire Green Infrastructure in the County. Once they are formally identified, mapped and developed they can become an extremely valuable resource for the County and the region.

Typology (Land Cover/Use Type)	Description
Institutional grounds	<p>Green space in the grounds of institutions such as schools, universities and colleges, hospitals and nursing homes, and associated with commercial and industrial premises. Land usually consists of expanses of grass, scattered trees, hedgerows and shrubs. Outdoor sports facilities are not included.</p> <p>There are many large areas of institutional land in Dún Laoghaire-Rathdown which present both opportunities the provision of multiple benefits from Green Infrastructure and also barriers to accessible Green Infrastructure.</p>
Outdoor sports facility	<p>Includes sports pitches, school and other institutional playing fields, golf courses and other outdoor activities. Usually consist of vegetated sports surface and boundary shrubbery, trees and hedges. Can be publicly or privately owned and often occur within parks.</p>
Parks, Gardens & Public Open Spaces	<p>Includes urban parks, country parks and formal gardens (including ones where you may have to pay for access). Generally designed for public access and enjoyment, combining a variety of landscape and horticultural elements. Extraneous facilities for the public may be present onsite which enhance visitor attraction.</p> <p><b>National Parks</b> are designated nationally and managed by the National Parks and Wildlife Service (NPWS). The Wicklow Mountains National Park follows part of the border between Dún Laoghaire-Rathdown and Wicklow. It is one of six in Ireland and is the only National Park not on the West Coast.</p> <p>The <b>Dublin Mountains</b> is an area of upland agricultural, forestry and open grassland which contains a network recreational access routes and activity centres. There is no formal boundary to the Dublin Mountains however within this area there is Coillte forestry land which is accessible to the public and is marked as such in the analysis.</p> <p>In Dún Laoghaire-Rathdown parks and gardens are subdivided into <b>Regional Parks, District Parks, Local Parks, Amenity Open Space, and Civic Spaces</b>.</p> <p><b>Regional Parks</b> are the premier parks in the County, which provide for a wide range of uses and attractions and include opportunities for both high quality active and passive recreation. They are generally large in size, with the Peoples Park in Dún Laoghaire being the exception. They include facilities such as playing pitches, changing rooms, toilets and regional playgrounds for children of differing age groups. They may accommodate food and craft markets and cafes/tea rooms where appropriate. They also play an important role in terms of biodiversity due to their size and the ecosystems they sustain.</p> <p>The <b>District Parks</b> provide for a range of needs for a number of neighbourhoods. They offer a wide variety of uses and facilities and they provide for both active and passive recreation. The active recreational facilities in these parks usually include playing pitches, courts and multi use games areas or playground areas. They also feature biodiversity corridors and areas.</p>



Typology (Land Cover/Use Type)	Description
Parks, Gardens & Public Open Spaces (continued)	<p><b>Local Parks</b> are within easy reach of most dwellings in the locality. They provide for the needs of the local neighbourhood. They can provide for kick about areas, exercise equipment and seating areas.</p> <p><b>Amenity Open Spaces</b> are commonly located within residential areas and housing estates and they facilitate mainly passive recreation, casual play areas, pocket parks and they visual amenity for residents. Their function is usually as a green space but their landscape value can sometimes be minimal because of poor design. They include the left over green spaces within housing and other forms of development, as well as most road verges.</p> <p><b>Civic Spaces</b> are located in the urban centres close to a civic, institutional and commercial buildings and generally feature hard landscaping with planting and seating areas. They allow for sitting, meeting and eating, as they are generally located close to cafes and restaurants. Examples include the plaza's and public open space at Dún Laoghaire Harbour.</p> <p>Land used as <b>burial grounds, including cemeteries and churchyards</b> is usually grass covered with occasional shrubs and trees and is part of the Green Infrastructure network.</p>
Recreational Access Routes	<p>Recreation Access Routes are located within the lands under the control of Coillte. Coillte Teoranta, the State Forestry Board, was established to manage the public forest built up since the commencement of State planting and is the largest provider of forest recreation in Ireland. Coillte's commitment to recreation is underpinned by its membership of the Dublin mountain partnership and its commitment to the Dublin Mountains Strategic Plan for Outdoor Recreation 2007-2017. It is an objective of the Council to secure the retention of those established Recreation Access Routes and to investigate the provision of additional agreed Recreational Access Routes in conjunction with the Dublin Mountains Partnership.</p> <p>The Dublin Mountains Way and Wicklow Way are waymarked routes that follow both Recreational Access Routes and Rights of Way in part.</p>
Public Right of Way	<p>Legally designated as a public right of way. For the purpose of the Green Infrastructure strategy only off-road public rights of way have been mapped.</p>
Street trees	<p>Generally in urban areas, a row/collection of individual trees along the side of a road. Trees will vary in size and species depending on location and size of street. Usually located on the pavement edge in tree pits, requires reasonably wide pavements. Tree pits may be planted with small flowering plants.</p> <p>The identification of street trees is challenging and is not always possible at the County-wide scale due to the overlap with streets and other land uses. They contribute to the connectivity between Green Infrastructure hubs and are considered further in detailed analysis.</p>

Typology (Land Cover/Use Type)	Description
Water body	Expanses of open water, including large lakes, small ponds, reservoirs and harbours. The sea is also classed as a water body.
Woodland	All forms of woodland including deciduous woodland (both ancient semi-natural and woodlands of more recent origin) and mixed and coniferous woodland (including plantations and shelterbelts). Includes newly planted woodland. Small clusters of trees will be classed as woodlands.
Green roof	<p>Roofs of buildings, bus shelters or any other form of construction which are partially or completely covered with vegetation. Vegetation may be sedums, plants, perennials, grasses, trees and shrubs.</p> <p>There is no data on green roofs in Dún Laoghaire-Rathdown to be shown on the County-wide mapping.</p>
Orchard	Areas populated with fruit bearing trees, can be publicly or privately owned, could be for commercial selling or local community use.
Private domestic garden	<p>Privately owned green space within the curtilage of individual dwellings, which is generally not publicly accessible. These plots of private land vary in size but often make up a significant part of the green fabric of urban areas. Land may include trees, shrubs, grass and flowering plants.</p> <p>At the County-wide level there has been no mapping or analysis of private domestic gardens. When looking at detailed locations the cumulative benefit of private domestic gardens on Green Infrastructure hubs and connections will be considered.</p>
Watercourse	All areas of running water, including large rivers, small streams, canals and aqueducts. In Dún Laoghaire-Rathdown there are a number of culverted watercourses which are a barrier to the connectivity between Green Infrastructure hubs.
Wetland	Land dominated by wet habitats, including fen, marsh, bog and wet flush vegetation. Wetland associated with the coast, such as salt marshes, is classified as coastal habitat.



**Legend**

- County Boundary
- Main roads
- Built up areas

**Green Infrastructure Typology**

- Agricultural land
- Allotment, community garden or urban farm
- Grassland/heathland/moorland or scrubland
- Institutional Grounds
- Open Space
- Open Space (proposed)
- Outdoor Sports Facility
- Parks & Gardens
- Parks & Gardens (proposed)
- Water body
- Woodland

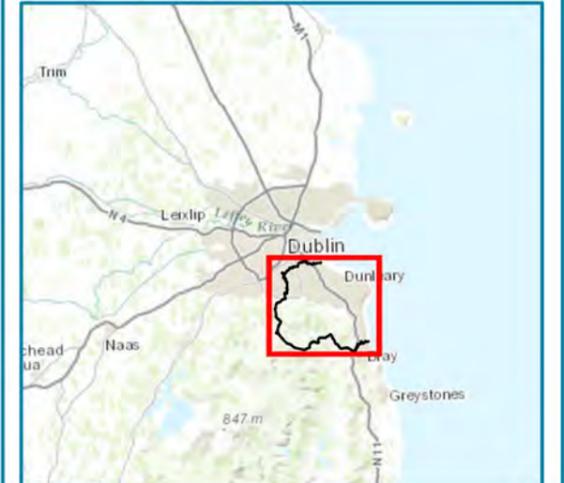
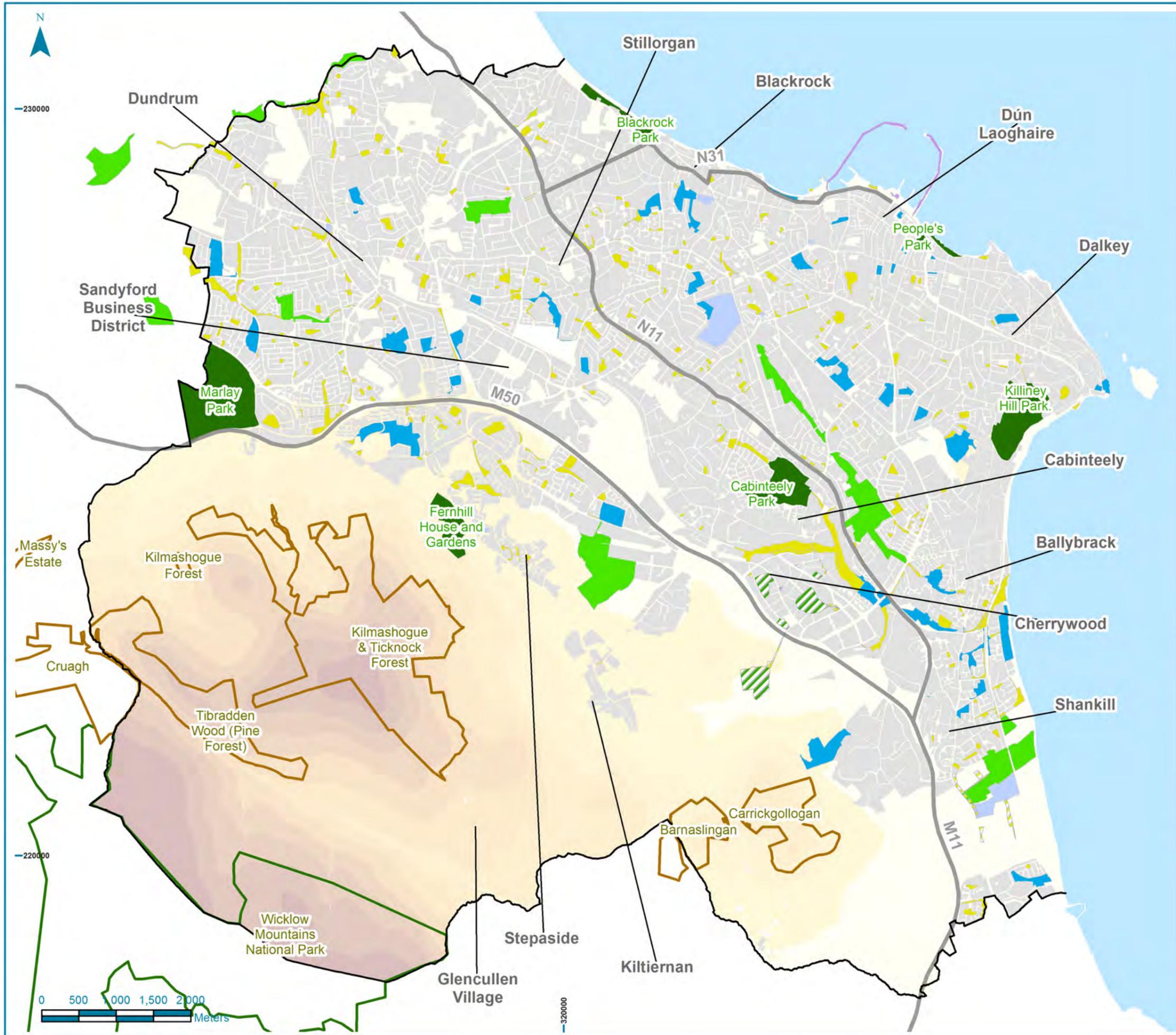
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for  
**Dun Laoghaire Rathdown County Council**  
**Green Infrastructure Strategy**  
**A1 Open Spaces**

Drawn by: Tom Sampson	Date: 19/02/2015	Scale: 1:50,000
Checked by: Tom Sampson	Date: 19/02/2015	Original @ A3
Approved by: Deidre McDonnell	Date: 19/02/2015	
File Name: 2014s0960_023_08 - A1 Open Space		
Status: Final Map		



**Legend**

- County Boundary
- Main roads
- Built up areas

**Parks and Open Spaces**

- National Park
- Coillte Land
- Regional Park
- District Park
- Local Park
- ▨ Parks (proposed)
- Amenity Open Space
- ▨ Amenity Open Space (proposed)
- Civic Space
- ▨ Civic Space (proposed)
- Cemeteries and Burial Grounds

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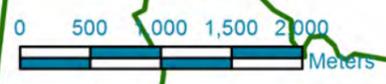
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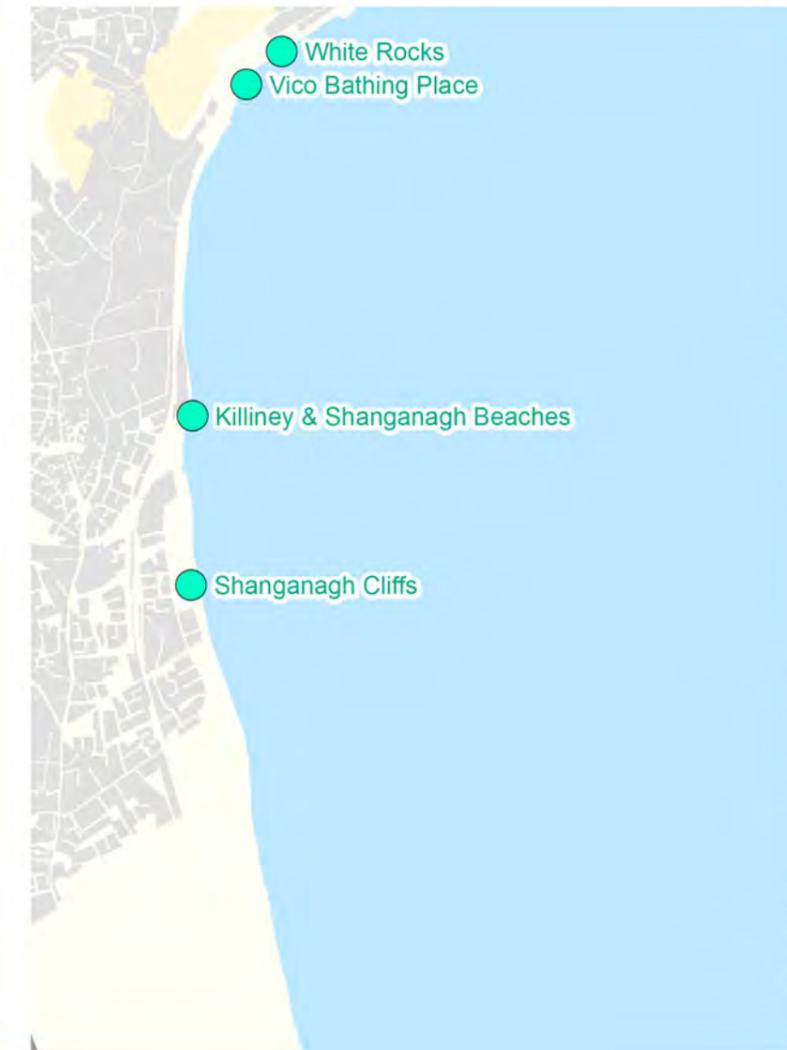
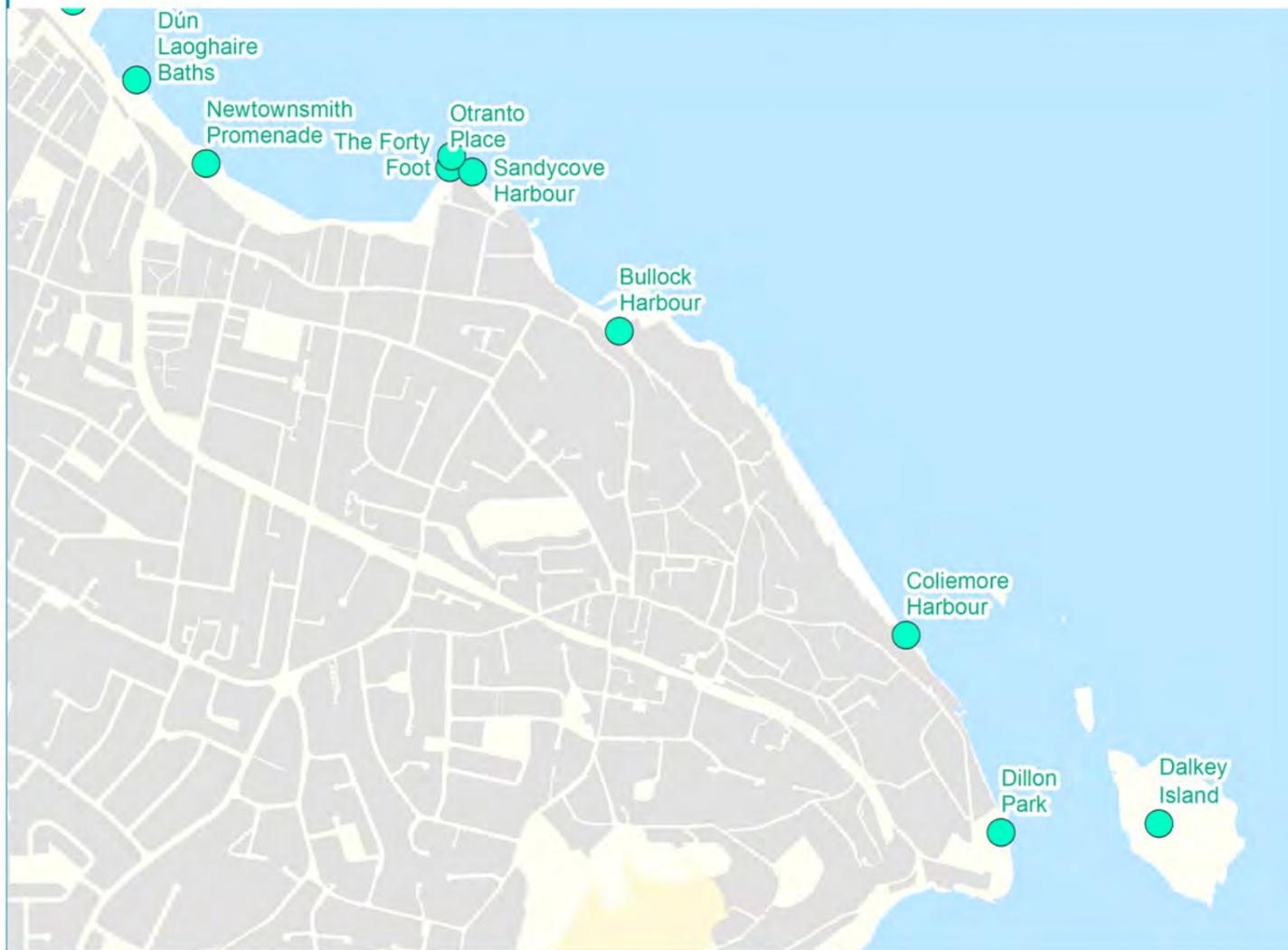
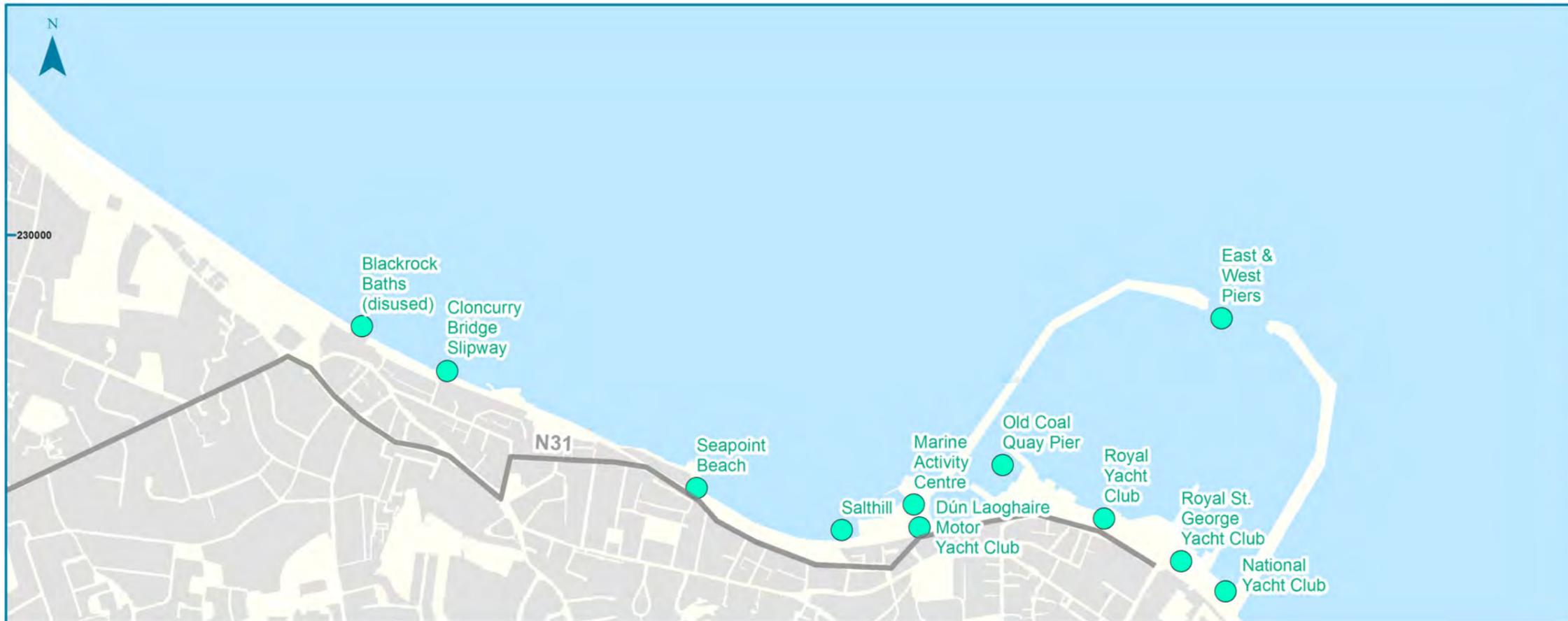
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**A2 Public Open Spaces**

Drawn by:	Tom Sampson	Date:	19/02/2015	Scale:	1:50,000
Checked by:	Tom Sampson	Date:	19/02/2015	Original @ A3	
Approved by:	Deidre McDonnell	Date:	19/02/2015		
File Name:	2014s0960_029_08 - A2 Public Open Space				
Status:	Final Map				

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- Legend**
- County Boundary
  - Main roads
  - Built up areas
  - Coastal Features

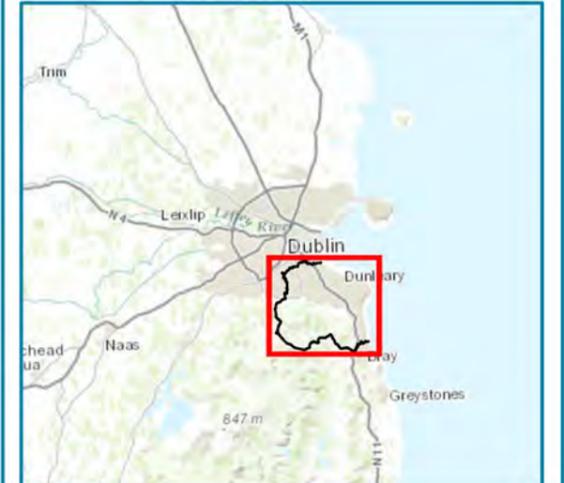
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**A3 Recreational Features of Interest Along the Coast**

Drawn by:	Tom Sampson	Date:	02/12/2014	Scale:	1:18,680
Checked by:	Tom Sampson	Date:	02/12/2014	Original @ A3	
Approved by:	Deidre McDonnell	Date:	02/12/2014		
File Name:	2014s0960_047_05 - A3 Recreational Features of Interest Along the Coast				
Status:	Final Map				



**Legend**

- County Boundary
- Main roads
- Built up areas
- River Type**
- Culverted - private
- Culverted - public
- Open - private
- Open - public

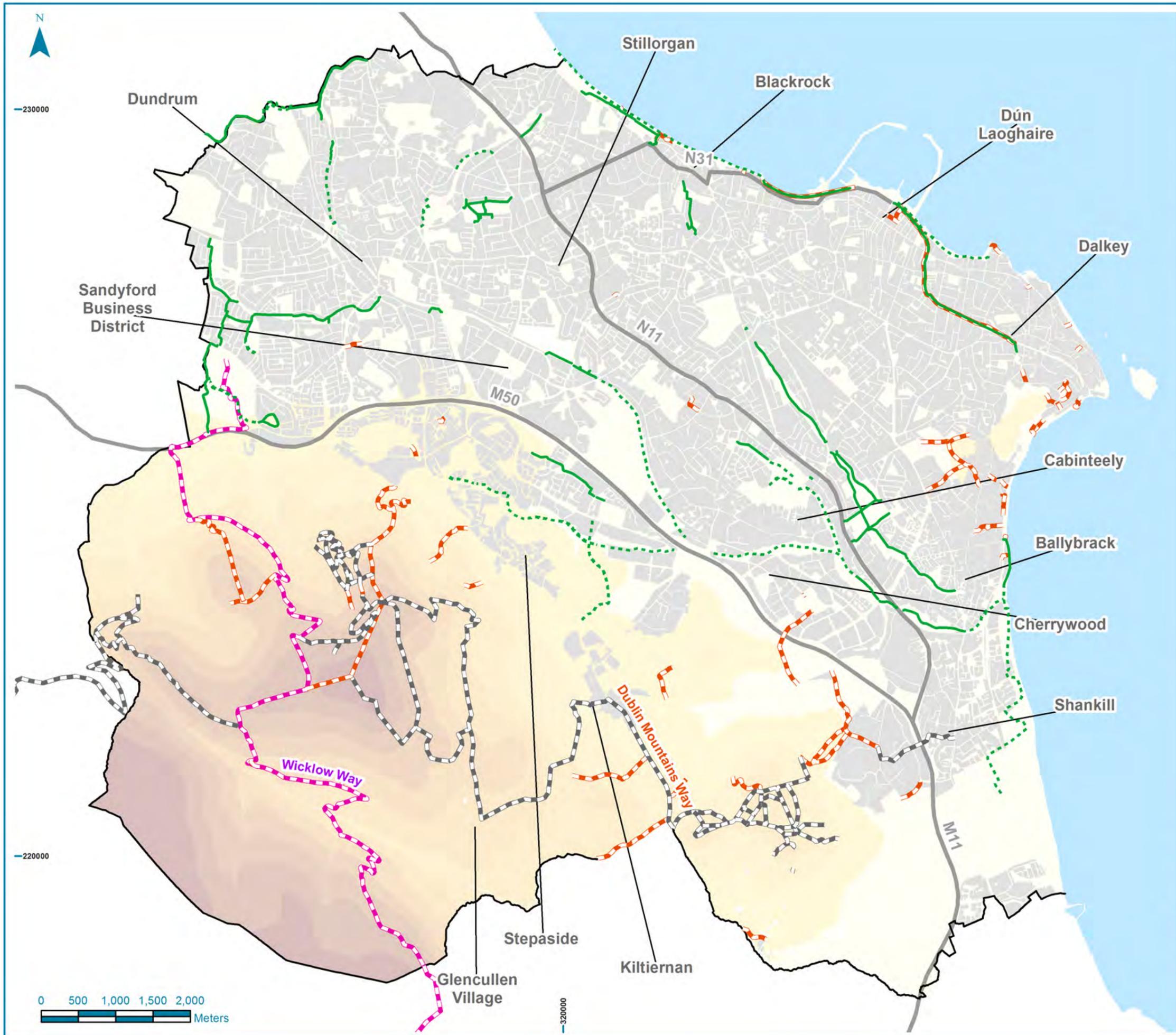
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**A4 Rivers**

Drawn by: Tom Sampson	Date: 02/12/2014	Scale:	
Checked by: Tom Sampson	Date: 02/12/2014		<b>1:50,000</b>
Approved by: Deidre McDonnell	Date: 02/12/2014		Original @ A3
File Name: 2014s0960_037_06 - A4 Rivers			
Status: Final Map			



**Legend**

- County Boundary
- Main roads
- Built up areas

**Off Road Cycle and Pedestrian Network**

- Proposed off road
- Existing off road

**Recreation Access Routes**

- Public Right-of-Way
- Recreation Access Route
- Wicklow Way

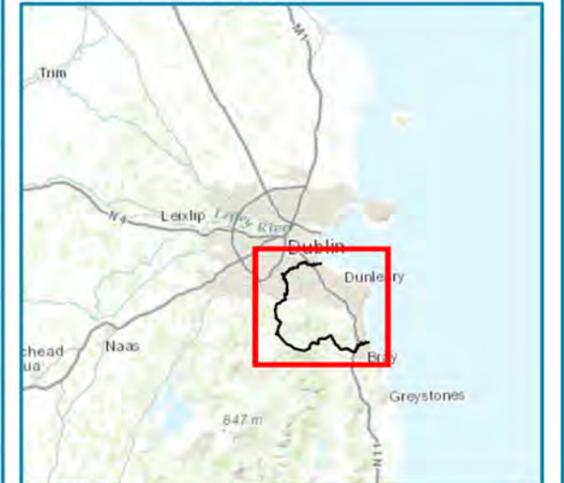
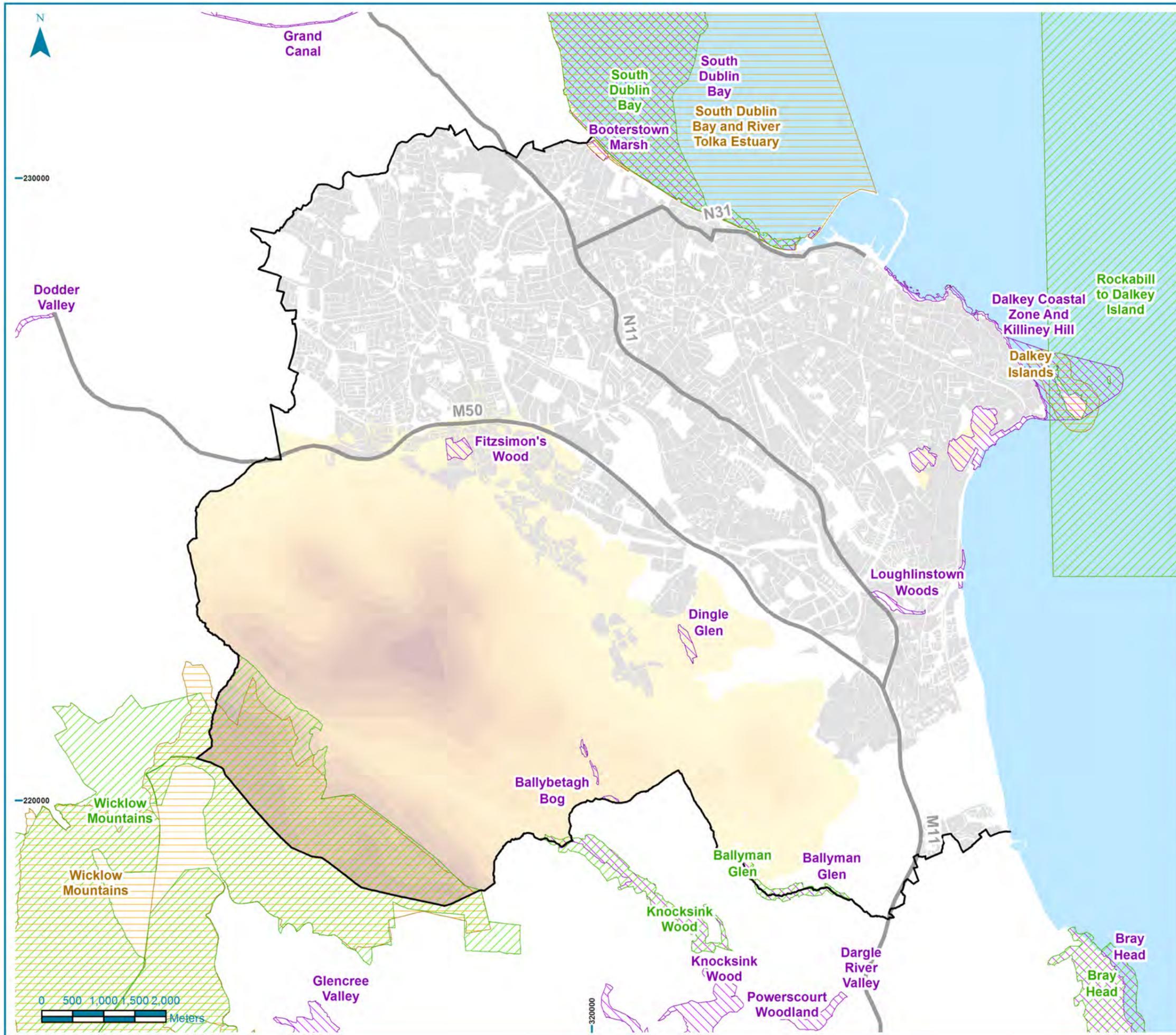
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**A5 Recreational Access Routes, Rights of Way and Greenways**

Drawn by: Tom Sampson	Date: 02/12/2014	Scale: 1:50,000
Checked by: Tom Sampson	Date: 02/12/2014	Original @ A3
Approved by: Deidre McDonnell	Date: 02/12/2014	
File Name: 2014s0960_025_11 - A5 Recreation Access Routes, Rights of Way and G		
Status: Final Map		



- Legend**
- County Boundary
  - Main roads
  - Built up areas
  - ▨ Special Areas of Conservation
  - ▨ Special Protection Areas
  - ▨ proposed Natural Heritage Areas

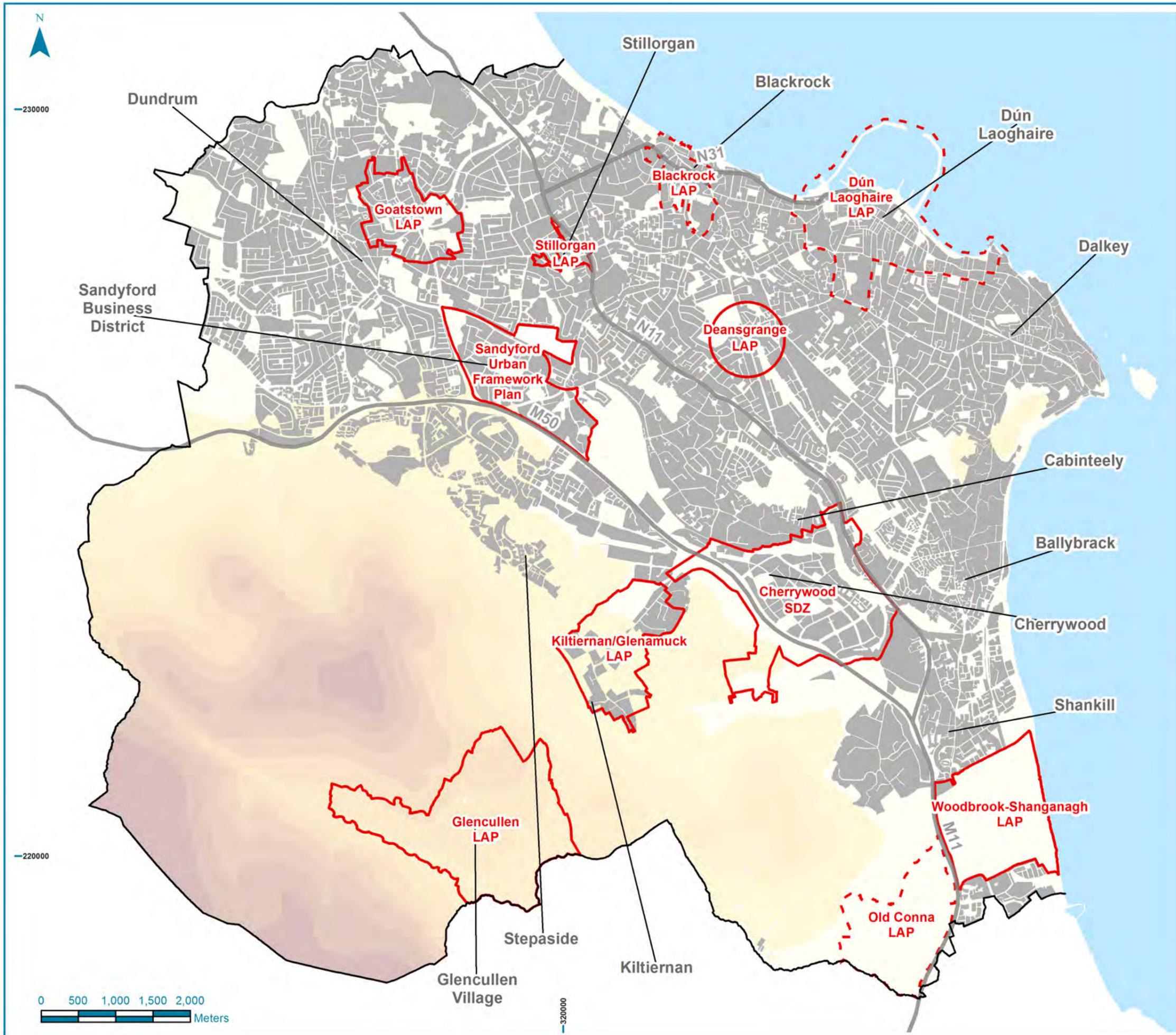
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**A6 Environmental Designations**

Drawn by:	Tom Sampson	Date:	02/12/2014	Scale:	1:60,000
Checked by:	Tom Sampson	Date:	02/12/2014	Original @ A3	
Approved by:	Deidre McDonnell	Date:	02/12/2014		
File Name:	2014s0960_027_08 - A6 Environmental Designations				
Status:	Final Map				



**Legend**

- County Boundary
- Main roads
- Built up areas

**Local Area Plan Status**

- adopted
- ⋯ proposed

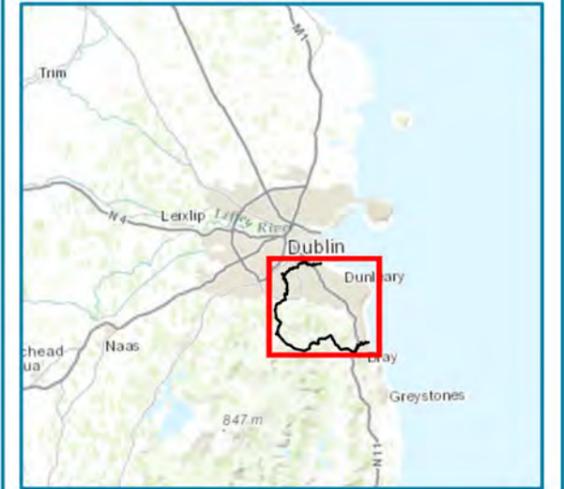
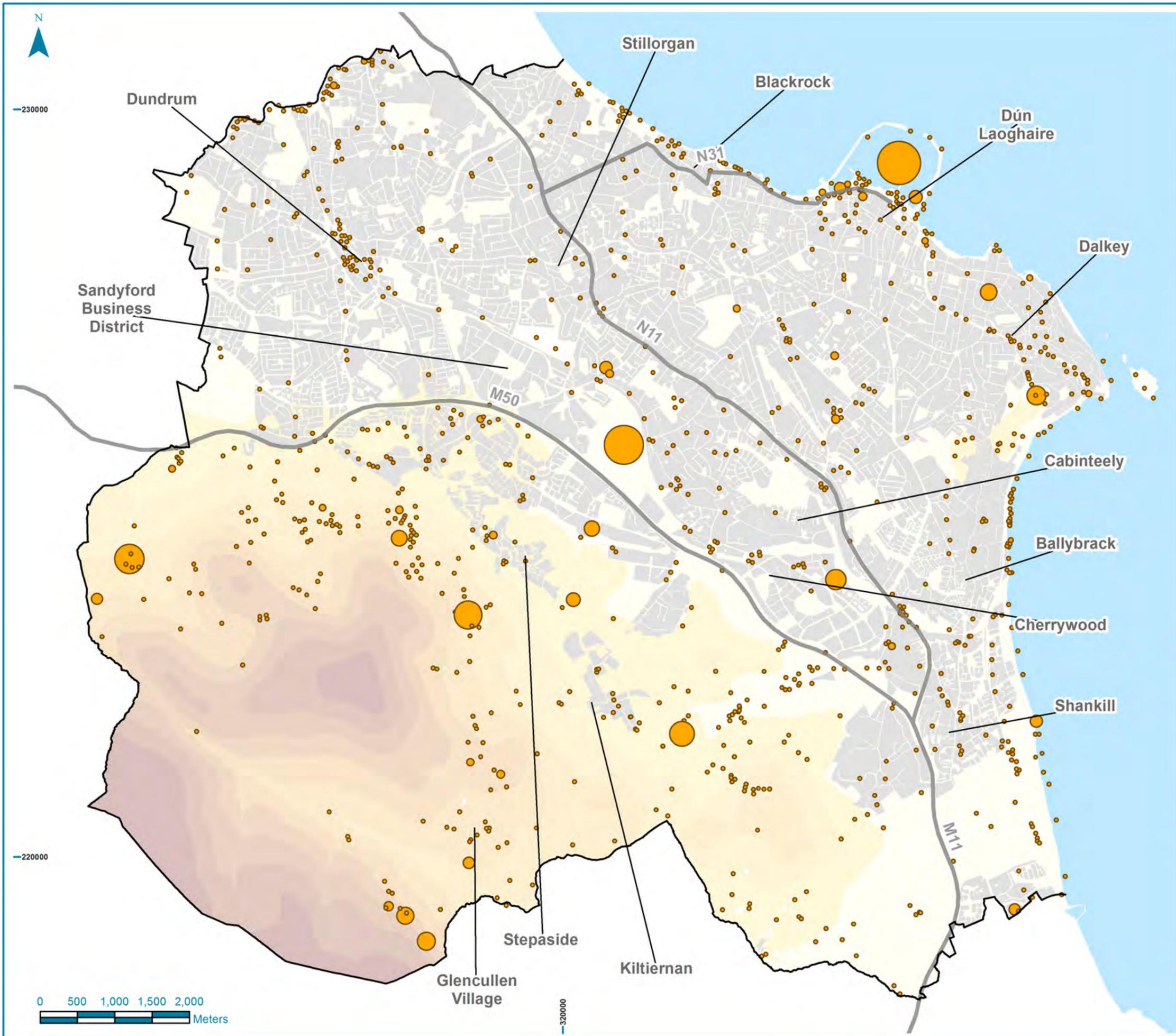
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**Green Infrastructure Strategy**  
**A7 Local Area Plans**

Drawn by: Tom Sampson	Date: 02/12/2014	Scale: 1:50,000
Checked by: Tom Sampson	Date: 02/12/2014	Original @ A3
Approved by: Deidre McDonnell	Date: 02/12/2014	
File Name: 2014s0960_030_05 - A7 Local Area Plans		
Status: Final Map		



- Legend**
- County Boundary
  - Main roads
  - Built up areas
  - Industrial Heritage Sites

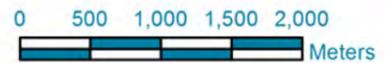
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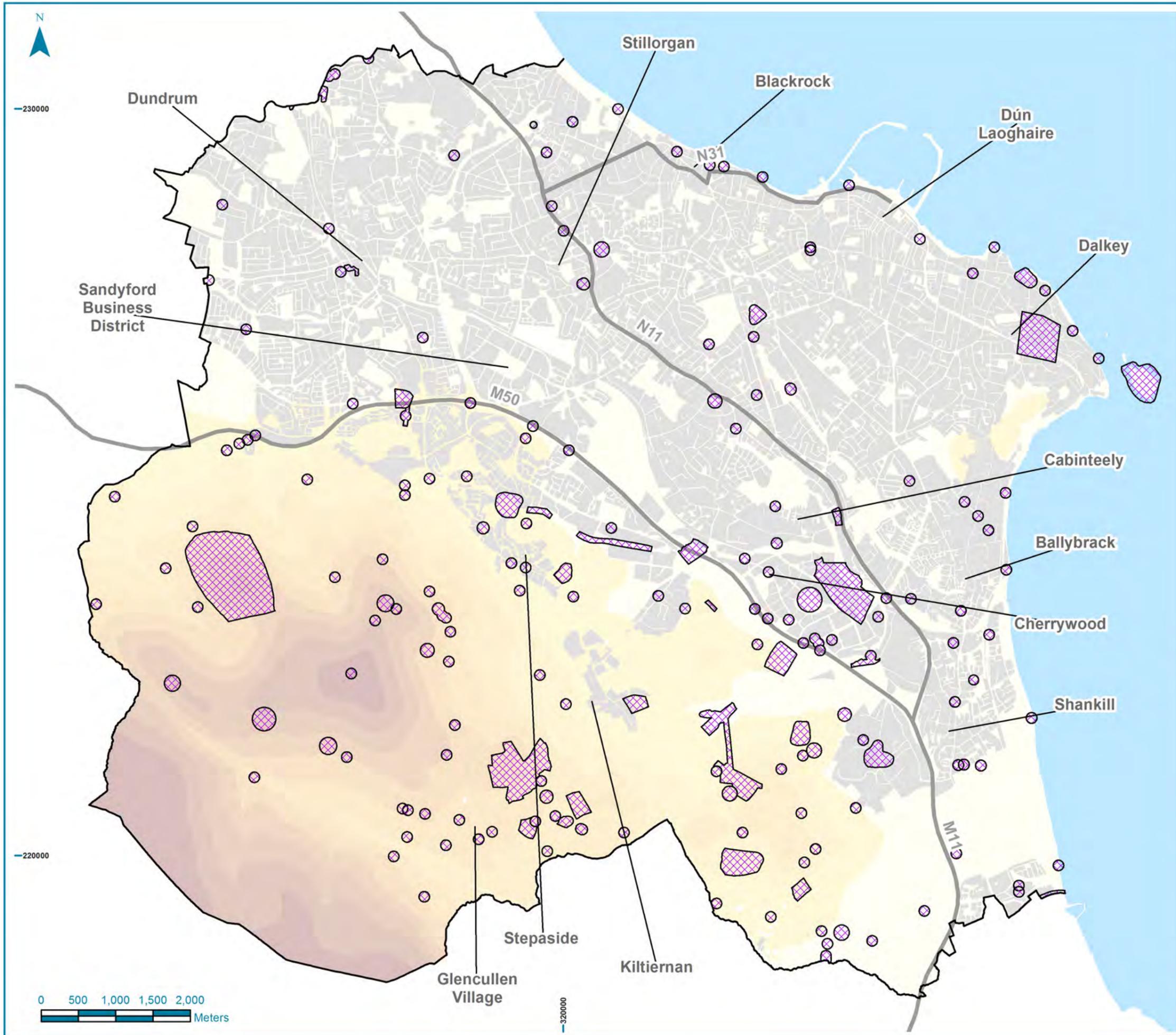
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A8 Industrial Heritage**

Drawn by: Tom Sampson	Date: 02/12/2014	Scale:	
Checked by: Tom Sampson	Date: 02/12/2014		<b>1:50,000</b>
Approved by: Deidre McDonnell	Date: 02/12/2014		Original @ A3
File Name: 2014s0960_045_05 - A8 Industrial Heritage			
Status: Final Map			





- Legend**
- County
  - Main roads
  - Built up areas
  - Recorded Monuments and Places

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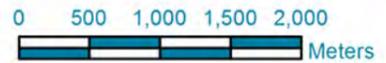
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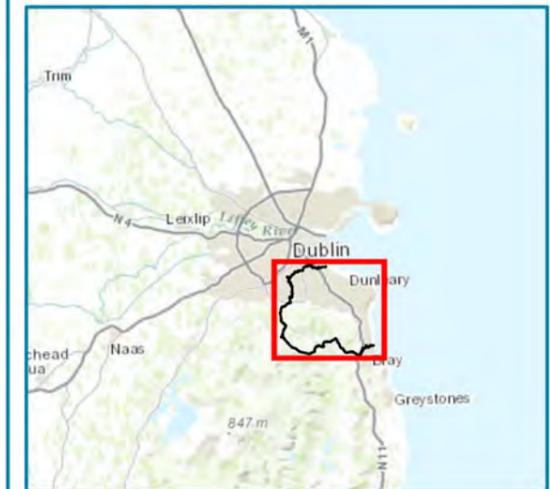
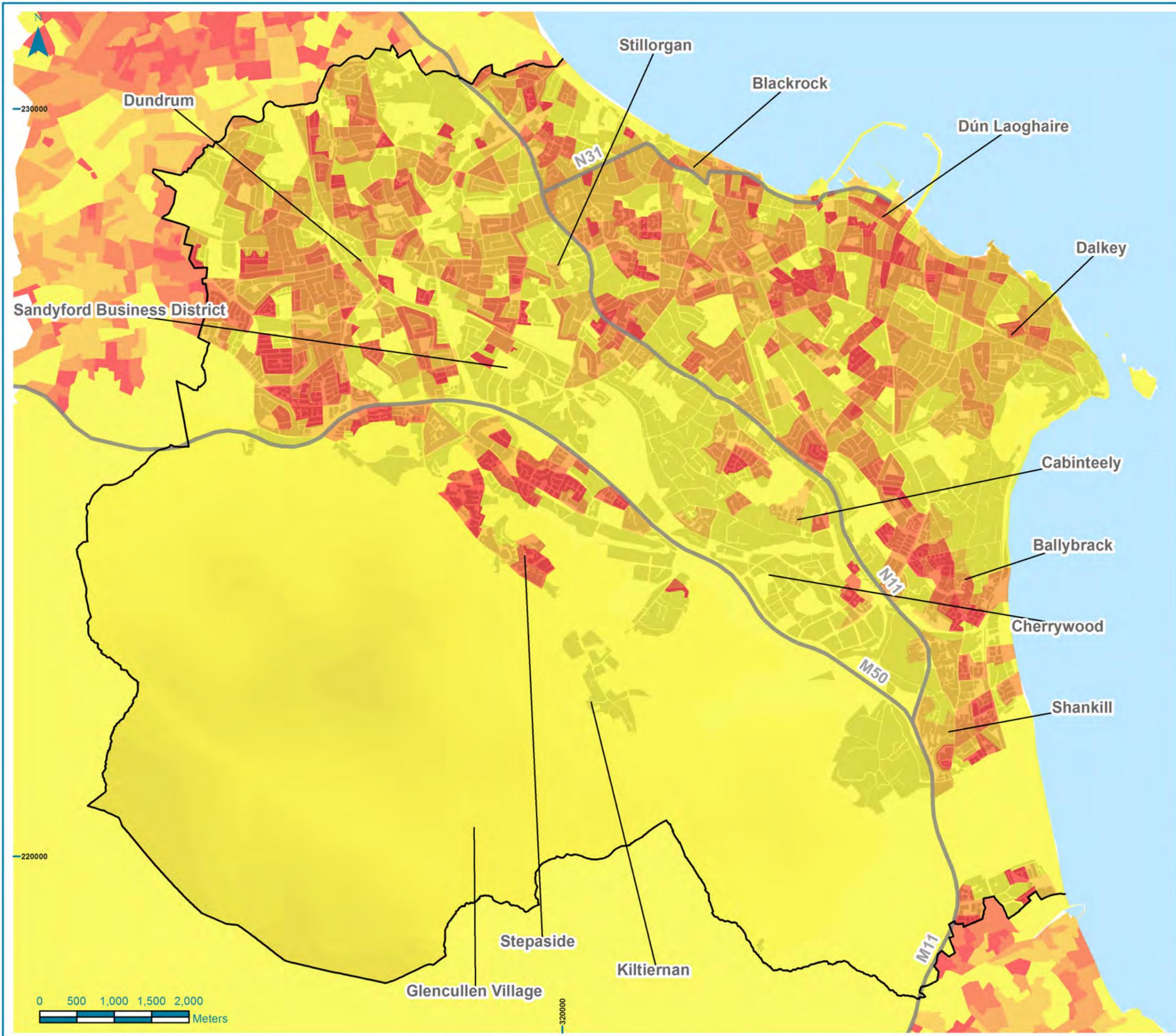
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**A9 Protected Monuments and Places**

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Checked by: Tom Sampson	Date: 02/12/2014	Original @ A3
Approved by: Deidre McDonnell	Date: 02/12/2014	
File Name: 2014s0960_028_07 - A9 Protected Monuments		
Status: Final Map		





**Legend**

- County Boundary
- Main roads
- Built up areas

**2011 Census Small Area Statistics**

**Population Density**

- Low
- High

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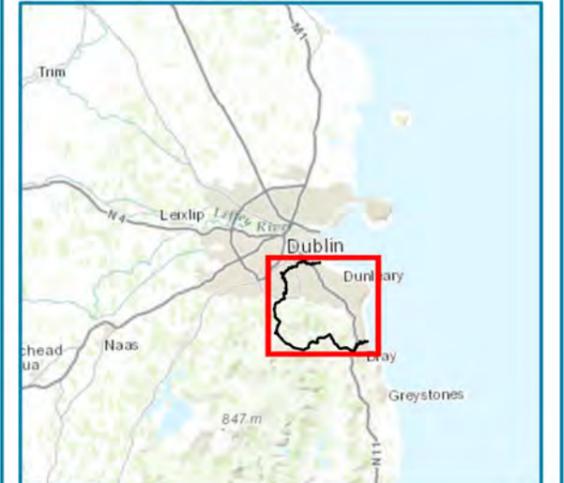
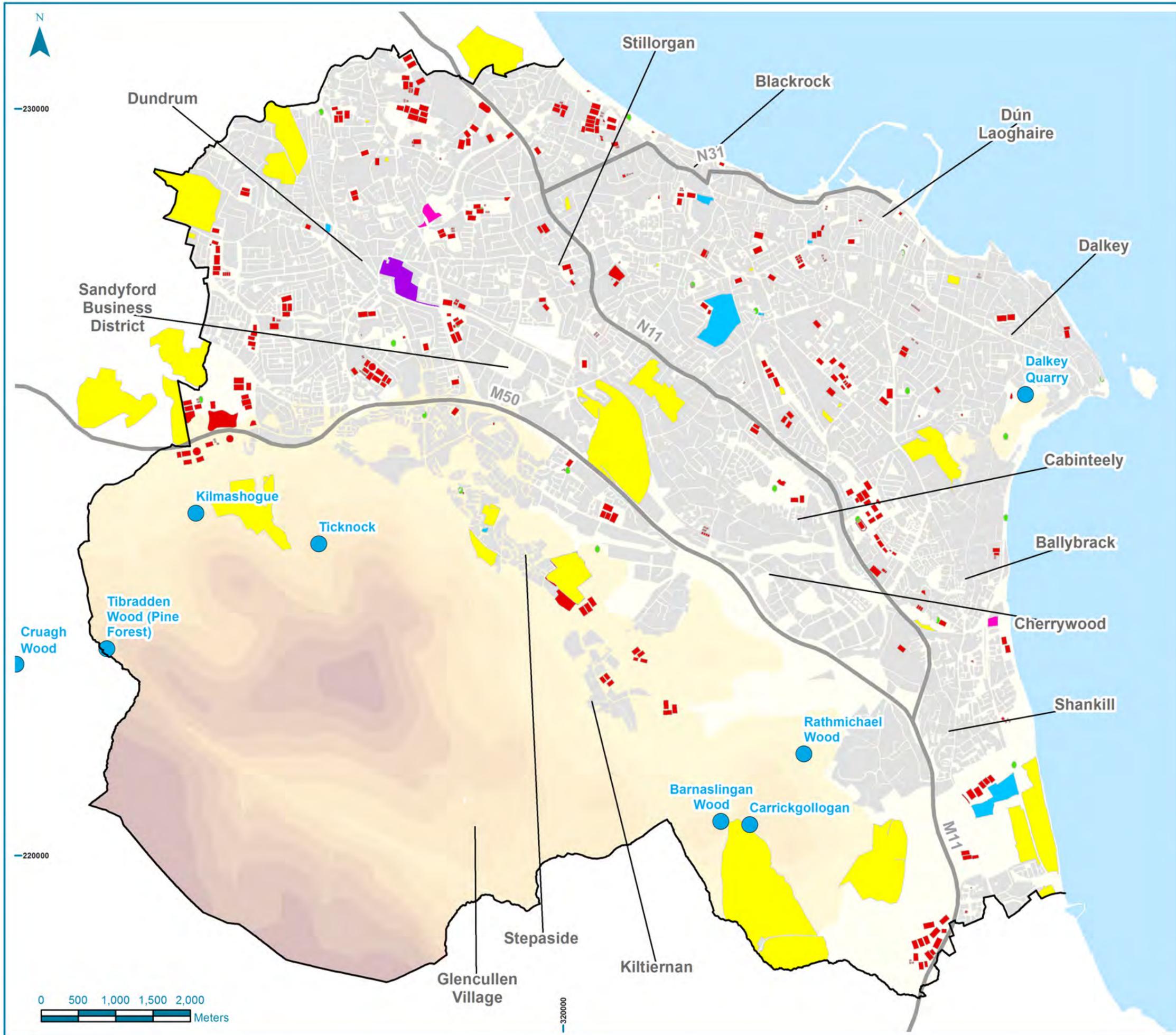
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**A10 Population Density**

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Checked by: Tom Sampson	Date: 02/12/2014	Original @ A3
Approved by: Deidre McDonnell	Date: 02/12/2014	
File Name: 2014s0960_041_05 - A10 Population Density		
Status: Final Map		



- Legend**
- County Boundary
  - Main roads
  - Recreation activity centres
  - Allotment, community garden or urban farm
  - Cemeteries and Burial Grounds
  - Heritage Park and Gardens
  - Outdoor Sports Facility
  - Sports Pitches and Playgrounds
  - Built up areas
  - Dog Walking

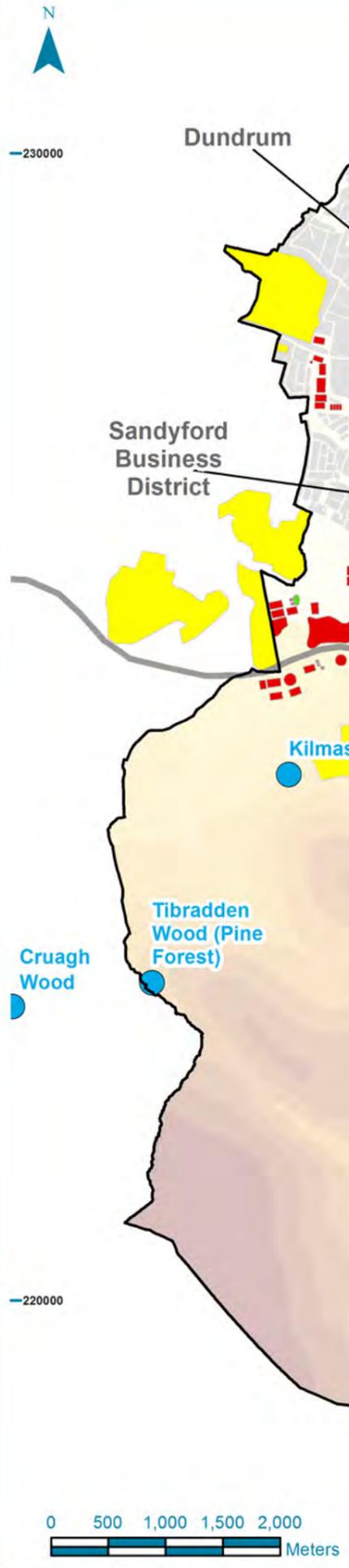
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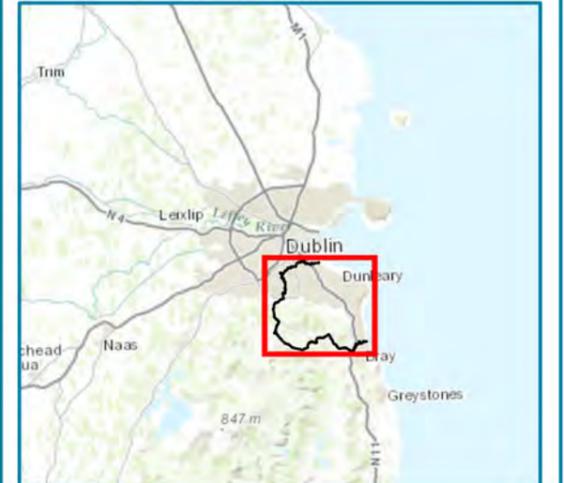
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A11 Recreation Activities**

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Checked by: Tom Sampson	Date: 02/12/2014	<b>1:50,000</b>	Original @ A3
Approved by: Deidre McDonnell	Date: 02/12/2014		
File Name: 2014s0960_031_07 - A11 Recreation Activities			
Status: Final Map			





- Legend**
- County Boundary
  - Main roads
  - Built up areas
- Cycle Network**
- Orbital Cycle Route
  - Radial Cycle Route

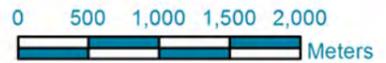
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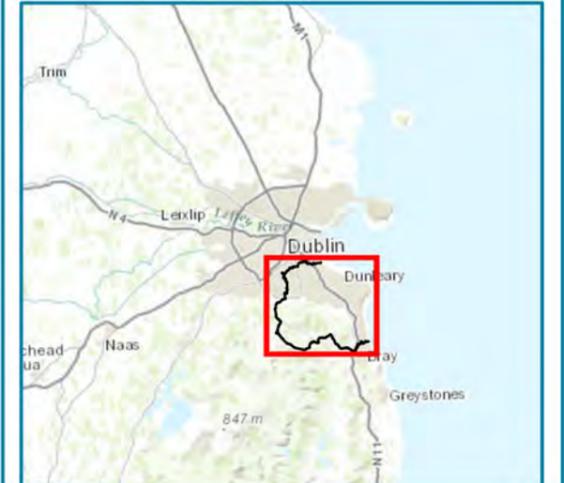
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**A12 Radial and Orbital Cycle Routes**

Drawn by: Tom Sampson	Date: 02/12/2014	Scale:	
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Approved by: Deidre McDonnell	Date: 02/12/2014		
File Name: 2014s0960_057_03 - A12 Radial and Orbital Cycle Routes		Status: Final Map	





- Legend**
- County Boundary
  - Main roads
  - Built up areas
- Cycle Network**
- Link Cycle Route
  - Off Road Cycle Route

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**A13 Link and Off Road Cycle Routes**

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Checked by: Tom Sampson	Date: 02/12/2014	<b>1:50,000</b>	Original @ A3
Approved by: Deidre McDonnell	Date: 02/12/2014		
File Name: 2014s0960_058_03 - A13 Link and Off Road Cycle Routes			
Status: Final Map			

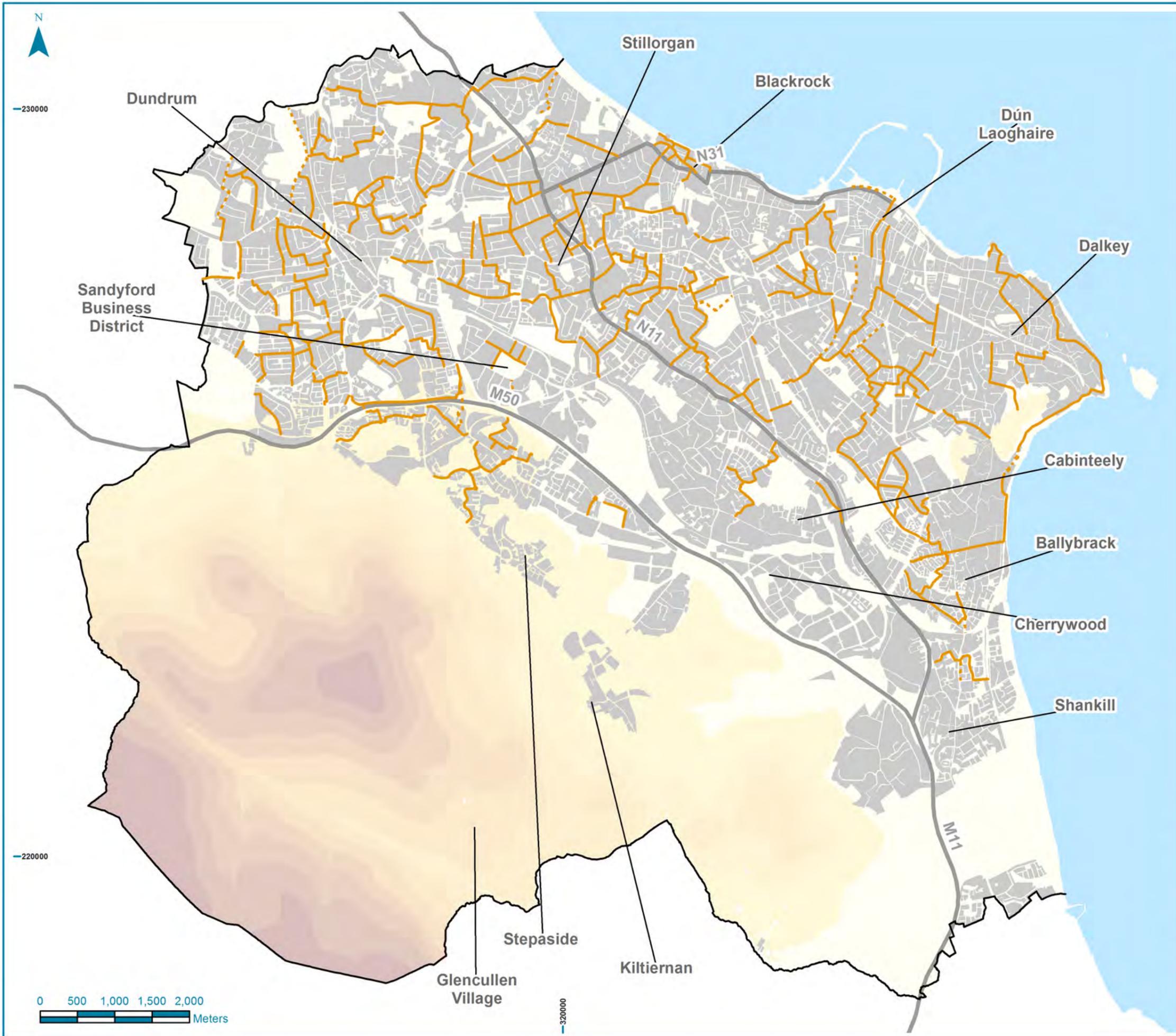
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- Legend**
- County Boundary
  - Main roads
  - Built up areas
  - Proposed low traffic
  - Existing low traffic
- Low Traffic Cycle Network**

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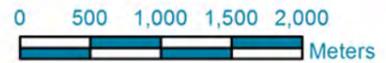
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**A14 Low Traffic (Orange) Existing and Proposed Cycle Network**

Drawn by: Tom Sampson	Date: 02/12/2014	Scale: 1:50,000
Checked by: Tom Sampson	Date: 02/12/2014	Original @ A3
Approved by: Deidre McDonnell	Date: 02/12/2014	
File Name: 2014s0960_065_03 - A14 Orange Cycle Network - existing and proposed		
Status: Final Map		





- Legend**
- County Boundary
  - Main roads
  - Built up areas
  - Busy Traffic Cycle Network

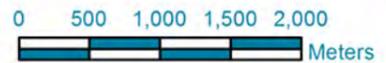
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**A15 Busy Traffic (Red) Existing and Proposed Cycle Network**

Drawn by: Tom Sampson	Date: 02/12/2014	Scale: 1:50,000
Checked by: Tom Sampson	Date: 02/12/2014	Original @ A3
Approved by: Deidre McDonnell	Date: 02/12/2014	
File Name: 2014s0960_066_03 - A15 Busy Traffic Cycle Network - existing and proposed		
Status: Final Map		





**Legend**

- County Boundary
- Main roads
- Built up areas

**Off Road Cycle and Pedestrian Network**

- Proposed off road
- Existing off road

**Low Traffic Cycle Network**

- Proposed low traffic
- Existing low traffic

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**A16 Existing and Proposed Off Road and Low Traffic Cycle Network**

Drawn by: Tom Sampson	Date: 02/12/2014	Scale: 1:50,000
Checked by: Tom Sampson	Date: 02/12/2014	Original @ A3
Approved by: Deidre McDonnell	Date: 02/12/2014	
File Name: 2014s0960_067_03 - A16 Existing and Proposed Off Road and Low Traffic		
Status: Final Map		

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## APPENDIX B Analysis Maps

For these maps the following categorisation was used:

### Open space and public open space

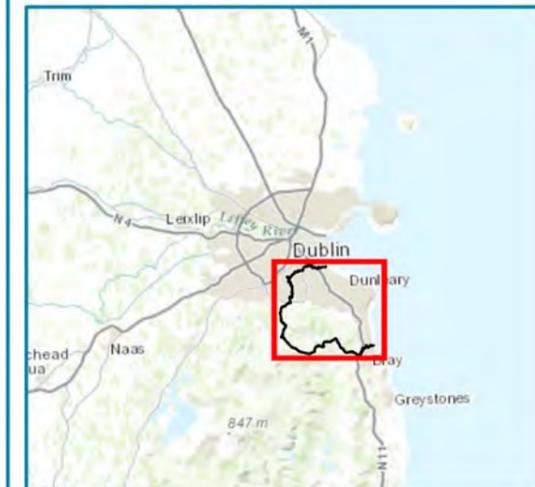
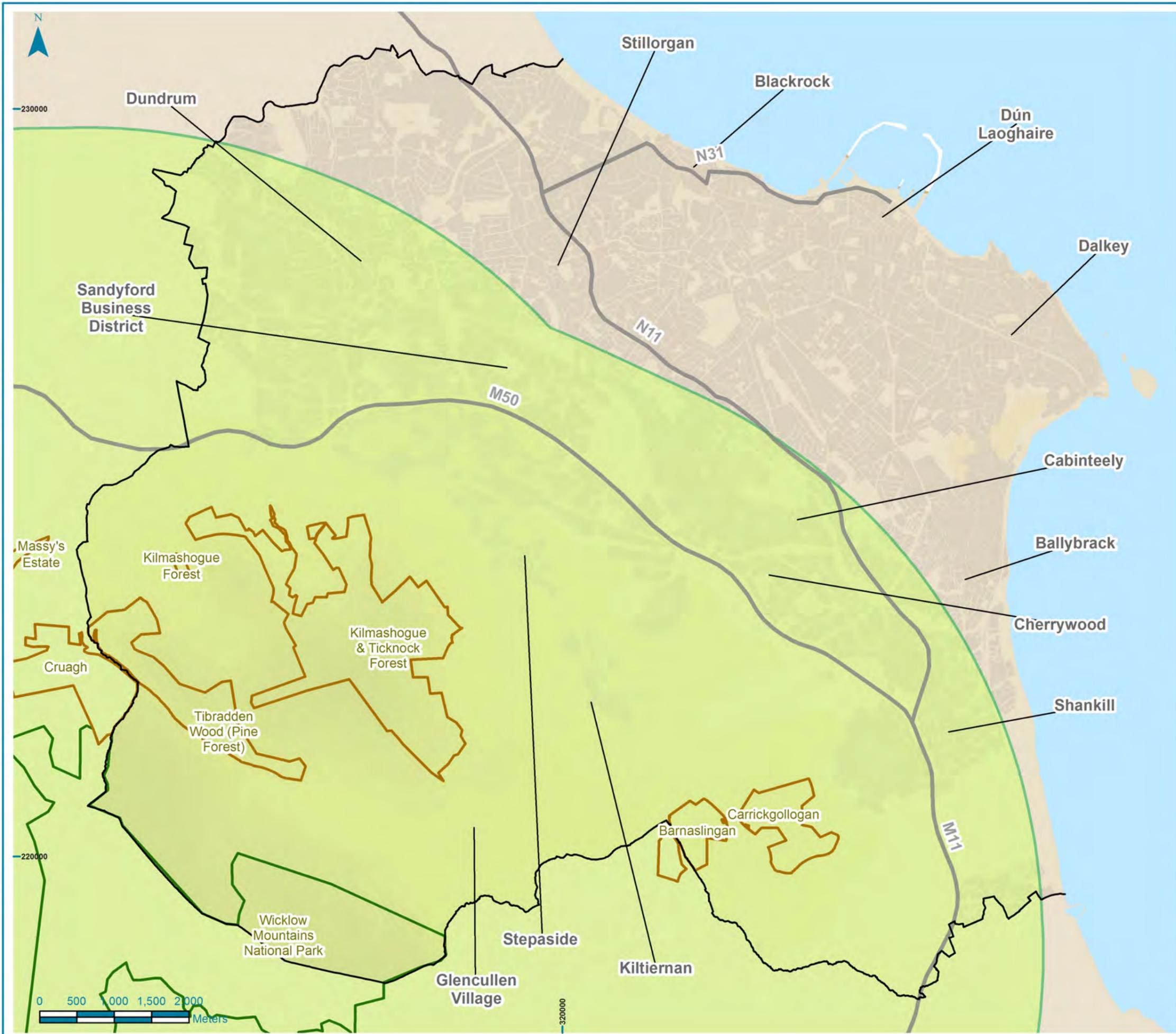
Public open space has been identified as land which is freely open to the public, irrelevant of whether the land is in public or private ownership. This includes public parks, National Park, Coillte land and coastal habitat. Excluded from the classification of public open space is institutional land where there may be restrictions on access, outdoor sports facilities, agriculture, woodland (except Coillte land open to the public) and moorland/scrubland (except for the National Park).

### Proximity to open space and public open space

The East London Green Grid uses the following target distances to different parks which has been applied to the Dún Laoghaire-Rathdown spatial analysis. There are no prescriptive buffer distances set in any Ireland, UK or Scotland Green Infrastructure or open space guidelines and this hierarchy fits the Dún Laoghaire-Rathdown parks and gardens classification and continues the 400m buffer distance used in the open space strategy.

East London Green Grid Park Typology (usual size in hectares)	Dún Laoghaire-Rathdown equivalent Park Typology	Recommended maximum distance to parks
Regional Park (400ha)	Wicklow Mountains National Park and Open Access Coillte Land	3.2<8km
Metropolitan Park (60ha)	Regional Parks	3.2km
District Park (20ha)	District Park (also allotments and urban farms)	1.2km
Local Park (2ha)	Local Park	400m
Small Open Space (<2ha)	Amenity Open Spaces	<400m
Pocket Park (<0.4ha)	Amenity Open Spaces	<400m
Linear Open Space (varies)	Street Trees & Recreational Access Routes, Watercourses and Greenways	Wherever possible

Appendix B, Table A: East London Green Guide. Proximity to Open Space and Public Open Space.



**Legend**

- County Boundary
- Main roads
- Parks and Open Spaces**
- National Park
- Coillte Land
- Within 8km of National Parks
- Within 8km of Coillte Land
- Built up areas

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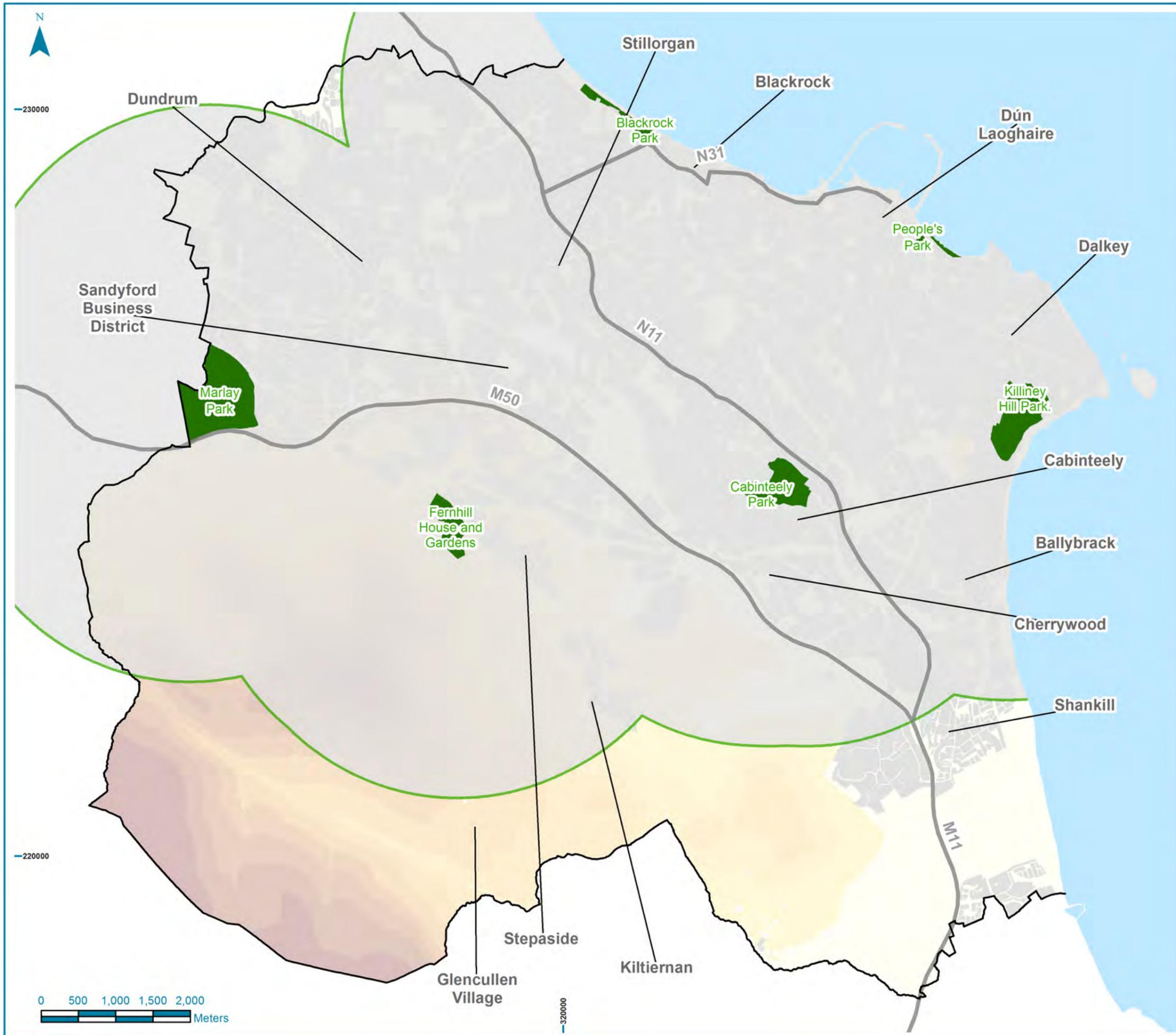
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**B1 Distance to Wicklow Mountains National Park and Coillte Land**

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Checked by: Tom Sampson	Date: 02/12/2014	<b>1:50,000</b>
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File Name: 2014s0960_049_04 - B1 Distance to National Park and Dublin Mountains		
Status: Final Map		



- Legend**
- County Boundary
  - Main roads
  - Parks and Open Spaces**
  - Regional Park
  - Within 3.2km of Existing Regional Parks
  - Built up areas

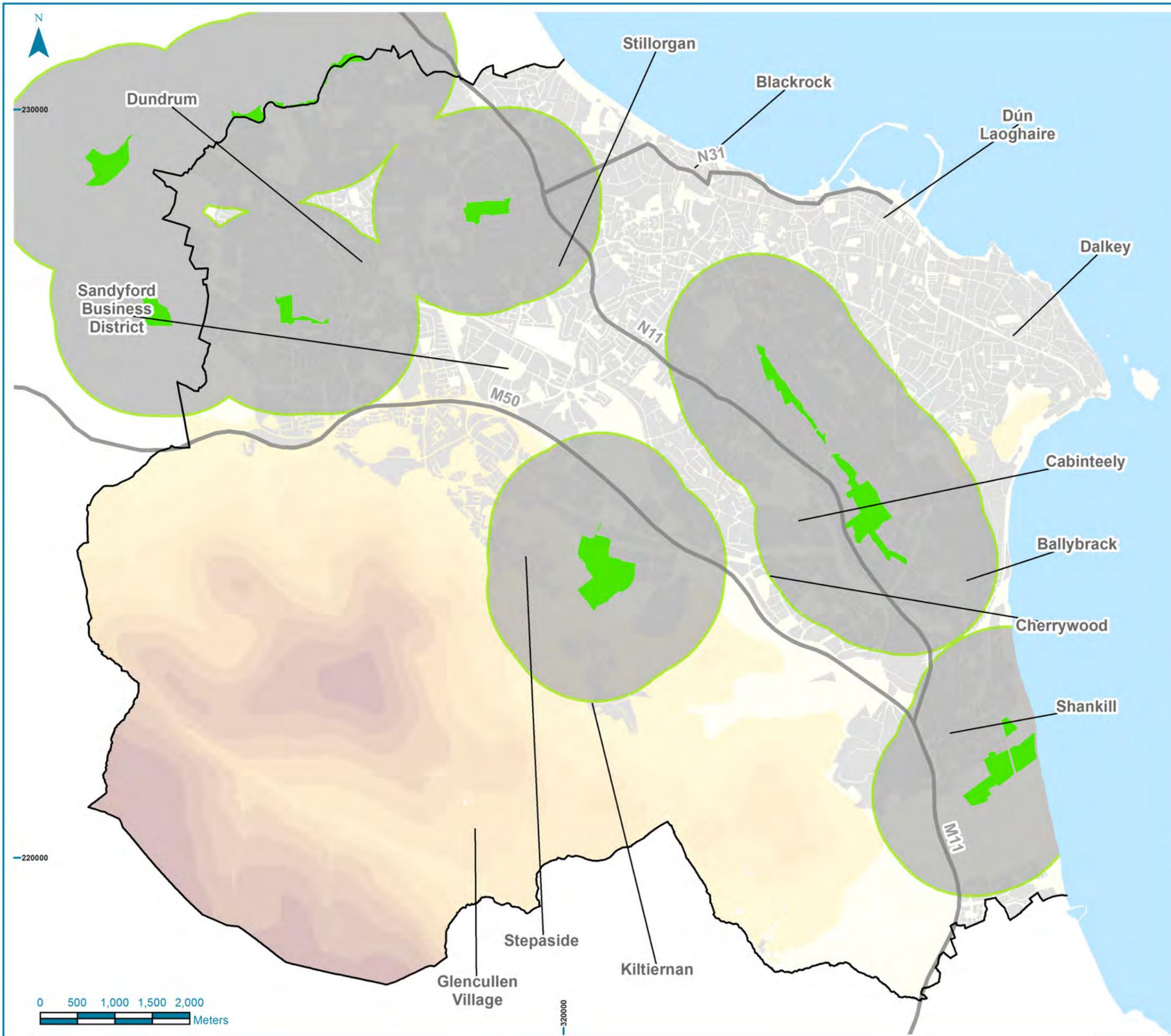
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**B2 Distance to Regional Parks**

Drawn by: Tom Sampson	Date: 24/02/2015	Scale: 1:50,000
Checked by: Tom Sampson	Date: 24/02/2015	Original @ A3
Approved by: Deidre McDonnell	Date: 24/02/2015	
File Name: 2014s0960_050_04 - B2 Distance to Regional Parks		
Status: Final Map		



**Legend**

- County
- Main roads
- Parks and Open**
- District Park
- Within 1.2km of Existing District
- Built up areas

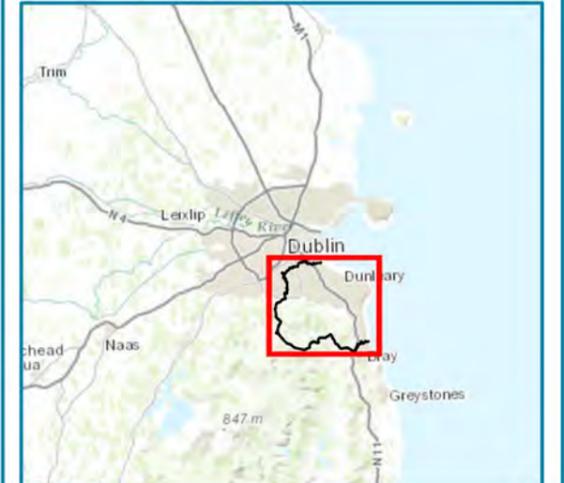
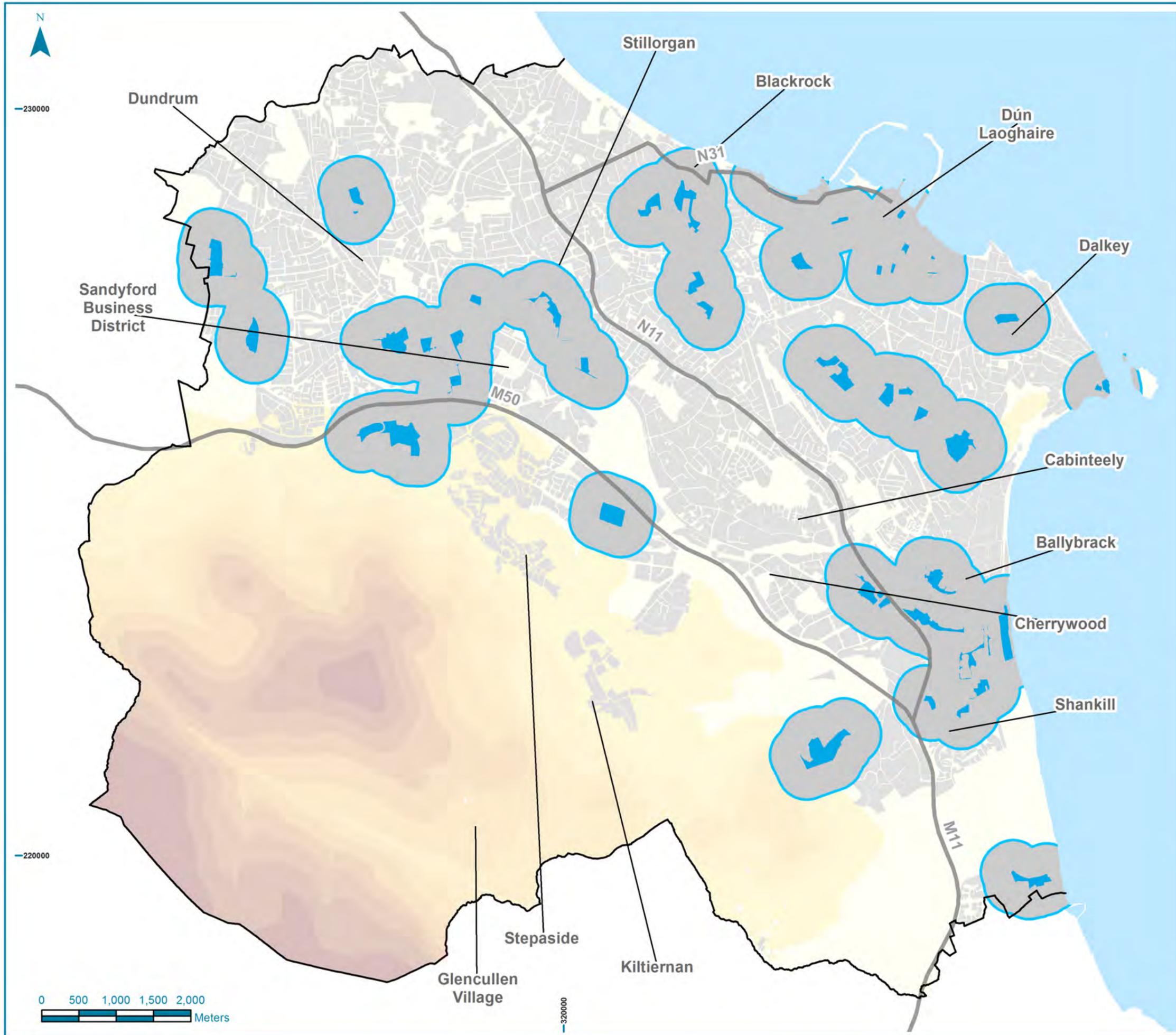
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for  
**Dun Laoghaire Rathdown County  
Council  
Green Infrastructure Strategy  
B3 Distance to District Parks**

Drawn by: Tom Sampson	Date: 02/12/2014	Scale:	
Checked by: Tom Sampson	Date: 02/12/2014	<b>1:50,000</b>	Original @ A3
Approved by: Deidre McDonnell	Date: 02/12/2014		
File Name: 2014s0960_051_03 - B3 Distance to District Parks			
Status: Final Map			



**Legend**

- County
- Main roads

**Parks and Open**

- Local Park
- Within 400m of Existing Local
- Built up areas

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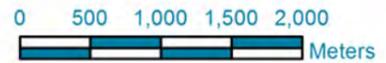
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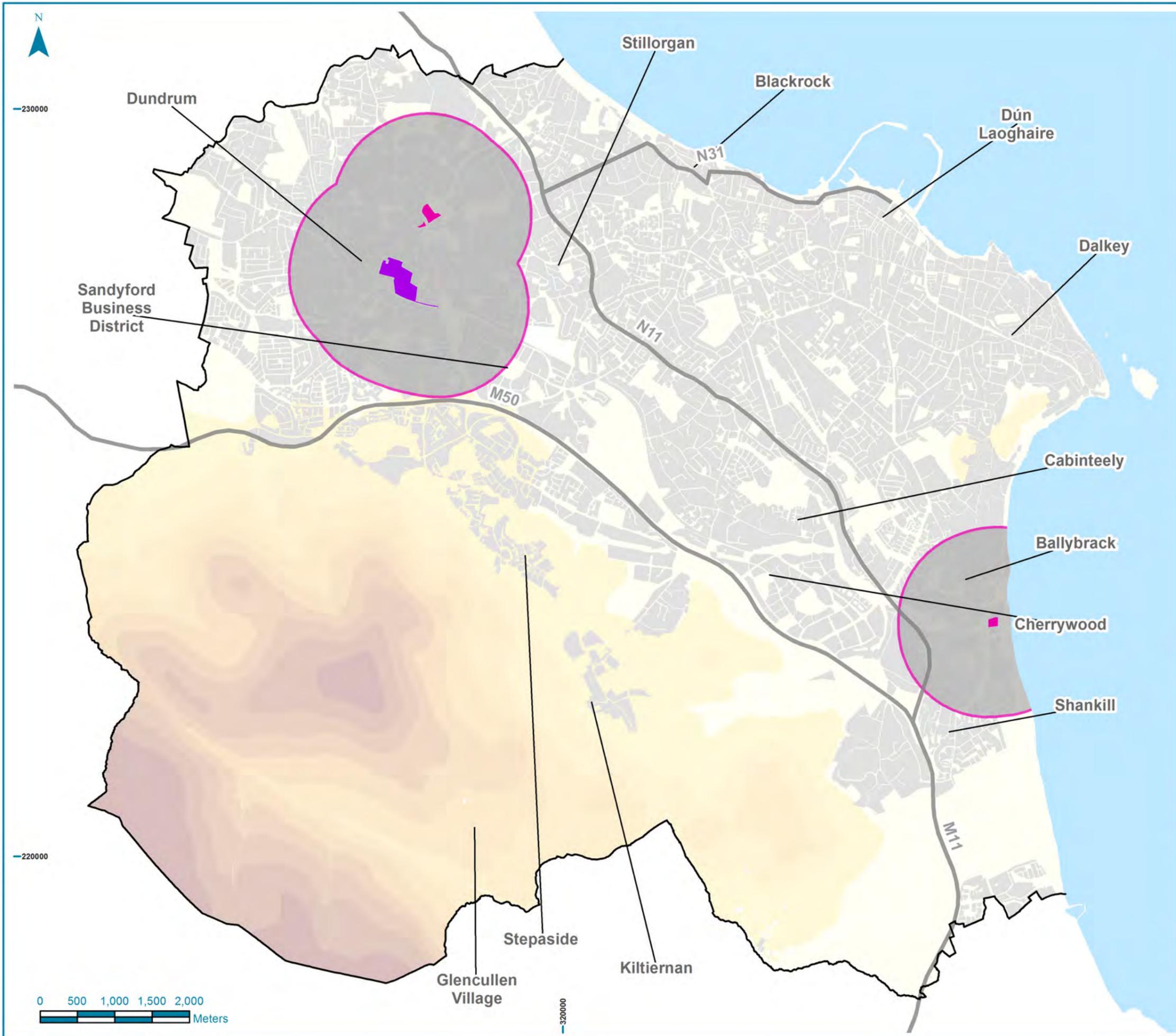
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**Green Infrastructure Strategy**  
**B4 Distance to Local Parks**

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Checked by: Tom Sampson	Date: 02/12/2014	Original @ A3
Approved by: Deidre McDonnell	Date: 02/12/2014	
File Name: 2014s0960_052_04 - B4 Distance to Local Parks		
Status: Final Map		





**Legend**

- County Boundary
- Main roads
- Parks and Open Spaces**
- Allotment, community garden or urban farm
- Heritage Park and Gardens
- Within 1.2km of Existing Allotments, Heritage Parks, Urban Farms and Community Gardens
- Built up areas

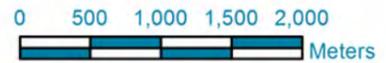
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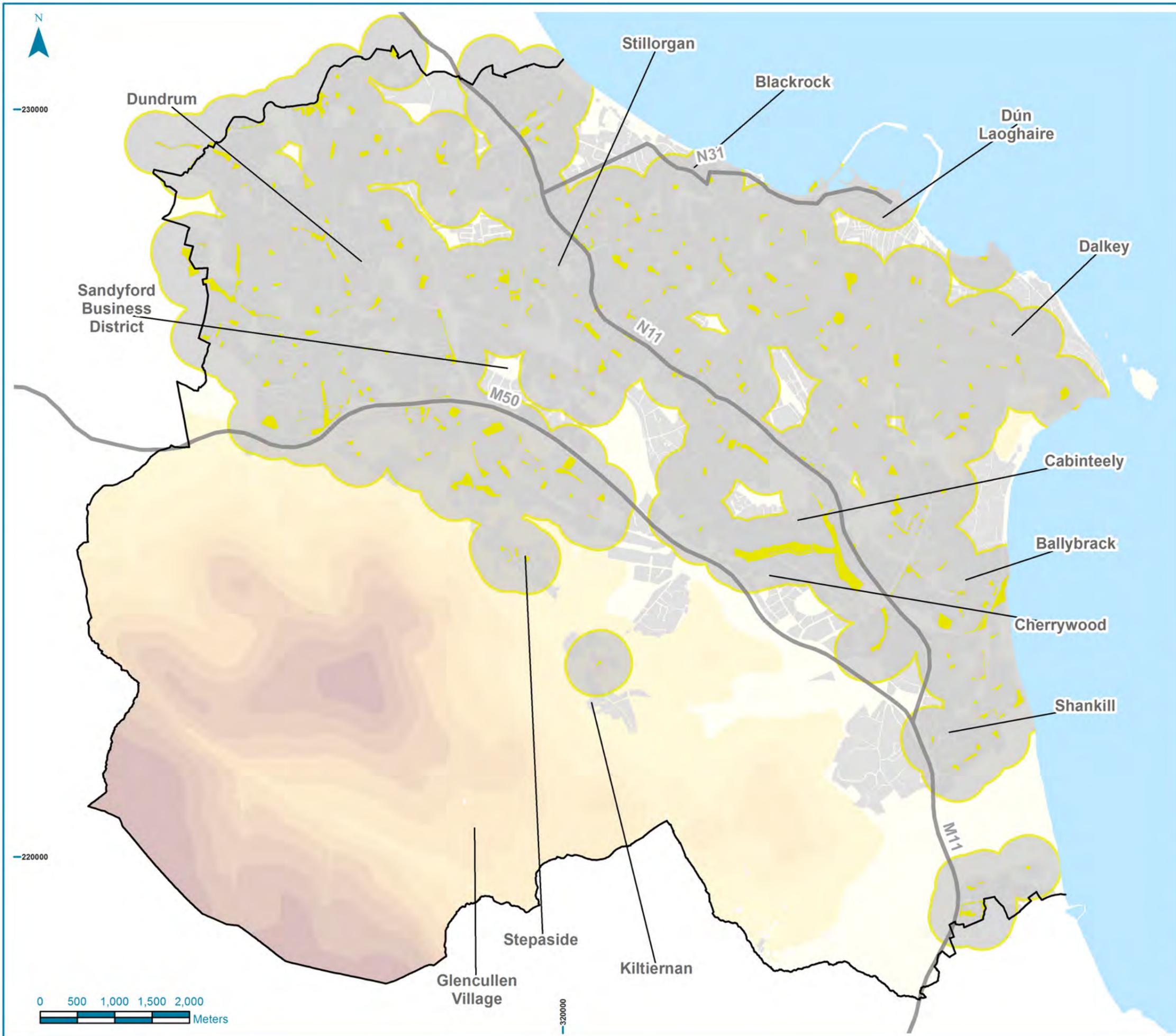
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**B5 Distance to Allotments, Heritage Parks, Urban and Community Gardens**

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Checked by: Tom Sampson	Date: 02/12/2014	Original @ A3
Approved by: Deidre McDonnell	Date: 02/12/2014	
File Name: 2014s0960_052b_04 - B5 Distance to Allotments, Urban Gardens, Herita		
Status: Final Map		





- Legend**
- County
  - Main roads
  - Parks and Open**
  - Amenity Open
  - Within 400m of Existing Amenity Open Space
  - Built up areas

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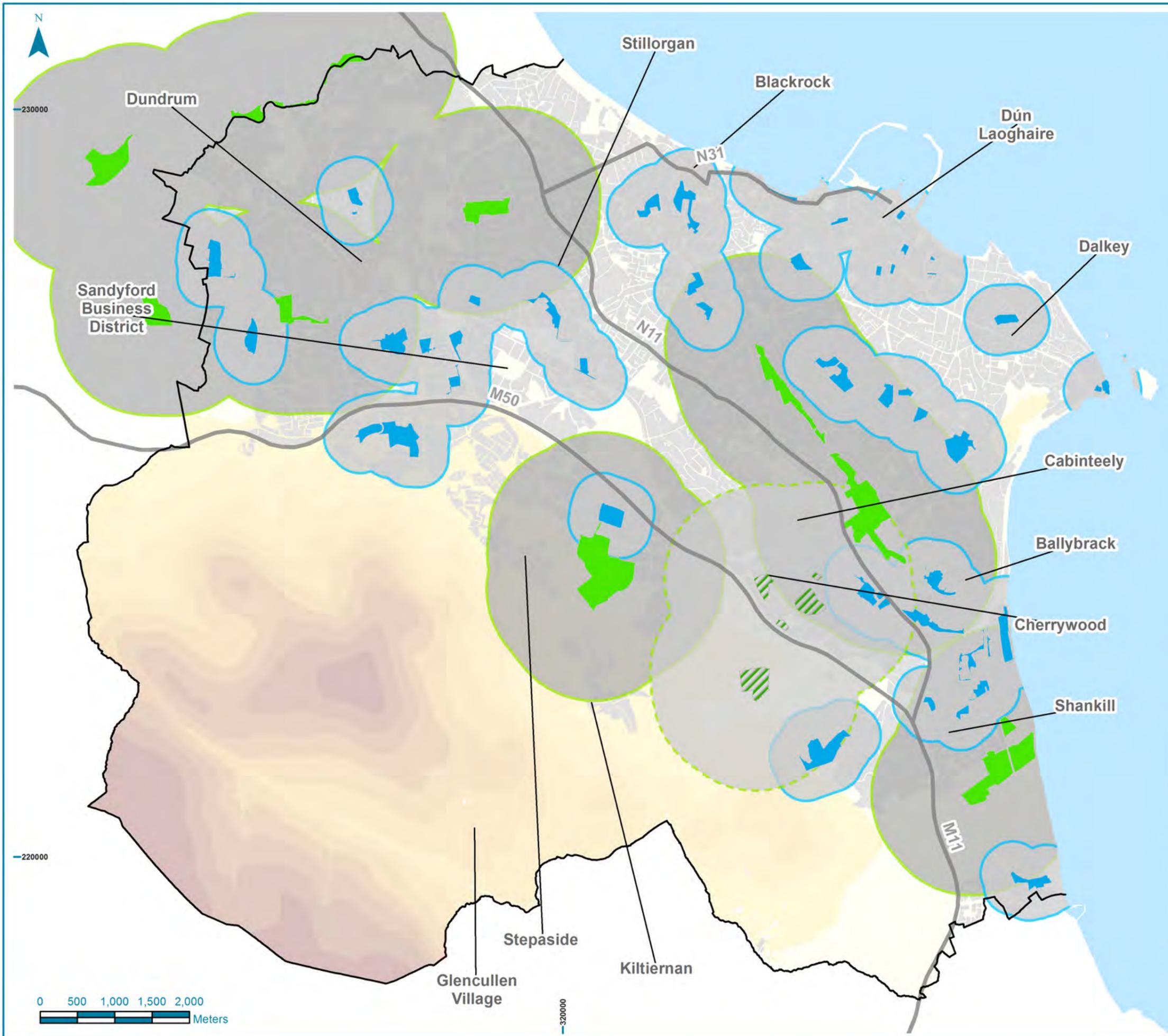
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**B6 Distance to Amenity Open Space**

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Approved by: Deidre McDonnell	Date: 02/12/2014	
File Name: 2014s0960_053_03 - B6 Distance to Amenity Open Space		
Status: Final Map		



**Legend**

- County
- Main roads
- Parks and Open**
- District Park
- Local Park
- ▨ Parks (proposed)
- Within 1.2km of Proposed
- Within 400m of Existing Local
- Within 1.2km of Existing District
- Built up areas

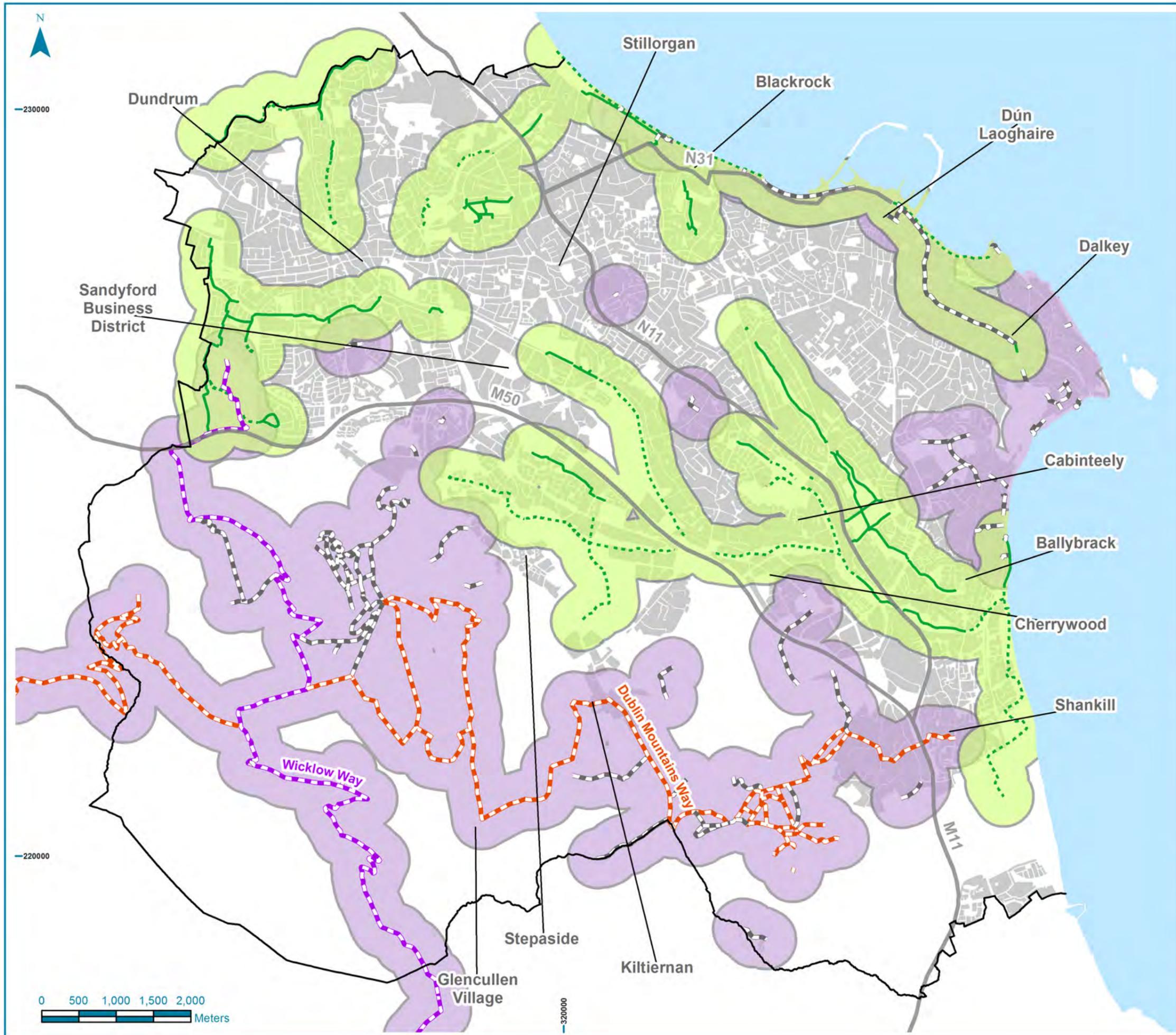
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Green Infrastructure Strategy  
B7 Distance to Proposed Parks**

Drawn by: Tom Sampson	Date: 02/12/2014	Scale:	
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Approved by: Deidre McDonnell	Date: 02/12/2014		Original @ A3
File Name: 2014s0960_054_03 - B7 Distance to Proposed Parks			
Status: Final Map			



- Legend**
- County Boundary
  - Main roads
  - Built up areas
  - Recreation Access
  - Dublin Mountains Way
  - Wicklow Way
- Off Road Cycle and Pedestrian**
- Proposed off road
  - Existing off road
  - Within 400m of an Existing or Proposed Off Road Cycle Network
  - Within 400m of a Recreational Access

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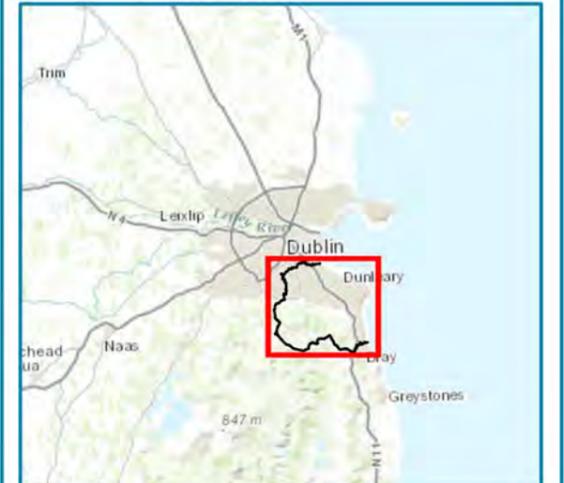
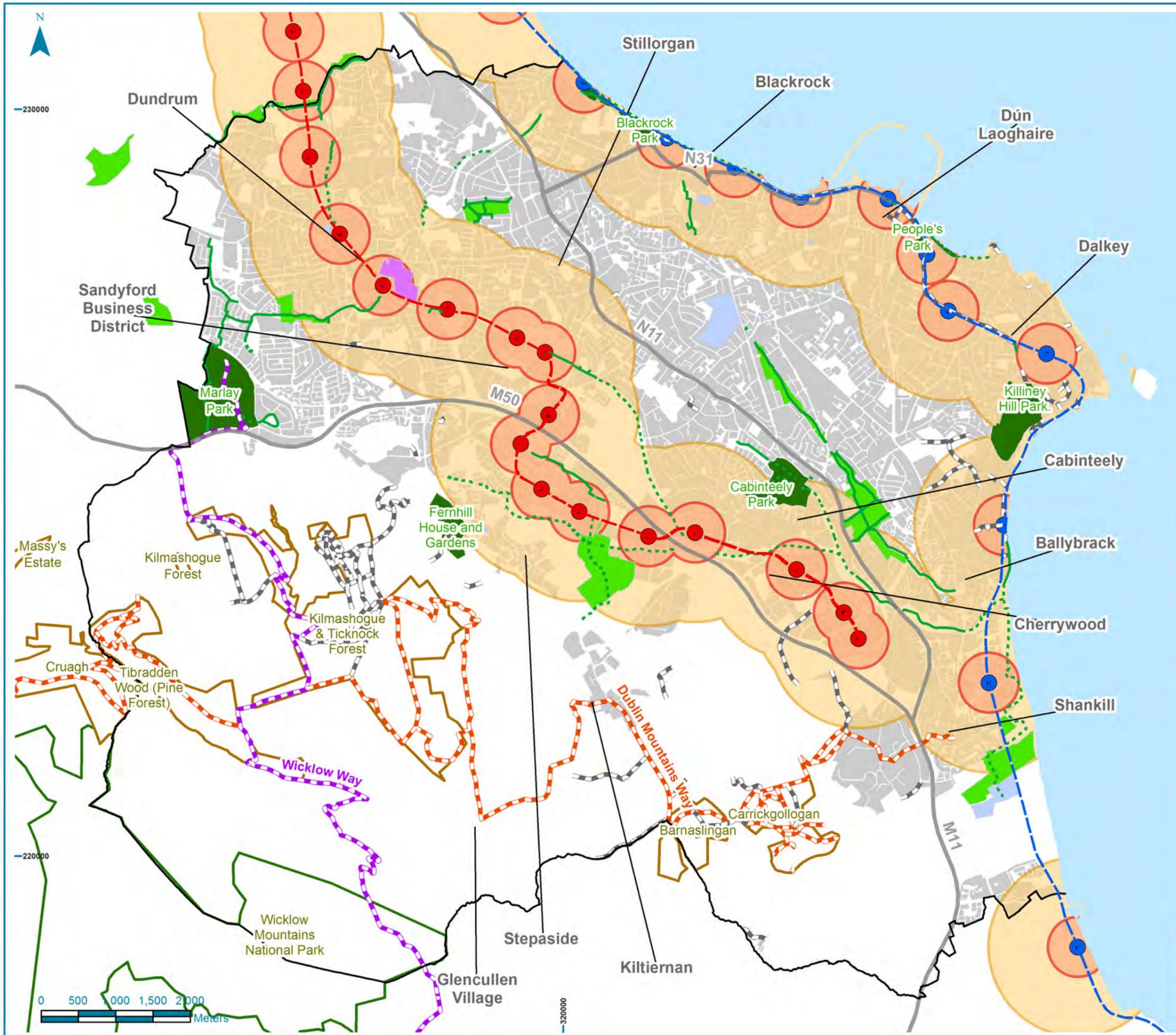
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**Green Infrastructure Strategy**  
**B8 Distance to Existing Greenways and Recreation Access Routes**

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Checked by: Tom Sampson	Date: 02/12/2014	Original @ A3
Approved by: Deidre McDonnell	Date: 02/12/2014	
File Name: 2014s0960_060_03 - B8 Distance to Greenways and Recreation Access		
Status: Final Map		



**Legend**

- County Boundary
- Main roads
- Built up areas
- Recreation Access Routes
- Dublin Mountains Way
- Wicklow Way
- DART stations
- LUAS stops
- DART line
- LUAS line
- Within 400m of DART or LUAS stop
- Within 1.2km of DART or LUAS stop

**Parks and Open Spaces**

- National Park
- Coillte Land
- Regional Park
- District Park
- Heritage Park and Gardens
- Cemeteries and Burial Grounds

**Off Road Cycle and Pedestrian Network**

- Proposed off road
- Existing off road

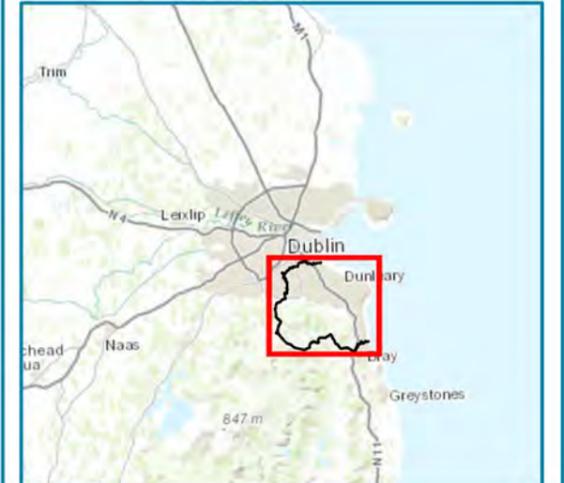
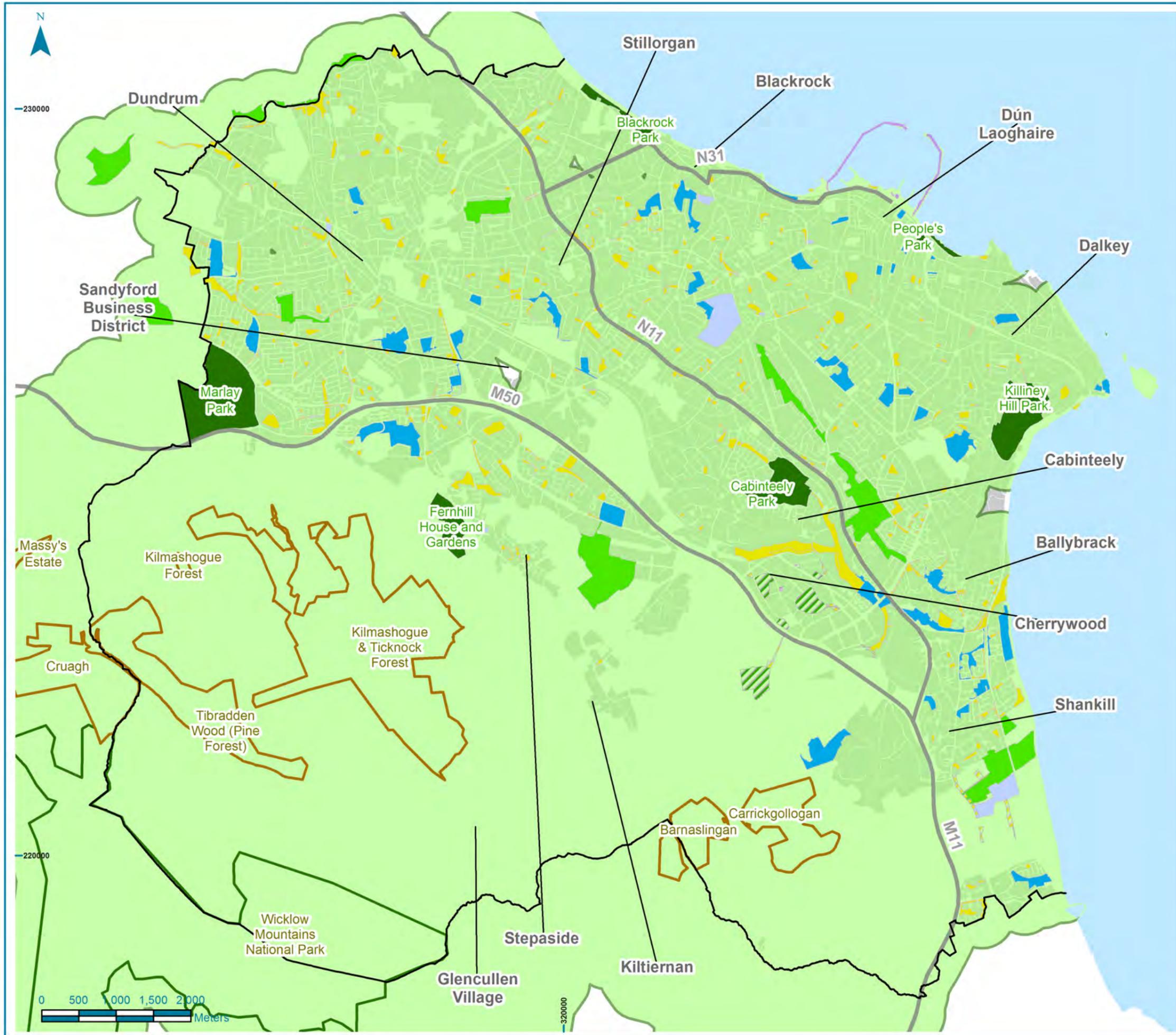
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**B9 Distance to DART and LUAS stops**

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Approved by: Deidre McDonnell	Date: 24/02/2015	Original @ A3
File Name: 2014s0960_061_04 - B9 Distance to DART and LUAS stops		
Status: Final Map		



**Legend**

- County Boundary
- Main roads
- Built up areas
- Within 400m of all Public Parks

**Parks and Open Spaces**

- National Park
- Coillte Land
- Regional Park
- District Park
- Local Park
- ▨ Parks (proposed)
- Amenity Open Space
- ▨ Amenity Open Space (proposed)
- Civic Space
- ▨ Civic Space (proposed)
- Cemeteries and Burial Grounds

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**B10 Distance to All Public Parks**

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File Name: 2014s0960_063_04 - B10 Distance to All Public Parks		
Status: Final Map		

## APPENDIX C Green Infrastructure Toolkits

### Checklist for Integrating Green Infrastructure into Planning Policy and Development Masterplans

This checklist of key Green Infrastructure planning, design and management considerations is intended to help ensure that the multifunctional benefits of Green Infrastructure are reflected in all relevant development proposals that can make a contribution to the delivery of the Green Infrastructure Network in the Development Plan/Local Area Plan.

**Appendix C, Table A: Checklist for Integrating Green Infrastructure into Planning Policy and Development Masterplans**

Where relevant does the development proposal:	Yes/No	Comment
<b>General</b>		
Consider the objectives for Green Infrastructure in the Development Plan?		
Relate to a site with a significant existing Green Infrastructure functions?		
Relate to a site of strategic or local Green Infrastructure importance?		
Balance any potential loss of Green Infrastructure with the provision of new Green Infrastructure?		
Contain sufficiently detailed designed proposals to assess the Green Infrastructure merits of the development?		
<b>Accessibility, Recreation, Health and Well-being</b>		
Recognise and define the local landscape character?		
Guide the process of planning, designing and managing green space provision?		
Inform the management of green spaces as an integral part of the form and design of new built development?		
Input into master planning to guide and shape development at a more localised level?		
Consider the restoration of disused sites that are not suitable for development or have nature conservation or historic interest that should be conserved and properly managed?		
Consider the use of locally distinctive materials and techniques?		
Inform the general objective of the visual containment of urban development by local topography and/or screening by existing and new areas of substantial tree cover?		
Safeguard existing formal and informal sport and recreation facilities, including allotments from development where they meet local needs?		
Reflect opportunities to create new recreational facilities, particularly those that will link urban, rural and coastal areas?		
Recognise the importance of linked up green space and green routes for providing recreational opportunities that can enhance health and well-being?		
Improve local environments and contribute to sustainable development through providing new woodlands to improve air quality, reduce noise and light pollution.		

Natural and Cultural Heritage		
Ensure that new development avoids damage to existing designated sites and seeks to enhance them where possible?		
Ensure that development and implementation results in a net gain of habitats to maintain and enhance the biodiversity of Dún Laoghaire-Rathdown?		
Seek to halt and reverse habitat fragmentation and species isolation of existing biodiversity assets by buffering existing sites and creating new wildlife corridors between them?		
Identify areas for habitat restoration?		
Improve and maintain the connectivity of open space, wildlife sites and habitats as a network of corridors by maintaining, enhancing and, where appropriate restoring important ecological links for the dispersal of wildlife with existing habitats, and linking new created habitats where appropriate?		
Base the planning and design of development proposals on up-to-date ecological surveys where such information does not exist?		
Encourage the planting of appropriate vegetation to link with and extend adjacent semi-natural woodland, scrub and grassland by reflecting species' composition to provide linear corridors linking isolated habitats?		
Encourage positive management of semi-natural or artificial habitats such as woodlands, grasslands, scrub and quarries, giving consideration to the reintroduction of traditional management regimes such as coppicing, pollarding or flood meadow habitat management?		
Encourage restoration of semi-natural habitats?		
Reduce conflicts between recreation and nature conservation by restrictions on public access where it would be detrimental to wildlife?		
Consider replacement planting programmes for mature trees?		
Incorporate habitats for urban wildlife into new and existing buildings such as green roofs?		
Contribute to the protection and enhancement of the historic and cultural dimension of the landscape, including particular historic assets and their settings?		
Ensure that all new development avoids damage to protected areas, sites and features and enhances them where possible?		
Promote new opportunities for access to historic sites?		
Promote opportunities for the repair, restoration and/or re-creation of historic landscapes, especially where they also restore or recreate wildlife habitats?		
Promote the repair, restoration and management of urban parks, historic parks and gardens, and other historic landscapes, where they provide opportunities for access to the wider countryside and other historic sites and features?		
Take account of historic townscape character and cultural heritage assets?		
Give particular attention to the significance and management requirements of historic buildings, sites and structures, and historic landscape features and elements?		
Protect important views and vistas of historic landmarks and their settings from inappropriate landscape change or intrusion by new developments and related infrastructure?		
Encourage the appropriate re-use and renovation of neglected historic buildings and structures where this would ensure the perpetuation of these buildings as attractive and distinctive features?		
Encourage research to promote the historical and cultural associative value and interest of historic landscapes?		
Protect historic buildings and structures from redevelopment or inappropriate changes of use?		
Consider the historical use of rivers, improving where appropriate opportunities for access to and along the river corridors?		

Water Resources		
Incorporate Sustainable Drainage Systems (SuDS) into its design in the private and public realm?		
Promote creative enhancement of watercourses as features for recreation and biodiversity?		
Use more natural methods of protecting water quality and providing stormwater attenuation where possible e.g. swales and wetlands as opposed to underground storage tanks.		
Consider impact of climate change on the development, and of the climate change impact of the development.		

## Green Streets Stormwater Design Toolkit

This toolkit can inform design strategies in the masterplanning process for green streets. Reductions in the impermeable area should be identified first before moving onto stormwater attenuation and so on, with underground attenuation being the last resort. The design strategy should seek to provide measures which are as multi-functional as possible, underground storage providing limited multi-functional benefits.

Design Strategy	Possible Measures
Reduce impermeable area	<ul style="list-style-type: none"> <li>• Landscaping around footpaths and cycle ways, such as pocket parks</li> <li>• Permeable paving to footpaths and cycle ways</li> <li>• Moveable planters on footpaths and cycle ways</li> <li>• Green roofs to buildings draining to street</li> <li>• Permeable paving on the street</li> <li>• Green track technology for tram and railways</li> </ul>
Stormwater attenuation and storage	<ul style="list-style-type: none"> <li>• Stormwater kerb extensions and planters</li> <li>• Green gutters along tram lines and railways</li> </ul>
Above ground attenuation and storage	<ul style="list-style-type: none"> <li>• Stormwater canopies and Green roofs at transport stops and intersections</li> <li>• Street tree canopies for stormwater interception</li> </ul>
Underground attenuation and storage	<ul style="list-style-type: none"> <li>• Infiltration zones</li> </ul>

Appendix C, Table B: Green Streets Stormwater Design Toolkit.





