Section 4 Environmental Baseline

4.1 Introduction

The SEA Directive requires that the information on the baseline environment is focused upon the relevant aspects of the environmental characteristics of areas likely to be significantly affected and the likely evolution of the current environment in the absence of the Plan. Being consistent with the strategic provisions of the Plan, this section provides a strategic description of aspects of environmental components which have the greatest potential to be affected by implementation of the Plan.

Article 5 of the SEA Directive states that the report shall include the information that may reasonably be required taking into account:

- Current knowledge and methods of assessment;
- The contents and level of detail in the plan or programme and its stage in the decision-making process; and
- The extent to which certain matters are more appropriately assessed at different levels in that process in order to avoid duplication of the assessment.

What this means in practice is, inter alia, with regard to Plan, that SEA involves collating currently available, relevant environmental data; it does not require major new research.

The administrative area of Dún Laoghaire-Rathdown County Council for which the Plan has been prepared comprises 125.8 km², the smallest administrative County area in the country. The area stretches a maximum distance of 14.8 km in an east-west direction and a maximum distance of 14.6 km in a north-south direction.

The administrative area of Wicklow County Council lies to the south of the County while the administrative areas of Dublin City Council and South Dublin County Council lie to the north and west of the County respectively. The eastern and most of the northern boundary are confined by the sea. The remainder of the northern boundary is guided by the River Dodder to the north-west. The Owendoher River and various field boundaries define the western boundary.

The County consists of extensive suburbs with embedded towns and villages, agricultural lands and natural/semi-natural upland areas. Approximately two thirds of the County is made of the built-up area which forms part of suburban Dublin and comprises various uses including residential, commercial and industrial. The remaining one third can be described as rural settlement which disperses into agricultural lands and then rises into the upland scenic area of the Dublin Mountains.

In terms of landscape, the County has a significant coastal landscape and seascape - with 17 kilometres of coastline stretching along the north and east of the County - and significant upland landscapes which comprises the Dublin Mountains and their foothills - the Mountains rise in excess of 500m in places such as Two Rock, Glendoo and Glencullen.

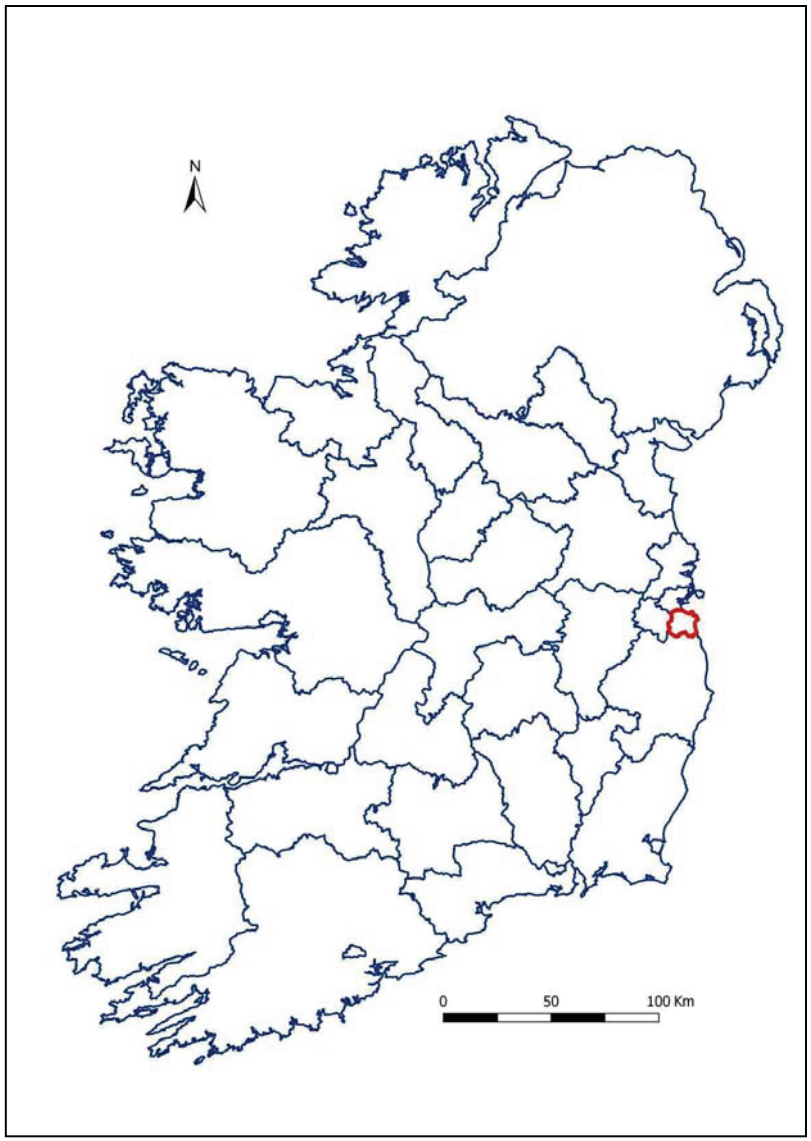

Figure 4.2 Context of the Plan area in relation to the island of Ireland

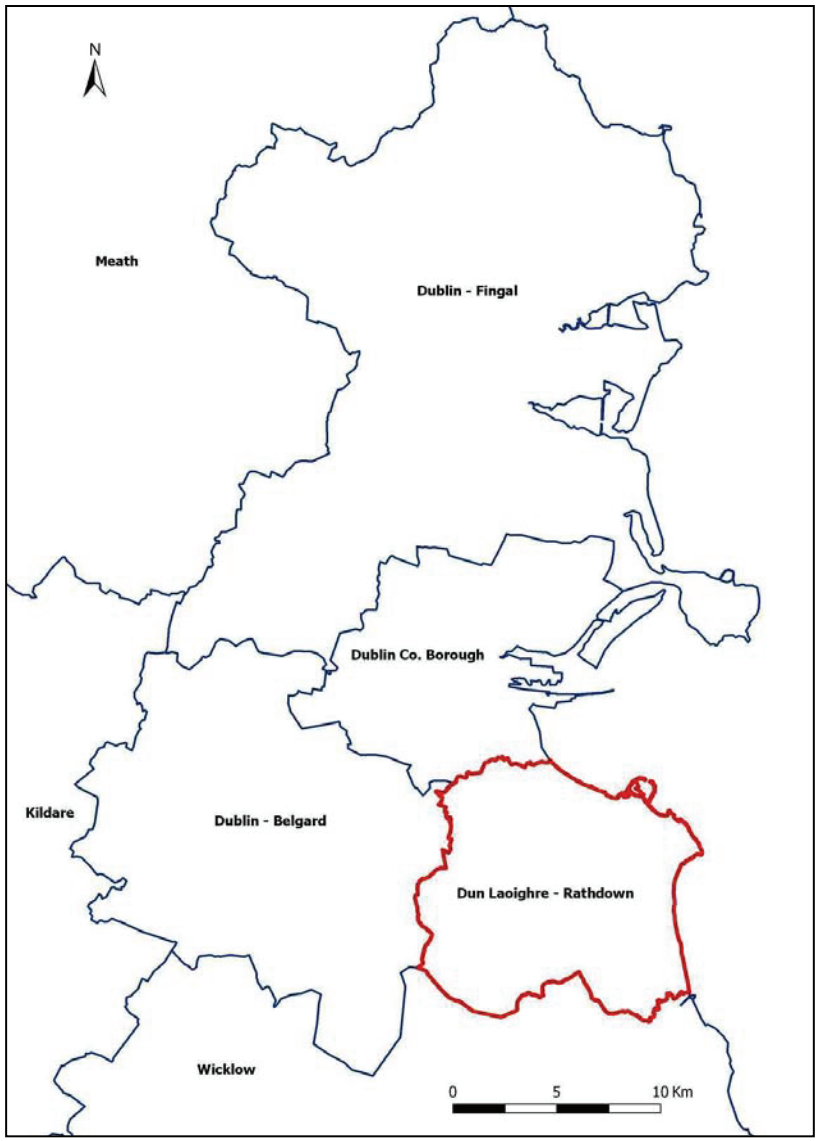

Figure 4.1 Context of the Plan area in relation to County Dublin and surrounding region

Figure 4.3 Ordnance Survey map of the Plan area

4.2 Likely Evolution of the Environment in the Absence of a new Plan

In the absence of a new Plan it is uncertain how permission for new development would be applied for and evaluated.

The 2010 County Plan has contributed towards environmental protection within Dún Laoghaire-Rathdown.

If the 2010 Plan was to expire and not be replaced by a new Plan, this would result in a deterioration of the County's planning and environmental protection framework. Although higher level environmental protection objectives – such as those of various EU Directives and transposing Irish Regulations – would still apply, the deterioration of this framework would mean that new development would be less coordinated and controlled. Such development could result in an increase in the occurrence of adverse effects on all environmental components, especially those arising cumulatively. Cumulative effects occur as a result of the addition of many small impacts to create one larger, more significant, impact.

Such adverse effects could include:

- Loss of biodiversity with regard to Natura 2000 Sites and Annexed habitats and species;
- Loss of biodiversity with regard to ecological connectivity and 'stepping stones';
- Loss of biodiversity with regard to designated sites including Wildlife Sites and listed species;
- Spatially concentrated deterioration in human health;
- Damage to the hydrogeological and ecological function of the soil resource;
- Adverse impacts upon the status and quality of water bodies, including bathing waters;
- Increase in the risk of flooding;
- Failure to provide adequate and appropriate waste water treatment;
- Failure to comply with drinking water regulations and serve new development with adequate drinking water that is both wholesome and clean;
- Increases in waste levels;
- Failure to contribute towards sustainable transport and associated impacts;
- Effects on entries to the Record of Monuments and Places and other archaeological heritage;
- Effects on entries to the Records of Protected Structures and other architectural heritage; and
- Occurrence of adverse visual impacts.

4.3 Biodiversity and Flora and Fauna

4.3.1 Overview of High Value Biodiversity

Dún Laoghaire-Rathdown supports a variety of natural and semi-natural habitats and a wide range of plant and animal species, which have come under threat due to development pressures and increased demand for new development land.

Green space, which makes up a large part of the southern portion of the County, consists of a variety of habitats including corridors which provide for the movement of wildlife. Green space within Dún Laoghaire-Rathdown is comprised of agricultural lands, bogs and heath in the uplands, woodlands, grasslands and a number of open spaces in residential areas. There are also a number of large parks within the County including Marlay Park, Deerpark, Cabinteely Park and Shanganagh Park.

The Loughlinstown River, with tributaries such as the Shanganagh River and the Cabinteely, Ballyogan and the Glenamuck Streams, forms the largest catchment in Dún Laoghaire-Rathdown. The southernmost branch of the River, also known as Brides Glen stream, is particularly rich in biodiversity. Trout, otter, and bats occur in the river while kingfisher may be present along sections of the stream. Other rivers supporting good areas of biodiversity include the Little Dargle which rises in Three Rock Mountain and flows through Marlay Park and the Glencullen River, which drains the uplands around Glendoo and Glencullen Mountains before crossing the County boundary into County Wicklow.

The County's coastline, including areas such as South Dublin Bay and the Dalkey Coastal Zone, provides a number of habitats for a variety of species. The Shanganagh Coastline represents a long stretch of the Killiney Bay shoreline, extending from Ballybrack to Bray in Wicklow. The area is important particularly for its sedimentary cliffs, displaying clear geological time sequences through the quaternary period. The shoreline also has an example of a drowned forest, visible in the sand only at extreme low tide.

The upland areas around Three Rock and Two Rock Mountains are valuable for their heath habitats and their exposed rocky outcrops. Red grouse, an upland bird species thought to be in decline across the Country, occurs in this area.

Man-made habitats within the Plan area are also important biodiversity areas. Gardens provide habitats for a range of wildlife including various bird species, invertebrates, such as bees and butterflies and mammals, such as hedgehogs, mice, rats and foxes. These species move around between gardens using hedgerows and vegetated areas. These urban green spaces, however small, are therefore of importance as they form part of a network of green spaces across the Plan area including gardens, parks, graveyards, amenity walks, railway lines and patches of woodland and scrub within which animals and plants continue to thrive.

'Treasuring our Wildlife', the Dún Laoghaire-Rathdown Biodiversity Plan, was published in 2009. The Plan identifies areas which are important for biodiversity, threats posed to these areas and lists of targets for the County's biodiversity including the completion of a County Habitats Survey.

The **Dalkey Islands Conservation Plan 2013-2023** was adopted by the Council in September 2013. The Plan sets out guiding principles for the conservation of the heritage and habitats of the island. The Dalkey Islands are protected as an SAC.

White Young Green Environmental was commissioned by Dún Laoghaire-Rathdown County Council to undertake a **Habitat Mapping Survey** and prepare a habitat map[4] of the County based on existing GIS data and a ground survey. On a county level, buildings and built land is identified as being the largest habitat group covering approximately 43% of the County area. Cultivated land, including agriculture was the second largest group type covering approximately 24% of the County. Semi-natural natural habitats covered approximately 17% non-native and disturbed ground covering 17%. Farming and urban dwellings, which are identified as being the main land use and land management activity

[4] White Young Green (2007) *Habitat Mapping Survey for Dún Laoghaire-Rathdown County Council*, Dún Laoghaire-Rathdown County Council

in the area, exerts a major influence upon the local ecology and landscape character.

The Habitat Mapping Survey was undertaken in accordance with the classification scheme identified in by the Heritage Council. This classification scheme covers natural, semi-natural and artificial habitats of terrestrial, freshwater and marine environments and of rural and urban areas. Habitat categories are arranged within a series of ordered groupings to produce a hierarchical framework that operates on three levels. The scheme identifies 11 broad habitat groups (Level 1), 30 habitat subgroups (Level 2), and 117 separate habitats (Level 3).

Surveys to each level can be seen on Figure 4.4 and Figure 4.5 respectively. Analysis of survey data revealed a total of 36 terrestrial habitats recorded from the southern survey area in accordance with Level 3 of the Heritage Council's classification system (2000).

Three **Areas of High Ecological Value** which include a number of high diversity habitats were identified in the Habitat Mapping Survey. These areas are listed and briefly described below.

1. **Upland Region to the South East of the County**

This area, which begins at the Glendoo Mountains, is an upland area with a wide variety of habitat types including upland blanket bog, wet heath, dry siliceous heath, conifer plantation, dense bracken, and pockets of dry humid acid grassland.

2. **Woodland Area to the South East of the County**

Located in the south eastern area of the County, this area includes Ballyman Glen SAC which contains a variety of habitats including habitats listed on Annex I of the Habitats Directive such as alkaline fen and petrifying springs.

3. **Kiltiernan / Loughlinstown Area**

This area is located to the east of Kiltiernan and is surrounded by an area dominated by agricultural grassland lies a large pocket of dry meadows and grassy verges. This habitat is particularly rich in species diversity. Enhancing the ecological value of the area is a large strip of wet grassland, mixed broadleaved woodland, wet pendulate oak-ash-hazel woodland and riparian woodland.

4.3.2 Ecological Networks and Connectivity

Ecological networks are important in connecting areas of local biodiversity with each other and with nearby designated sites so as to prevent islands of habitat from being isolated entities. They are composed of linear features, such as treelines, hedgerows and rivers/streams, which provide corridors or stepping stones for wildlife species moving within their normal range. They are important for the migration, dispersal and genetic exchange of species of flora and fauna particularly for mammals, especially for bats and small birds and facilitate linkages both between and within designated ecological sites, the non-designated surrounding countryside and the more urban areas of the County.

Article 10 of the Habitats Directive recognises the importance of ecological networks as corridors and stepping stones for wildlife, including for migration, dispersal and genetic exchange of species of flora and fauna. The Directive requires that ecological connectivity and areas of ecological value outside the Natura 2000 network of designated ecological sites are maintained and it recognises the need for the management of these areas through land use planning and development policies. Ecological networks are important in connecting areas of local biodiversity with each other and with nearby designated sites so as to prevent islands of habitat from being isolated entities. Ecological networks are composed of linear features, such as treelines, hedgerows, rivers and streams, which provide corridors or stepping stones for wildlife species moving within their normal range. They are particularly important for mammals, especially for bats and small birds.

Within and surrounding the County, the ecological networks are made up of components including the Loughlinstown River, the Little Dargle and the Cabinteely, Ballyogan, and the Glenamuck Streams and their tributaries and banks, the various woodlands, parks, gardens and hedgerows within and surrounding the Plan area and lands used for agriculture.

These components provide habitats for flora and fauna and facilitate linkages to the surrounding countryside for flora and fauna.

A hedgerow survey of the west, south and central parts of the Plan area has been undertaken as part of the Habitat Mapping Survey described above. The hedgerow survey identifies the most important hedgerows in the County in terms of their biodiversity.

Parks and open spaces cover over 800 hectares of the County. Prominent parks include Marlay Park, Cabinteely Park, The Peoples Park, Killiney Hill Park and the seafront from Dún Laoghaire to Sandycove. These parks and open spaces provide for a range of habitats for various species within the Plan area.

Ecological islands or areas of habitat that are not connected to surrounding ecologically valuable habitats are mainly found to the north of the study area, where development pressures are highest.

The county-wide Ecological Network Map that was prepared as part of the Plan preparation process is provided at Figure 4.6. This map is taken from Appendix 3 of the Plan. The Network, which extends beyond the County into neighbouring counties, has been prepared using data derived from the various biodiversity studies that have been undertaken in recent years as part of the County Biodiversity Plan. Not all areas studied have been mapped as many are already subsumed into and incorporate parts of the high amenity, green belt, agricultural and open space zoning objective areas which are all shown on the map. However a number of areas have been shown - namely the ten upland areas studied and also the calcareous grasslands at Kingston, Kiltiernan. These areas are not currently afforded any statutory protection but the local studies in relation to these areas have concluded that they are worthy of pNHA status.

Biodiversity studies informing the Ecological Network Map include the following assessments which have been undertaken either in-house or by consultants commissioned by Dún Laoghaire-Rathdown County Council:

- Dún Laoghaire-Rathdown County Habitats Survey (2007), White Young Green.
- Dún Laoghaire-Rathdown Hedgerow Survey (2008), RSK Carter Ecological.
- Calcereous Grasslands at Kingston, Kiltiernan (2009), Melinda Lyons.
- Landscape Conservation for Irish bats. Summary report for Dún Laoghaire-Rathdown, 2012, Bat Conservation Ireland.
- A Report on the Collation and Review of Biodiversity Data for the Coastal zone (2009), Golder Associates.
- Assessment of the Nature Conservation Value of Loughlinstown Wood (2012), Denyer Ecology.
- Report to Dún Laoghaire-Rathdown County Council on the Rare Plant Survey (2009 & 2010), David Nash and Sylvia Reynolds.
- A Survey of Squirrel Populations in Barnaslingan, Carrickgollogan, Ticknock & Kilmashogue Woodlands (2010), Geoff Hamilton.
- 'Parklife' - a Policy for Enhancing Biodiversity in Parks and Green Spaces 2010. DLRCC.
- River Dodder Biodiversity Study and Management Plan (2010), Mary Tubridy.
- Management of Knotweed along the River Dodder (2011), Mary Tubridy.
- Bride's Glen Ecological Assessment (2012), Denyer Ecology.
- Otter Survey, Bride's Glen (2012), Scott Cawley.
- Assessment of the Nature Conservation Value of Ten Upland Sites in Dún Laoghaire-Rathdown (2011), Denyer Ecology.
- Cabinteely House Bat Survey (2010), Tina Aughney.
- Marlay House Bat Survey (2010), Tina Aughney.
- St Helen's Wood Biodiversity Study (2010), DLRCC.
- Ecological Guidance for Local Authorities and Developers (2014).

4.3.3 Land Cover Mapping

The CORINE land cover mapping[5] for Dún Laoghaire-Rathdown classifies land cover under various headings. Land cover categories which indicate lands that are likely to be most valuable to biodiversity are illustrated on Figure 4.7. These lands comprise areas of *Peat Bogs* along and near to the south-western boundary of the Plan area, *Green Urban Areas* to the north and an area of *Mixed Forest* at the southern boundary. Some of these land covers have come about as a result of human interaction with the landscape.

4.3.4 Designations

4.3.4.1 Introduction

There are a number of ecologically designated sites within and surrounding the Dún Laoghaire-Rathdown Plan area.

The County includes five Natura 2000 sites, four Special Areas of Conservation (SACs) and one Special Protection Area. An additional SAC is currently proposed for that portion of Dublin Bay, between Rockabill to Dalkey Islands.

The County also contains ten proposed Natural Heritage Areas. These non-statutory designations were proposed in 1995 but have not since been statutorily proposed or designated. (Nationally 148 bogland sites are designated as NHAs while a further 630 sites remain as proposed NHAs). According to the NPWS, statutory designation will occur on a phased basis over the coming years.

It is noted that some of the ecological sensitivities discussed below – and associated potential for environmental impacts – occur beyond the fringes of the Plan area. They are included, however, to ensure that areas which could be impacted as a result of implementing the Plan are identified and assessed.

4.3.4.2 Candidate Special Areas of Conservation

Candidate Special Areas of Conservation (cSACs) have been selected for protection under the European Council Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC) by the DECLG due to their conservation value for habitats and species of importance in the European Union. The sites are *candidate* sites because they are currently under consideration by the Commission of the European Union.

The Habitats Directive seeks to establish Natura 2000, a network of protected areas throughout the EU. It is the responsibility of each member state to designate SACs to protect habitats and species, which, together with the SPAs designated under the 1979 Birds Directive, form Natura 2000.

There are four cSACs within the Plan area to include South Dublin Bay cSAC, Ballyman Glen cSAC, Knocksink Wood cSAC and Wicklow Uplands cSAC.

Figure 4.8 maps cSACs and SPAs within the County while Figure 4.9 maps all cSACs and SPAs within 15km of the County as well as providing the name and site code for each.

The Zone of Influence of the Plan with respect to impacts upon ecology via surface waters upon ecological resources – including designated ecology – can be estimated to be all Water Management Units (WMUs) either wholly within or partially within the County, connected WMUs and connected estuarine and coastal water bodies. WMUs are mapped on Figure 4.8.

4.3.4.3 Special Protection Areas

Special Protection Areas (SPAs) have been selected for protection under the 1979 European Council Directive on the Conservation of Wild Birds (79/409/EEC) - referred to as the Birds Directive - by the DECLG due to their conservation value for birds of importance in the European Union.

The South Dublin Bay and River Tolka Estuary SPA lies to the north of the Plan area while the

[5] CORINE Land Cover (CLC) is a map of the European environmental landscape based on interpretation of satellite images. Land cover is the observed physical cover, as seen from the ground or through remote sensing, including for example natural or planted vegetation, water and human constructions which cover the earth's surface. Because of the scale of the CORINE data and the method by which it was collected there are likely to be a number of inaccuracies at the local level. It is noted, however, that the land cover shown on the maps is generally accurate. The European Environment Agency, in conjunction with the European Space Agency, the European Commission and member countries is currently updating the CORINE land cover database.

Dalkey Islands SPA lies to the east and the Wicklow Mountains SPA lies to the south.

Figure 4.8 maps cSACs and SPAs within the County while Figure 4.9 maps all cSACs and SPAs within 15km of the County as well as providing the name and site code for each.

4.3.4.4 Natural Heritage Areas

Natural Heritage Areas (NHAs) are designated due to their national conservation value for ecological and/or geological/geomorphological heritage. They cover Nationally important semi-natural and natural habitats, landforms or geomorphological features, wildlife plant and animal species or a diversity of these natural attributes. NHAs are designated under the Wildlife (Amendment) Act 2000.

Proposed NHAs in the Plan area including Booterstown Marsh pNHA, Ballybetagh Bog There are ten pNHA, Fitzsimon's Wood pNHA, Dingle Glen pNHA, Loughlinstown Wood pNHA and Dalkey Coastal Zone and Killiney Hill pNHA. South Dublin Bay SAC, Ballyman Glen SAC and Knocksink Wood SAC are also designated as pNHAs.

The Scalp and the Shanganagh Coastline are recognised as being of NHA status for their geological interest (see Section 4.5.3)

4.3.4.5 Ramsar Sites

Ramsar sites are designated and protected under the Convention of Wetlands of International Importance, especially as Water Fowl Habitat, which was established at Ramsar in 1971 and ratified by Ireland in 1984. Ireland presently has 45 sites designated as Wetlands of International Importance, with surface areas of 66,994 hectares.

The objective of a Ramsar site is the conservation of wetlands for wildfowl. While Ireland ratified the Ramsar Convention in 1984 there is no legal backing for Ramsar sites unless they are also Nature Reserves or SPAs and as such are protected by the Wildlife Acts 1976 and 2000 or the Birds or Habitats Directives.

Sandymount Strand/Tolka Estuary (Site No. 4024) was designated a Ramsar Site on 11 June 1996 and provides 654 hectares of Wetlands of International Importance. The exact boundaries of the Ramsar designation were unavailable from the Ramsar Sites Information Service however they are likely to be similar to those of Sandymount Strand/Tolka Estuary SPA.

4.3.4.6 Register of Protected Areas

In response to the requirements of the Water Framework Directive a number of water bodies or parts of water bodies which must have extra controls on their quality by virtue of how their waters are used by people and by wildlife have been listed on Registers of Protected Areas (RPAs) (entries to the RPAs have been detailed further under Section 4.6.5).

4.3.4.7 Salmonid Waters

The main channel of the River Dargle is designated and protected as a Salmonid Water under the European Communities (Quality of Salmonid Waters) Regulations 1998 (SI No. 293 of 1988). Designated Salmonid Waters are capable of supporting salmon (Salmo salar), trout (Salmo trutta), char (Salvelinus) and whitefish (Coregonus). Although the River Dargle does not flow through the Plan area, a tributary of the Dargle does flow through the south eastern corner of the Plan area.

The Dodder, which rises to the south east of the Plan area and flows along the north-east boundary, and several of its tributaries are exceptional in the area in supporting Atlantic Salmon and Sea Trout in addition to resident Brown Trout populations, eels and other fish species.

The Glencullen River flows through the south east of the plan area. The Glencullen is a tributary of the River Dargle and, along with its tributaries, constitutes a Salmonid system. The Carrickmines (Glenamuck) / Shanganagh system is a regionally important Salmonid system. The Carrickmines system supports a resident population of Brown Trout and a migratory population of Sea Trout. The lower reaches of the Deansgrange Stream support a small but significant population of Brown Trout.

4.3.5 Existing Problems

Previous developments such as residential and commercial developments, along with the provision of transportation infrastructure, have resulted in loss of biodiversity and flora and fauna across the County however legislative objectives governing biodiversity and fauna were not identified as being currently conflicted with.

The County Development Plan includes robust measures to contribute towards the protection of biodiversity and flora and fauna.

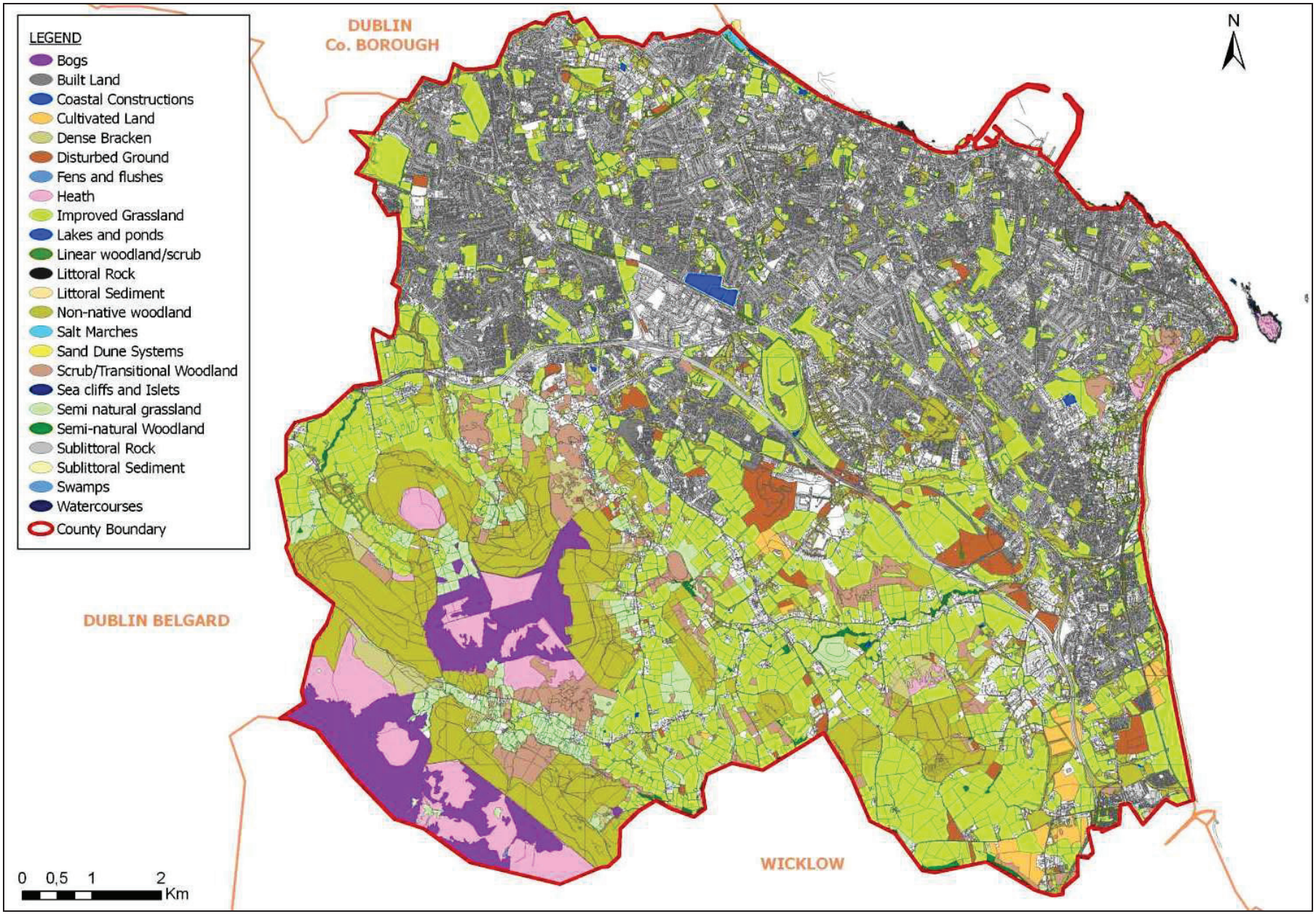

Figure 4.4 Habitats Survey - Level Two
Source: *White Young Green for Dún Laoghaire-Rathdown County Council (2007) Habitat Mapping Survey*

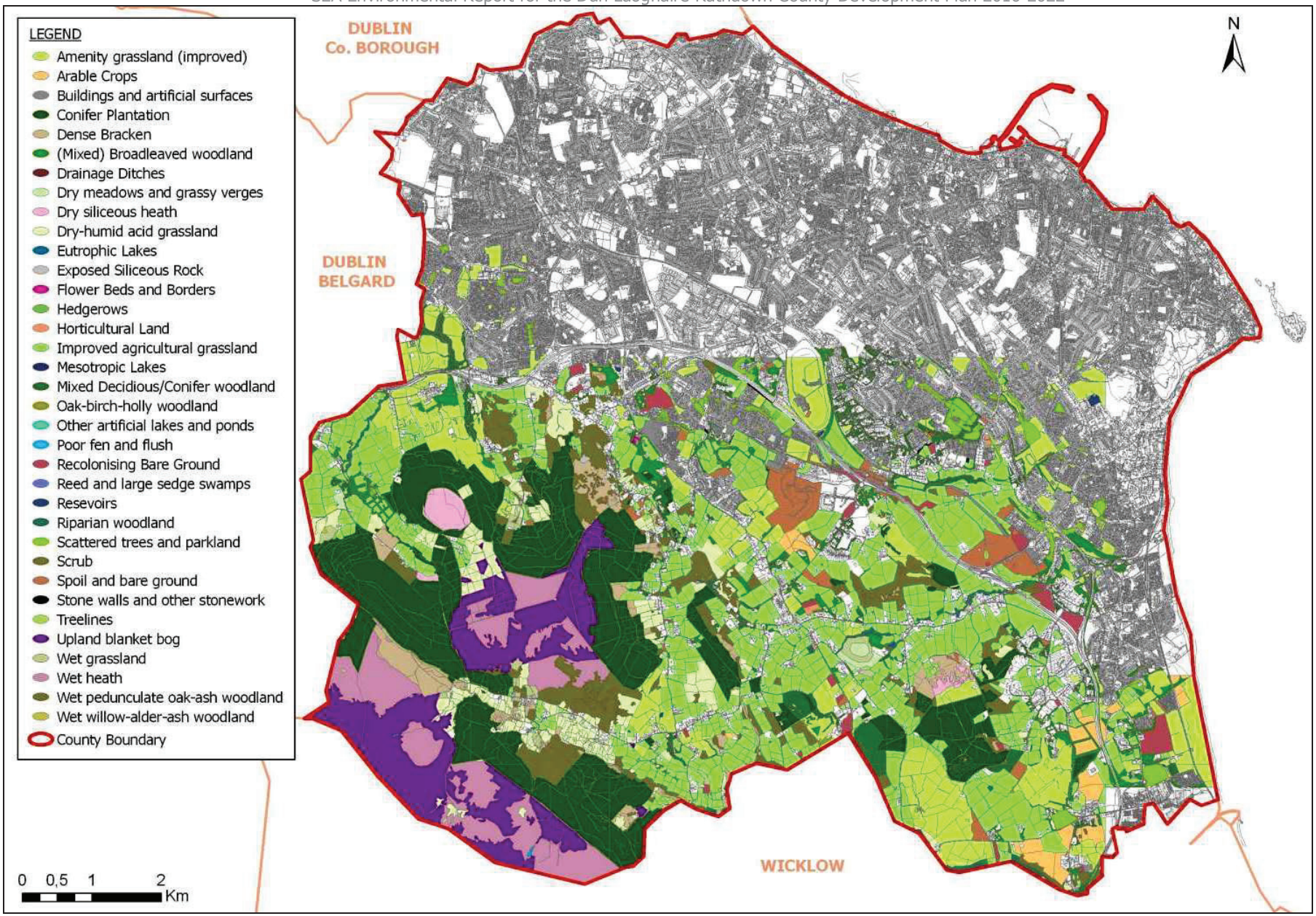

Figure 4.5 Habitats Survey - Level Three
Source: *White Young Green for Dún Laoghaire-Rathdown County Council (2007) Habitat Mapping Survey*

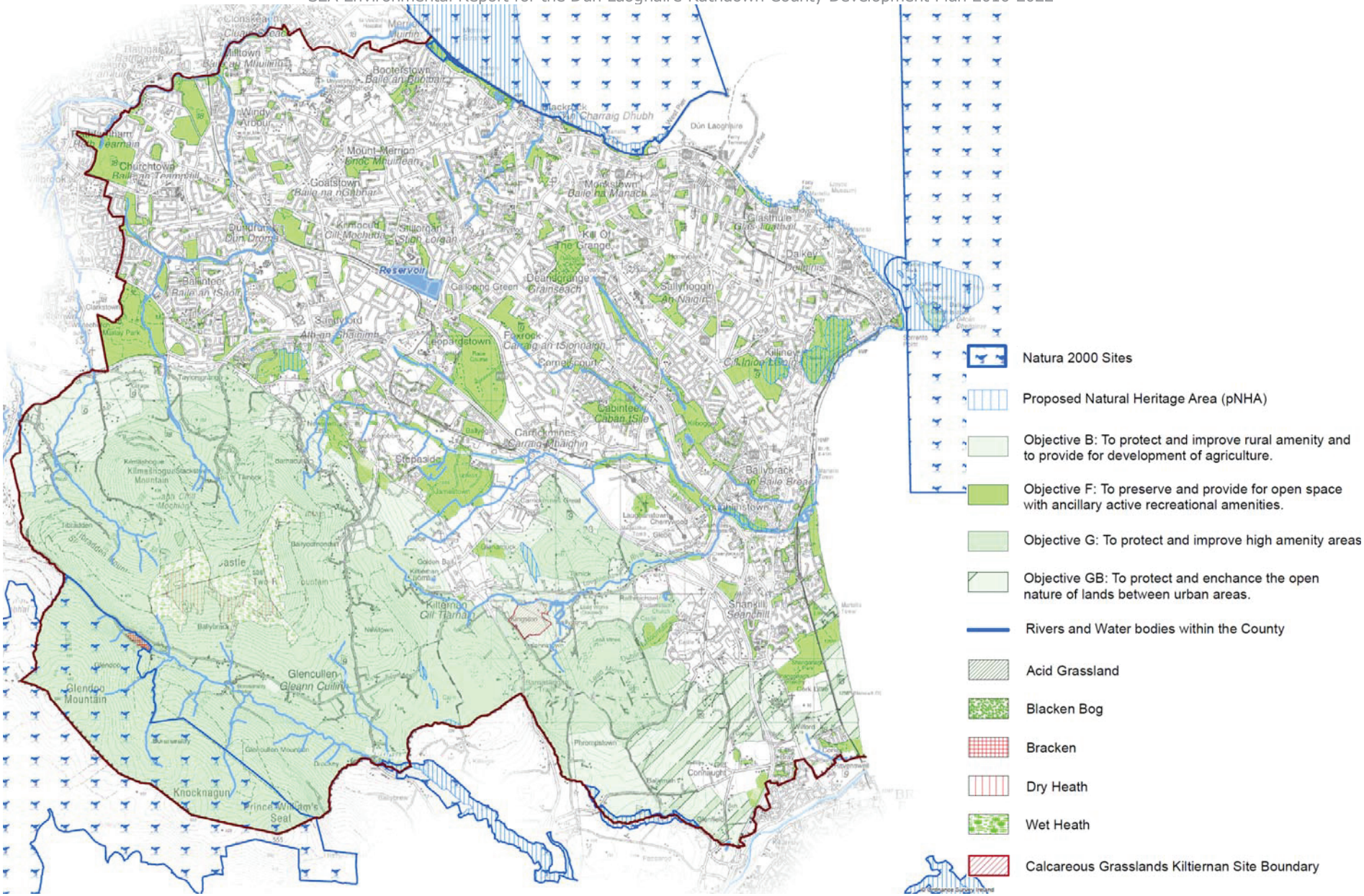

Figure 4.6 Ecological Network Map
Source: *Appendix 3 Dún Laoghaire-Rathdown County Development Plan 2016-2022*

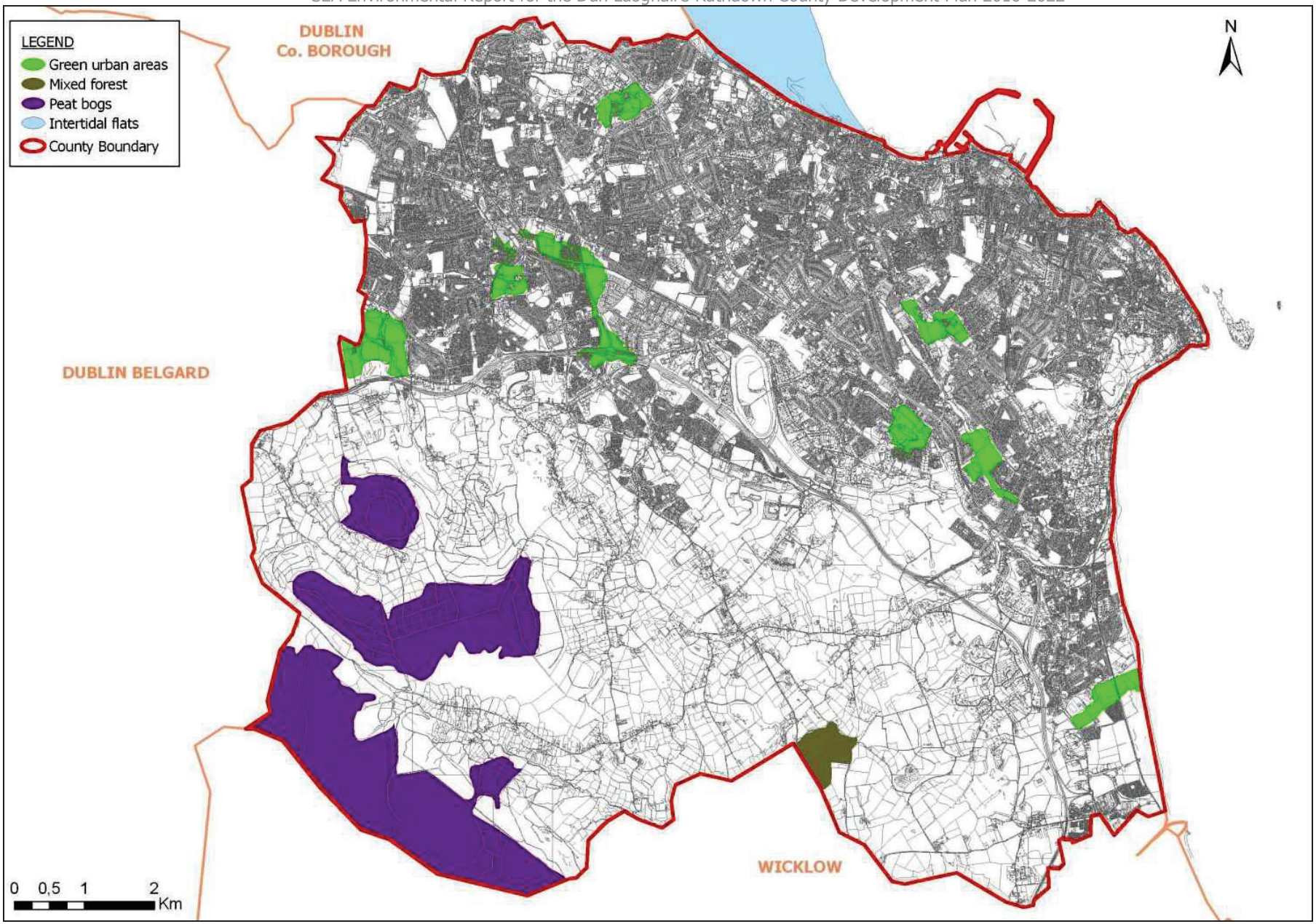

Figure 4.7 CORINE Land Cover Categories which indicate lands which are likely to be most valuable to biodiversity
Source: European Environment Agency (2012) CORINE Land Cover Mapping 2006

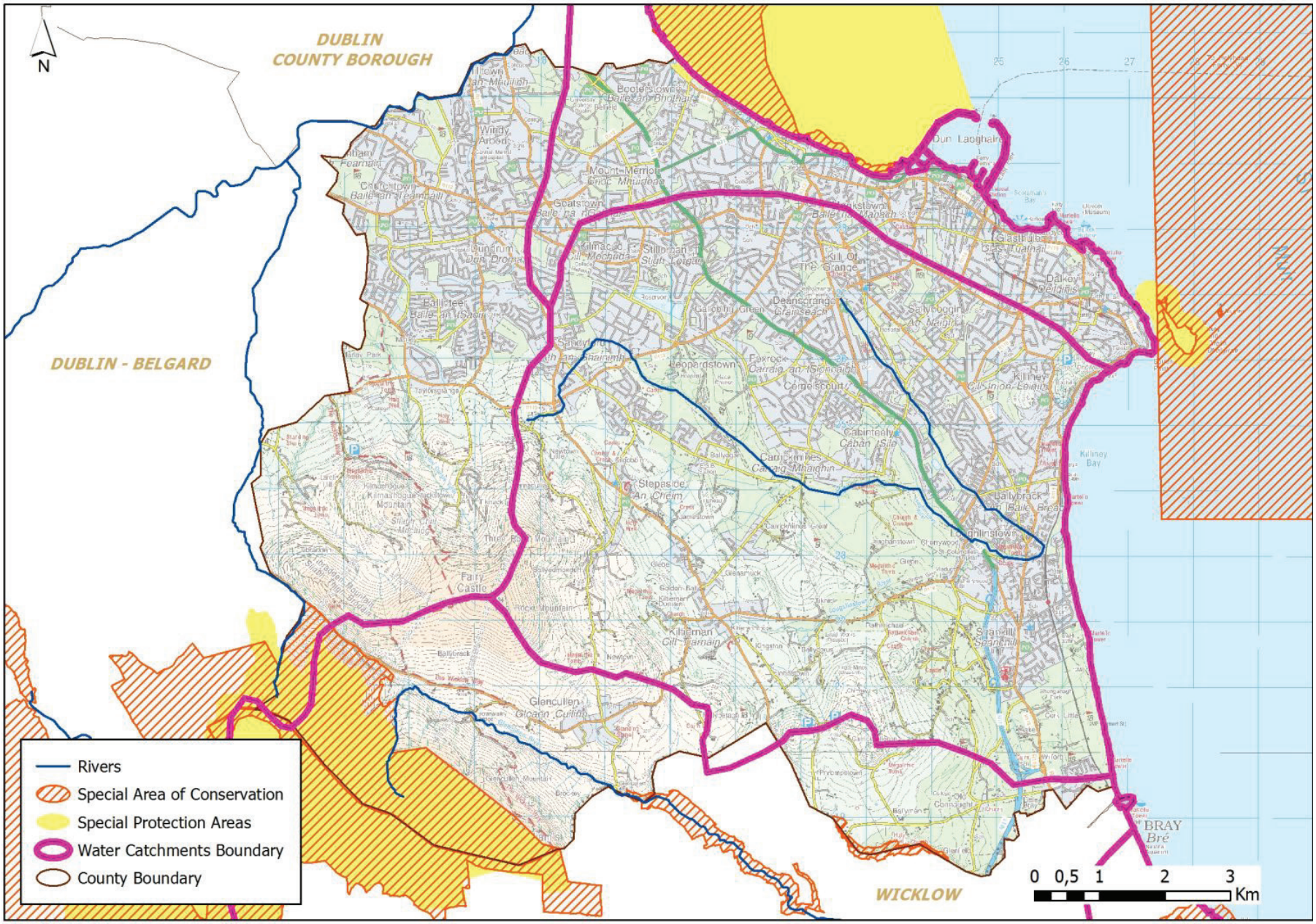

Figure 4.8 SPAs and cSACs with Water Management Units
Source: NPWS (datasets downloaded July, 2014)

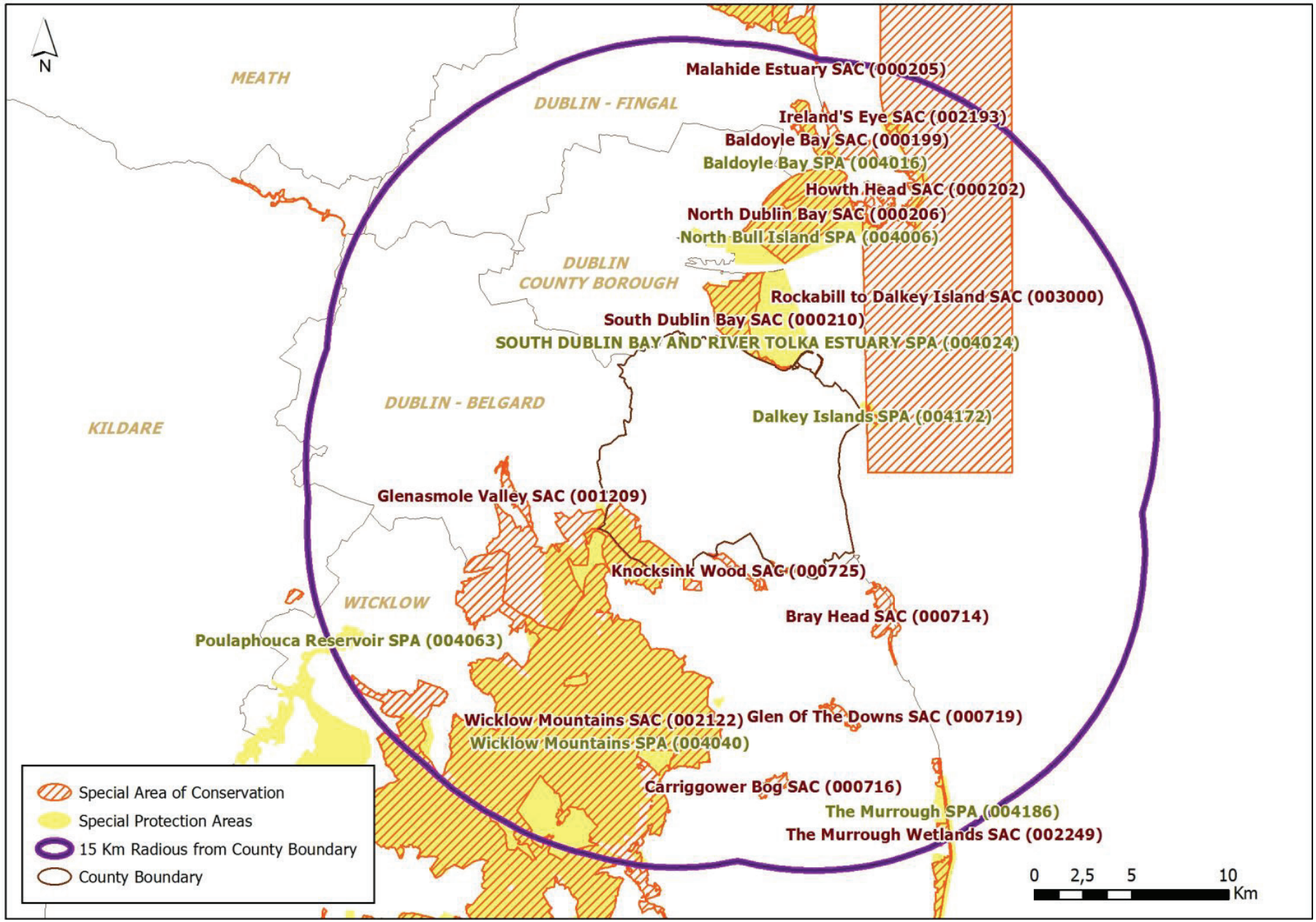

Figure 4.9 SPAs and cSACs with names and 15km Buffer Area
Source: NPWS (datasets downloaded July, 2014)

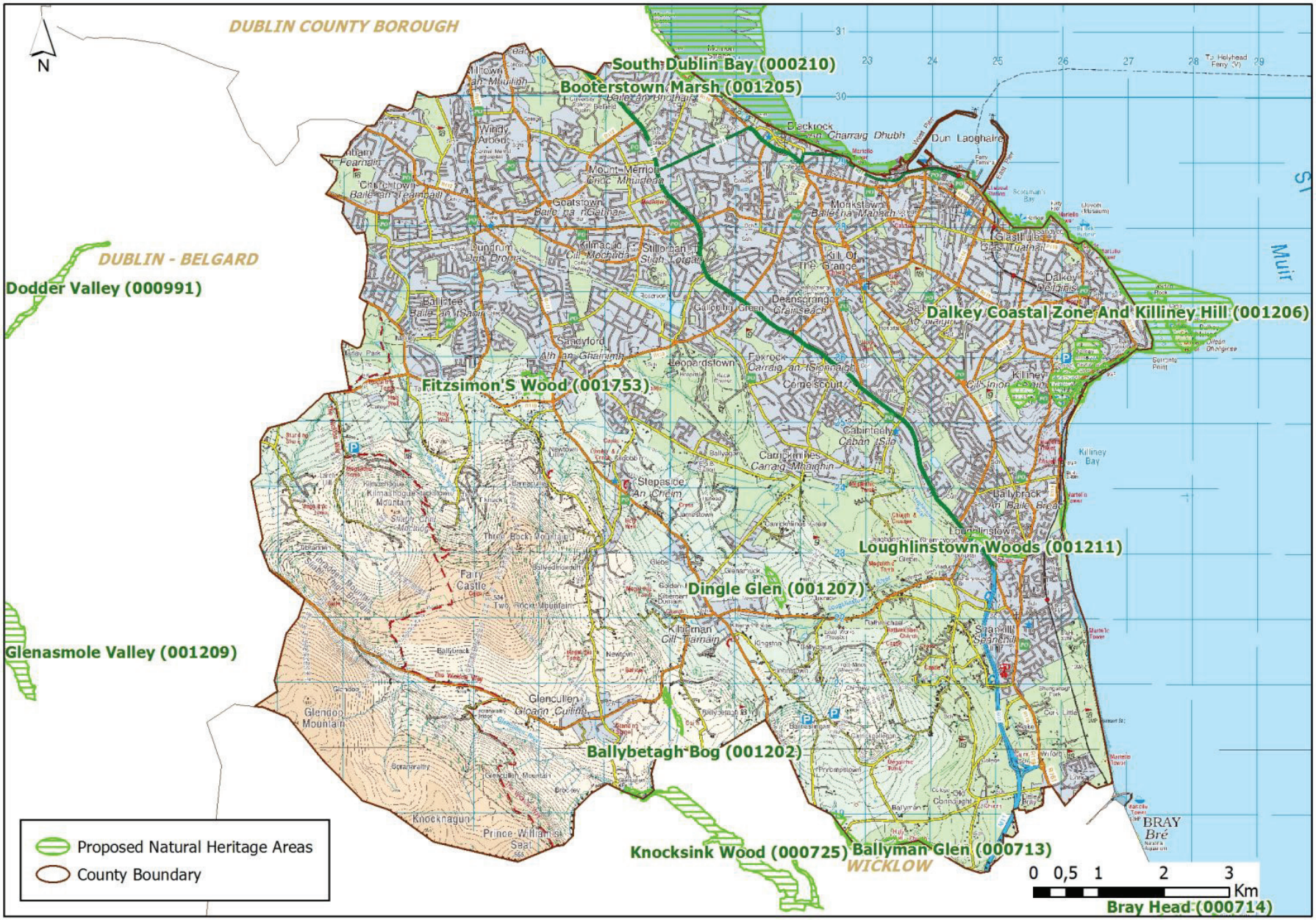

Figure 4.10 Proposed Natural Heritage Areas in the plan area
Source: NPWS (datasets downloaded July 2014)

4.4 Population and Human Health

4.4.1 Population

Dublin has experienced strong population growth in recent years. Dublin's population increased from 1.18 million persons in 2006 to 1.27 million persons in 2011, an increase of more than 83,000 people (7%). Dún Laoghaire-Rathdown has experienced a share of this growth after a period of relatively low growth in the previous decade.

Dún Laoghaire-Rathdown has a current population of 206,261. This represents 16% of Dublin's population. The population grew by 12,223 persons or 6.3%, between 2006 and 2011, at a time when the National increase was 8.2%. This was a significant increase on the previous 10 years where the County grew by just 4,039 persons.

The 2011 Census highlighted a high percentage of 14.5% in the over 65 age category compared to the national average of 11.7%. According to the CSO, 23% of houses in the County have one occupant. In contrast, Dún Laoghaire-Rathdown has a lower percentage of population in the 0-14 age bracket of 18.2% compared to the National average of 21.3%.

A key feature of population change in the County has been the uneven distribution of growth, with some areas experiencing strong population growth and other areas experiencing stagnation or decline. The large Glencullen District Electoral Division, for example, grew by 10,661 persons or 29%. Table 4.1 illustrates the population for each DED in the Plan area[6].

Housing densities in the Plan area are high in the urban regions and comparatively low in the rural uplands. Spatial distribution of the population in the uplands is generally one-off housing, linear in parts. The majority of the population located in the lower-lying north, west, north, eastern and central parts of the Plan area.

[6] Source: CSO Census 2011

Table 4.1 Population Change by DED Source: CS0 Census 2011

Ward	Census 2006	Census 2011	Population Change on Previous Census	% Population Change on Previous Census
Ballybrack	41,384	33,187	-8,197	-24.7%
Blackrock	29,455	30,990	1,535	4.95%
Dundrum	37,373	37,743	370	0.98%
Dún Laoghaire	40,182	40,852	670	1.64%
Glencullen	25,804	36,465	10,661	29.24%
Stillorgan	19,840	27,024	7,184	26.58%
Total	194,038	206,261	12,223	5.93%

4.4.2 Human Health

Human health has the potential to be impacted upon by environmental vectors (i.e. environmental components such as air, water or soil through which contaminants or pollutants, which have the potential to cause harm, can be transported so that they come into contact with human beings). Hazards or nuisances to human health can arise as a result of exposure to these vectors arising from incompatible adjacent land uses for example. These factors have been considered with regard to the description of: the baseline of each environmental component; and the identification and evaluation of the likely significant environmental effects of implementing the Plan.

4.4.3 Existing Problems

The greatest health risk from radiation in Ireland is caused by radon. The presence of radon gas, a naturally occurring radioactive gas that originates from the decay of uranium in rocks and soils, occurs across the country. It accounts for more than half of the total radiation dose received by the Irish population. As a known carcinogen, in the same category as tobacco smoke and asbestos it is a cause of lung cancer. Exposure to radon for long periods or at high concentrations can lead to lung cancer.

Some areas within Dún Laoghaire-Rathdown are estimated as having 5-15% of homes to be above the reference level for Radon (mapping available at http://www.epa.ie/radiation/radonmap).

There is historic and predictive evidence of flooding in various locations across the County (see information on Strategic Flood Risk Assessment at Section 4.6.6). All recommendations made by the SFRA and SEA in relation to flood risk management have been integrated into the Plan.

Compliance issues in relation to water services are detailed under Section 4.8.1.

4.5 Soil

4.5.1 Introduction

Soil is the top layer of the earth's crust. It is formed by mineral particles, organic matter, water, air and living organisms. Soil can be considered as a non-renewable natural resource because it develops over very long timescales. It is an extremely complex, variable and living medium and performs many vital functions including: food and other biomass production, storage, filtration and transformation of many substances including water, carbon, and nitrogen. Soil has a role as a habitat and gene pool, serves as a platform for human activities, landscape and heritage and acts as a provider of raw materials. Such functions of soil are worthy of protection because of their socio-economic as well as environmental importance. Soils in any area are the result of the interaction of various factors, such as parent material, climate, vegetation and human action.

To date, there is no legislation which is specific to the protection of soil resources. However, there is currently an EU Thematic Strategy on the protection of soil which includes a proposal for a Soil Framework Directive which proposes common principles for protecting soils across the EU.

4.5.2 Soil Types

Figure 4.11 shows the distribution of soil types across the Plan area. 4.3 *Urban soils* make up the northern, most built-up section of the Plan area. The majority of the Plan area is covered by *grey brown podzols* with areas of *brown podzolics, peaty podzols and litosols and outcropping rock* existing as the Plan area extends to the south west.

Urban soils are soils which have been disturbed, transported or manipulated by human activity in the urban environment and are often overlain by a non-agricultural, man-made surface layer that has been produced by mixing, filling or by contamination of land surfaces in urban and suburban areas. *Urban soils* have a combination of characteristics that differ from natural soils. These characteristics are due to alterations in both physical and chemical soil properties that cause long term deviation from the natural state.

Grey brown podzolic soils are usually formed from a calcareous parent material, which counteracts the effects of leaching. Because of this, the podzolisation process is restricted and the principal materials translocated down the soil profile are the clay particles themselves. The lighter texture *grey brown podzolics* are good all-purpose soils, while the heavier textured members are highly suited to pasture production, responding well to manurial and management practices.

Brown podzolic soils are somewhat similar to the *podzols* and have been formed under the influence of the same process. They are less depleted than the *podzols* and the surface layer contains organic matter is intimately mixed with mineral matter. Because of their desirable physical characteristics, *brown podzolics* are often devoted extensively to cultivated cropping and pasture production. Their inherent low nutrient status is easily overcome by addition of lime and fertiliser.

Lithosols are skeletal stony soils, usually overlying solid or shattered bedrock. They are often associated with *podzols* at higher elevations. Generally such soil areas have bare rock outcropping at frequent intervals and many also have steep slopes. Their use-range is usually limited to rough grazing.

4.5.3 Sites of Geological Interest

Sites of Geological Interest within the County were identified in a submission made by the Geological Survey of Ireland as part of the Plan preparation process as follows: Ballybetagh Bog; Ballycorus; Balackrock Breccia; Carrickgollogan; Dalkey Hill; Dalkey Island; Killeny Hill; Murphystown Quarry; The Scalp; Three Rock Mountain; and White Rock Killarney.

4.5.4 Contaminated Soil

Given the urban nature of the County and the range of land use activities which have taken place historically, soils have been contaminated in the past. Such contamination has the potential to affect water quality, biodiversity and flora and fauna and human health. The County Development Plan requires that where brownfield redevelopment is proposed, adequate and appropriate investigations are carried out into the nature and extent of any soil and groundwater contamination and the risks associated with site development work.

4.5.5 Existing Problems

Legislative objectives governing soil were not identified as being conflicted with.

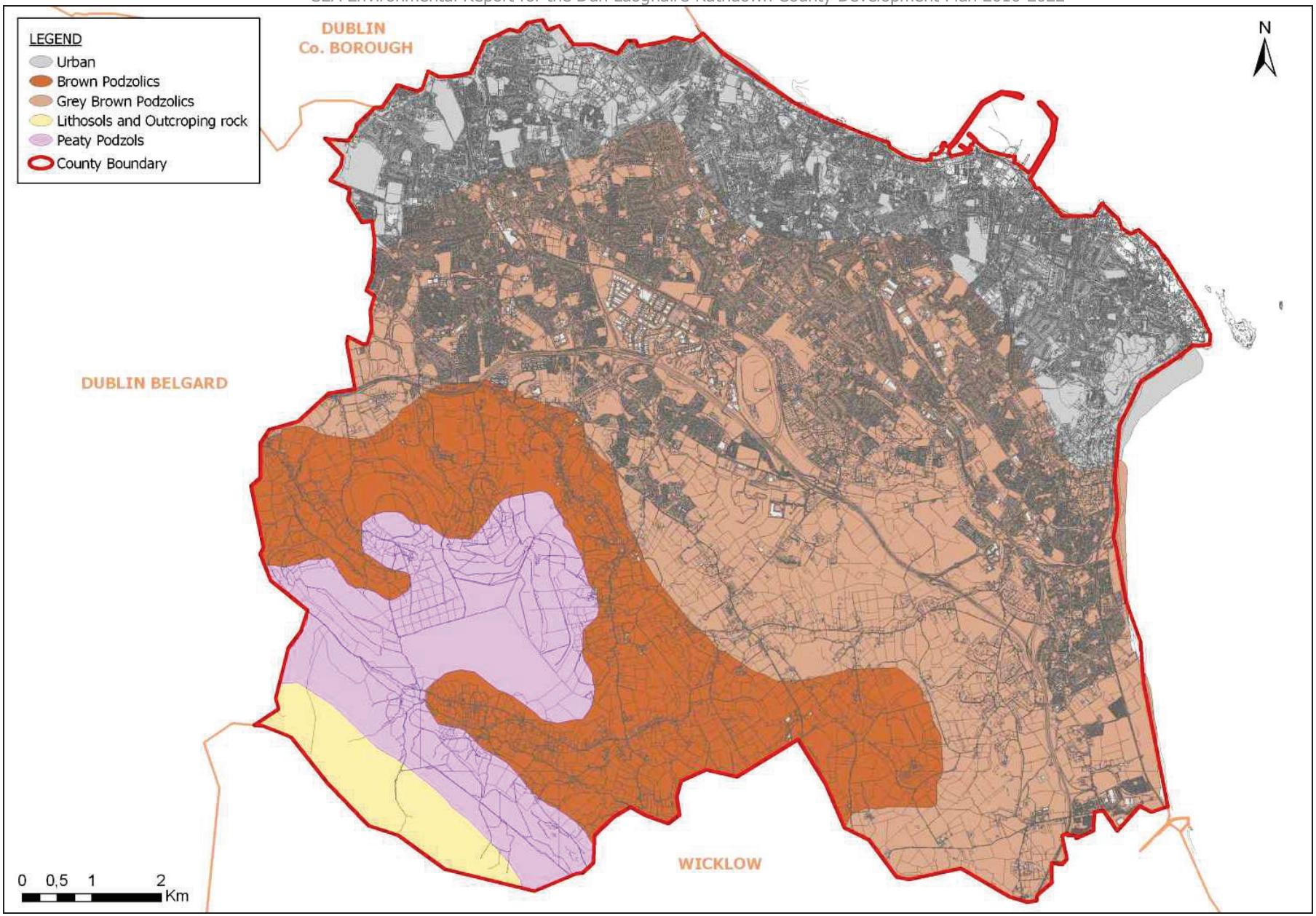

Figure 4.11 Soil Types
Source: Teagasc, GSI, Forest Service & EPA (2006) *Soil Type*

4.6 Water

4.6.1 Potential Pressures on Water Quality

Human activities, if not properly managed, can cause deterioration in water quality. Pressures exerted by human activities include the following:

- sewage and other effluents discharged to waters from point sources, e.g. pipes from treatment plants;
- discharges arising from diffuse or dispersed activities on land;
- abstractions from waters; and
- structural alterations to water bodies.

A point source pressure has a recognisable and specific location at which pollution may originate. Examples of significant point source pressures include direct discharges from waste water treatment plants, licensed discharges from industrial activities, landfills, contaminated lands (e.g. disused gas works) and mines.

A diffuse source pressure unlike a point source is not restricted to an individual point or location. The source of a diffuse pressure can be quite extensive. Significant examples of diffuse pressures include runoff from forestry and agricultural lands.

Excessive abstractions from surface waters and groundwater for drinking and industrial purposes can create pressures on the ability of a water body to maintain both chemical and ecological status.

Structural alterations such as river straightening; construction of embankments, weirs, dams, port facilities and dredging can create conditions such that a water body is no longer able to support the natural ecology which would have existed prior to such modifications. These pressures are also referred to as morphological pressures.

4.6.2 The Water Framework Directive

4.6.2.1 Introduction and Requirements

Since 2000, Water Management in the EU has been directed by the Water Framework Directive 2000/60/EC (WFD). The WFD requires that all Member States implement the necessary measures to prevent deterioration of the status of all waters - surface, ground, estuarine and coastal - and protect, enhance and restore all waters with the aim of achieving "good status". All public bodies are required to coordinate their policies and operations so as to maintain the good status of water bodies which are currently unpolluted and improve polluted water bodies to good status.

Article 4 of the WFD sets out various exemptions for deterioration in status caused as a result of certain physical modifications to water bodies. This is provided: all practicable mitigation measures are taken; there are reasons of overriding public interest or the benefits to human health, safety or sustainable development outweigh the benefits in achieving the WFD objective; there are no better alternatives; and the reasons for the physical modification are explained in the relevant river basin management plan.

4.6.2.2 River Basin Districts and Water Bodies

For the purpose of implementing the WFD, Ireland has been divided into eight river basin districts or areas of land that are drained by a large river or number of rivers and the adjacent estuarine/coastal areas. The management of water resources will be on these river basin districts. Dún Laoghaire-Rathdown falls within the Eastern River Basin District (EBRD)

Within each river basin district - for the purpose of assessment, reporting and management - water has been divided into groundwater, rivers, lakes, estuarine waters and coastal waters which are in turn divided into specific, clearly defined water bodies.

4.6.2.3 River Basin Management Plan

Local Authorities, including Dún Laoghaire-Rathdown County Council, have prepared the Eastern River Basin Management Plan which is being implemented through, inter alia, the County Development Plan, in order to help

protect and improve waters in the County and wider RBD. The Management Plan provides specific policies for individual river basins in order to implement the requirements of the WFD.

4.6.3 Surface Water

4.6.3.1 Introduction

The main rivers within the Plan area are the Loughlinstown River, the Glencullen River, the Little Dargle River and the River Dodder.

The Loughlinstown (or Shanganagh) River has a number of tributaries which merge in Loughlinstown. The most southerly of these tributaries rises in Kilternan near Two Rock Mountain. The next of these tributaries rises to the north of this, near Stepaside and flows through Carrickmines, a number of smaller streams merge with it on the way. Another tributary rises in Cornelscourt and flows to the south east. A final stream rises in Deansgrange and flows to the south east to meet the Loughlinstown River just before it enters the sea at Killiney Bay.

The Glencullen River rises on Glendoo Mountain in Dún Laoghaire-Rathdown and flows to the south east through Glencullen before entering County Wicklow where it merges with the Dargle River which flows into the sea at Bray.

The Little Dargle River also rises in Three Rock Mountain. It flows to the north through Ballinteer where it merges with another stream. It continues to flow to the north where it merges with the Dodder at Rathfarnham, in the north west of the Plan area.

The River Dodder rises in the Dublin Mountains and in its upper reaches it forms a reservoir system which is an integral part of the water supply to Dublin. It flows down through Tallaght, Rathfarnham, Donnybrook and Ballsbridge before discharging into the Liffey Estuary at Ringsend. The lower section of the river is tidal up to Ballsbridge.

Dún Laoghaire-Rathdown includes parts of three Water Management Units: the Dargle; the Dodder; and Shanganagh. Figure 4.8 shows the boundaries of these Water Management Units.

The Zone of Influence with respect to water resources can be estimated to be all WMUs either wholly within or partially within the County, connected WMUs, connected estuarine and coastal water bodies and all connecting bodies of groundwater.

4.6.3.2 WFD Surface Water Status

The WFD defines 'surface water status' as the general expression of the status of a body of surface water, determined by the poorer of its ecological status and its chemical status. Thus, to achieve 'good surface water status' both the ecological status and the chemical status of a surface water body need to be at least 'good'.

Ecological status is an expression of the structure and functioning of aquatic ecosystems associated with surface waters. Such waters are classified as of 'good ecological status' when they meet Directive requirements.

Chemical Status is a pass/fail assignment with a failure defined by a face-value exceedance of an Environmental Quality Standards (EQS) for one or more Priority Action Substances (PAS) listed in Annex X of the Water Framework Directive (WFD). The EQS values for individual PAS substances are set at European level. Good surface water chemical status means that concentrations of pollutants in the water body do not exceed the environmental limit values specified in the Directive.

Figure 4.12 illustrates currently available from the EPA on the status of rivers within and surrounding the Plan area. These status classifications are contributed towards by the morphological pressures found along these often urban waterbodies such as culverts, river straightening and bed/bank reinforcement.

The River Dodder is identified as being of *poor* status along the northern boundary of the Plan area.

The Glencullen River is identified as being of *good* status in the south of the Plan area.

The Carrickmines Stream is identified as being of *moderate* status before it joins the Loughlinstown (or Shanganagh) River at Loughlinstown. The Loughlinstown River is identified as being of *good* status upstream of Loughlinstown and of *poor* status downstream

of Loughlinstown, after it joins with the Carrickmines Stream.

Figure 4.13 illustrates currently available from the EPA on the status of coastal waters within and surrounding the Plan area.

Coastal waters are generally of *moderate* status to the north of Sorrento Point and *high* status to the south of Sorrento Point. The *moderate* status to the north of Sorrento Point is contributed towards by the morphological pressures found along this urban coastline including built structures, port tonnage and coastal defences. An area to the east of Sorrento Point is not monitored.

4.6.3.3 Quality of Rivers

River water quality within the County is monitored by the EPA at a number of locations. *Good* status as defined by the WFD equates to approximately *Q4* in the national biological classification scheme of rivers as set out by the EPA.

Figure 4.14 maps the most recent Q-value data (post 2010) for various monitoring locations within the County.

The Dodder River in the north of the Plan area at Miltown is indicated as being of *moderate* status (*Q3-4*).

The Glencullen River in the south of the Plan area at Boranaraltry is indicated as being of *high* status (*Q4-5, Q5*).

The Carrickmines Stream is indicated as being of *moderate* status (*Q3-4*) before it joins the Loughlinstown (or Shanganagh) River at Loughlinstown. The Loughlinstown River is indicated as being of *good* status (Q4) both upstream and downstream of Loughlinstown. The Kill-O-The-Grange Stream which flows into the Loughlinstown River south of Ballybrack is indicated in two locations as being of *poor* status (Q2-3, Q3).

4.6.3.4 Quality of Coastal and Bathing Waters

The Assessment of Trophic Status of Estuaries and Bays in Ireland (ATSEBI) System is used by the EPA in order to classify the quality status of transitional waters. Good status for coastal waters as defined by the WFD equates to approximately *Unpolluted* status in the Assessment of Trophic Status of Estuaries and Bays in Ireland (ATSEBI).

Figure 4.15 maps coastal water quality adjacent to the County. All Coastal Waters are classified as being *Unpolluted* – they do not breach any of the criteria.

Mandatory and Guide Values are set out for bathing waters in the 2006 EU Bathing Water Directive and transposing Regulations. Mandatory Values are values which must be observed if the bathing area is to be deemed compliant with the Directive. Compliance with Guide Values exceeds guidance with Mandatory Values and can be regarded as quality objectives which bathing sites should endeavour to achieve. Quality of bathing water in the Plan area is classified for years with available data from 2010 on Table 4.2. All bathing waters have complied with the Mandatory Values during this period.

Table 4.2 Bathing Water Quality by Year

	Merrion Strand	Seapoint	Killiney	Bray
2013	Mandatory Values	Guide Values	Guide Values	Mandatory Values
2012	Mandatory Values	Guide Values	Guide Values	Mandatory Values
2011	Guide Values	Guide Values	Guide Values	Guide Values
2010	Guide Values	Guide Values	Guide Values	Mandatory Values

Source: EPA Bathing Water Quality (Various)

4.6.4 Ground Water

4.6.4.1 Introduction

Groundwater is stored in the void spaces in underground layers of rock, or aquifers. These aquifers are permeable, allowing both the infiltration of water from the soils above them and the yielding of water to surface and coastal waters. Groundwater is the part of the subsurface water that is in the saturated zone - the zone below the water table, the uppermost level of saturation in an aquifer at which the pressure is atmospheric, in which all pores and fissures are full of water.

4.6.4.2 WFD Groundwater Status

For groundwater bodies, the approach to classification is different from that for surface water. For each body of groundwater, both the chemical status and the quantitative must be determined. Both have to be classed as either *good* or *poor*. The WFD sets out a series of criteria that must be met for a body to be classed as good chemical and quantitative status. The EPA has classified groundwater

status in Dún Laoghaire-Rathdown as *good* as shown on Figure 4.16.

Given the urban nature of the County and the range of land use activities which have taken place historically, soils have been contaminated in the past. Such contamination has the potential to affect water quality, biodiversity and flora and fauna and human health. The County Development Plan requires that where brownfield redevelopment is proposed, adequate and appropriate investigations are carried out (through the Development Management process) into the nature and extent of any soil and groundwater contamination and the risks associated with site development work.

4.6.4.3 Groundwater Productivity and Vulnerability

The Geological Survey of Ireland (GSI) rates groundwaters according to both their productivity and vulnerability to pollution.

Groundwater Vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. Groundwater vulnerability maps are based on the type and thicknesses of subsoils (sands, gravels, glacial tills (or boulder clays), peat, lake and alluvial silts and clays), and the presence of karst features. Groundwater is most at risk where the subsoils are absent or thin and, in areas of karstic limestone, where surface streams sink underground at swallow holes[7].

Figure 4.17 maps groundwater vulnerability for the County. Much of the plan area is classified as being of high vulnerability with certain areas varying from low to extreme vulnerability.

Groundwater Productivity rates the value of the groundwater resource. Ireland's entire land surface is divided into nine aquifer categories. The Plan area is divided into two main classifications as seen on Figure 4.18. The north west and south east portions of the Plan area are underlain by a locally important sand/gravel aquifers this aquifer is capable of yielding enough water to boreholes or springs to supply villages, small towns or factories. The remainder of the Plan area is underlain by poor bedrock aquifers, which are generally unproductive except for local zones.

[7] Source: Geological Survey of Ireland (2014) Metadata

4.6.5 WFD Registers of Protected Areas

The WFD requires that Registers of Protected Areas (RPAs) are compiled for a number of water bodies or part of water bodies which must have extra controls on their quality by virtue of how their waters are used by people and by wildlife.

The WFD requires that these RPAs contain: areas from which waters are taken for public or private water supply schemes; designated shellfish production areas; bathing waters; areas which are affected by high levels of substances most commonly found in fertilizers, animal and human wastes - these areas are considered nutrient sensitive; areas designated for the protection of habitats or species e.g. Salmonid areas; Special Areas of Conservation (SACs); and, Special Protection Areas (SPAs).

The waters listed on the RPA are listed on and are mapped on Figure 4.19.

Table 4.3 Entries to the Registers of Protected Areas

Qualifying Value	Water Body
RPA Species SPA	Sandymount Strand/Tolka Estuary
RPA Habitat Rivers	Dargle (River)
RPA Drinking Water Rivers	Loughlinstown (River)
RPA Beaches	Seapoint
RPA Beaches	Killiney
RPA Beaches	Sandymount Strand
RPA Beaches	Merrion Strand
RPA Drinking Water Ground Water	All underlying GW

4.6.6 Flooding

Appendix 13 to the County Development Plan contains the findings of a Strategic Flood Risk Assessment (SFRA) which has been undertaken by the Council in response to requirements contained in *The Planning System and Flood Risk Management*

Guidelines for Planning Authorities (DEHLG/OPW, 2009).

The purpose of the SFRA is to provide sufficient information to allow sound planning decisions to be made on sites at risk of flooding over the lifetime of the Plan and also to ensure that Elected Members have the necessary information in coming to decisions on the Plan with respect to flood risk and its management.

Flooding is an environmental phenomenon which, as well have causing economic and social impacts, could in certain circumstances pose a risk to human health. The existence of flood risk within the County is illustrated by the mapping of locations of the most significant recent flooding events - accessible from the Office of Public Works (OPW) National Flood Hazard Mapping website - which is provided at Figure 4.20.

The OPW is the lead Authority on flooding in the Country and in 2011 they commenced a National CFRAM programme. CFRAM studies are currently being carried out for the Eastern Region - which includes Dún Laoghaire-Rathdown - and these studies have been used as the basis of the Strategic Flood Risk Assessment. The Eastern CFRAM studies are still being finalised. The Dodder River, which forms part of the Eastern Region CFRAM, was, however the subject of an earlier pilot project and the maps in relation to the Dodder CFRAM are consequently in the public domain. At a meeting with the OPW and the Department of Environment, Community and Local Government in February 2014 Dún Laoghaire-Rathdown were advised to progress with the SFRA using the information that was available. The SFRA undertaken was progressed on this basis using maps dating from June 2014. The Council are still liaising with the OPW (as part of the ongoing CFRAM Study process) on a number of specific areas, which have been shown to be subject to flooding.

The SFRA contains detailed mapping of certain areas which are subject to elevated levels of flood risk, including for areas at Dundrum, Shankill and Old Conna. These maps, in their current form, remain subject to an unknown amount of change before they can be robustly relied upon for any decision making processes.

4.6.7 Existing Problems

Subject to exemptions provided for by Article 4 of the WFD[8], based on available water data, certain surface water bodies within the County will need improvement in order to comply with the objectives of the WFD:

- The River Dodder is identified as being of *poor* status along the northern boundary of the Plan area. In the north of the Plan area at Miltown it is indicated as being of *moderate* status (*Q3-4*).
- The Carrickmines Stream is identified as being of *moderate* status (*Q3-4*) before it joins the Loughlinstown (or Shanganagh) River at Loughlinstown.
- The Loughlinstown River is identified as being of *poor* status downstream of Loughlinstown, after it joins with the Carrickmines Stream.
- The Kill-O-The-Grange Stream which flows into the Loughlinstown River south of Ballybrack is indicated in two locations as being of *poor* status (Q2-3, Q3).

Note that these classifications in the County are contributed towards by the morphological pressures found along these often urban waterbodies such as culverts, river straightening and bed/bank reinforcement.

- Coastal waters are generally of *moderate* status to the north of Sorrento Point.

Note that this *moderate* status classification is contributed towards by the morphological pressures found along this urban coastline including built structures, port tonnage and coastal defences.

The Eastern RBD Management Plan and associated Programme of Measures include provisions to help ensure that these water bodies meet the objectives of the WFD. The Plan will contribute towards the achievement of the objectives of this Management Plan.

There is historic and predictive evidence of flooding in various locations across the

[8] Article 4 of the WFD sets out various exemptions for deterioration in status caused as a result of certain physical modifications to water bodies. This is provided: all practicable mitigation measures are taken; there are reasons of overriding public interest or the benefits to human health, safety or sustainable development outweigh the benefits in achieving the WFD objective; there are no better alternatives; and the reasons for the physical modification are explained in the relevant river basin management plan.

County. All recommendations made by the SEA and SFRA in relation to flooding risk management have been integrated into the Plan.

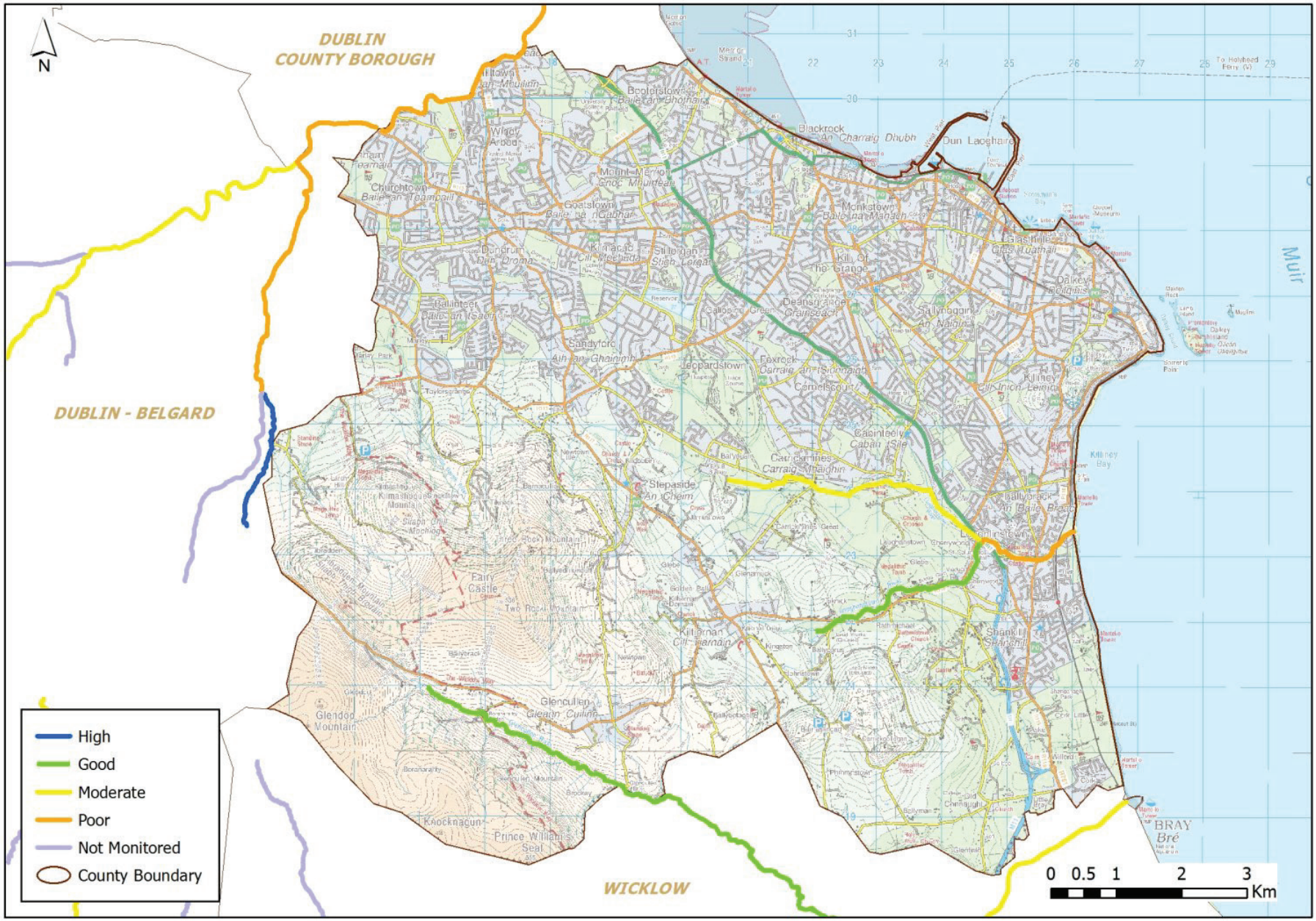

Figure 4.12 Status of Rivers
Source: EPA (2011)

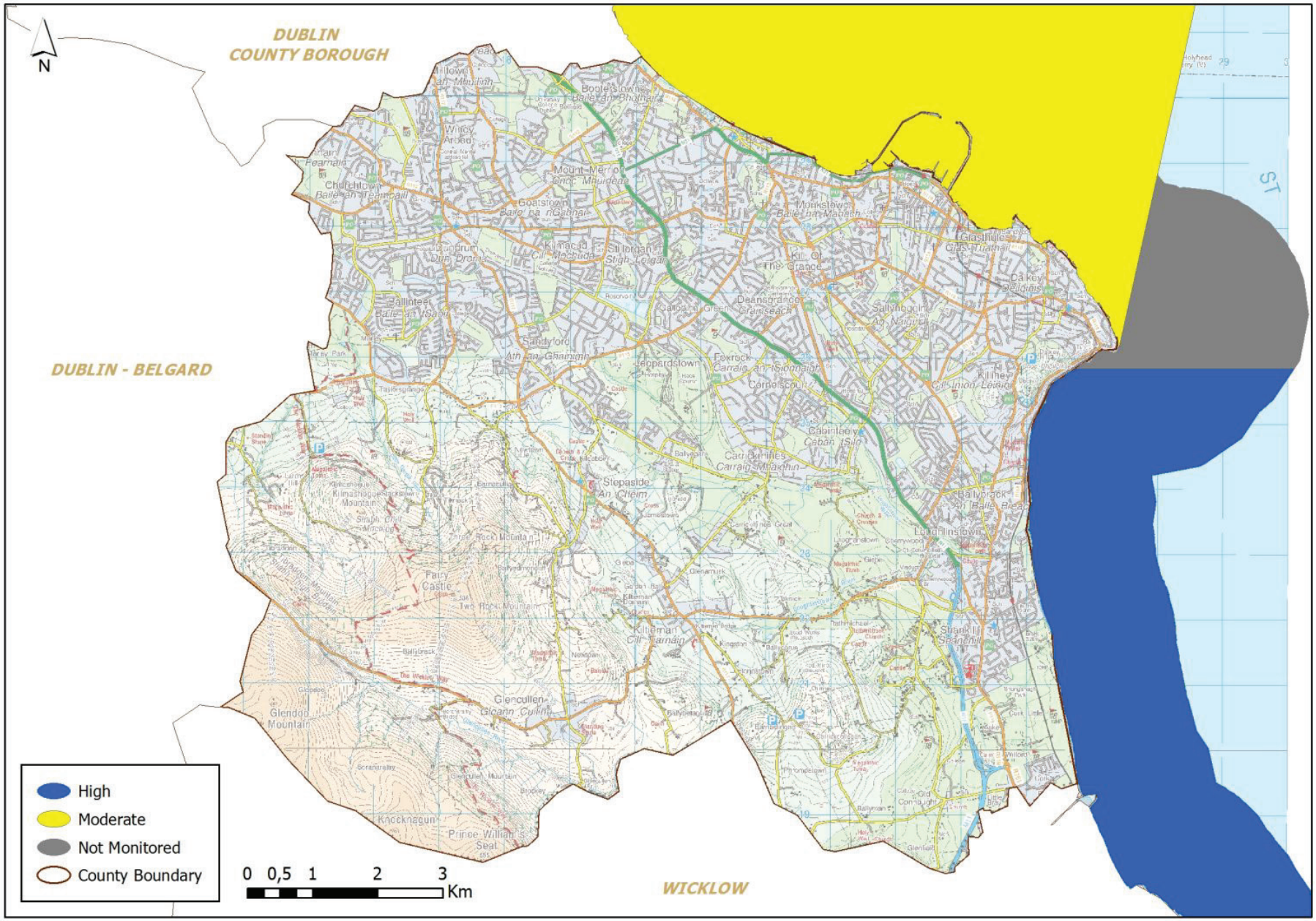

Figure 4.13 Status of Coastal Waters
Source: EPA (2011)

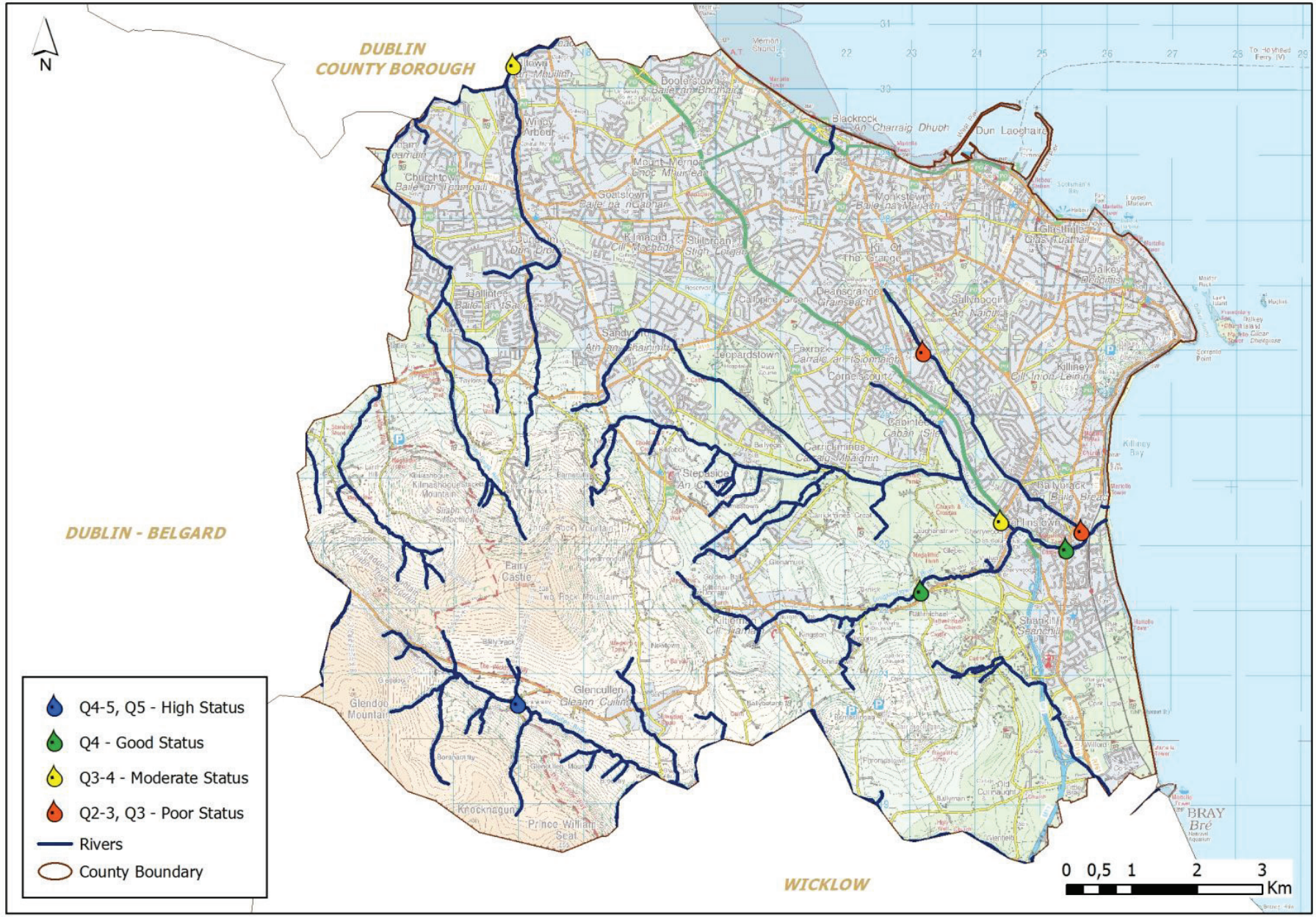

Figure 4.14 Q-Values (Biotic Index Ratings) at Points on Rivers
Source: EPA (various post 2010)

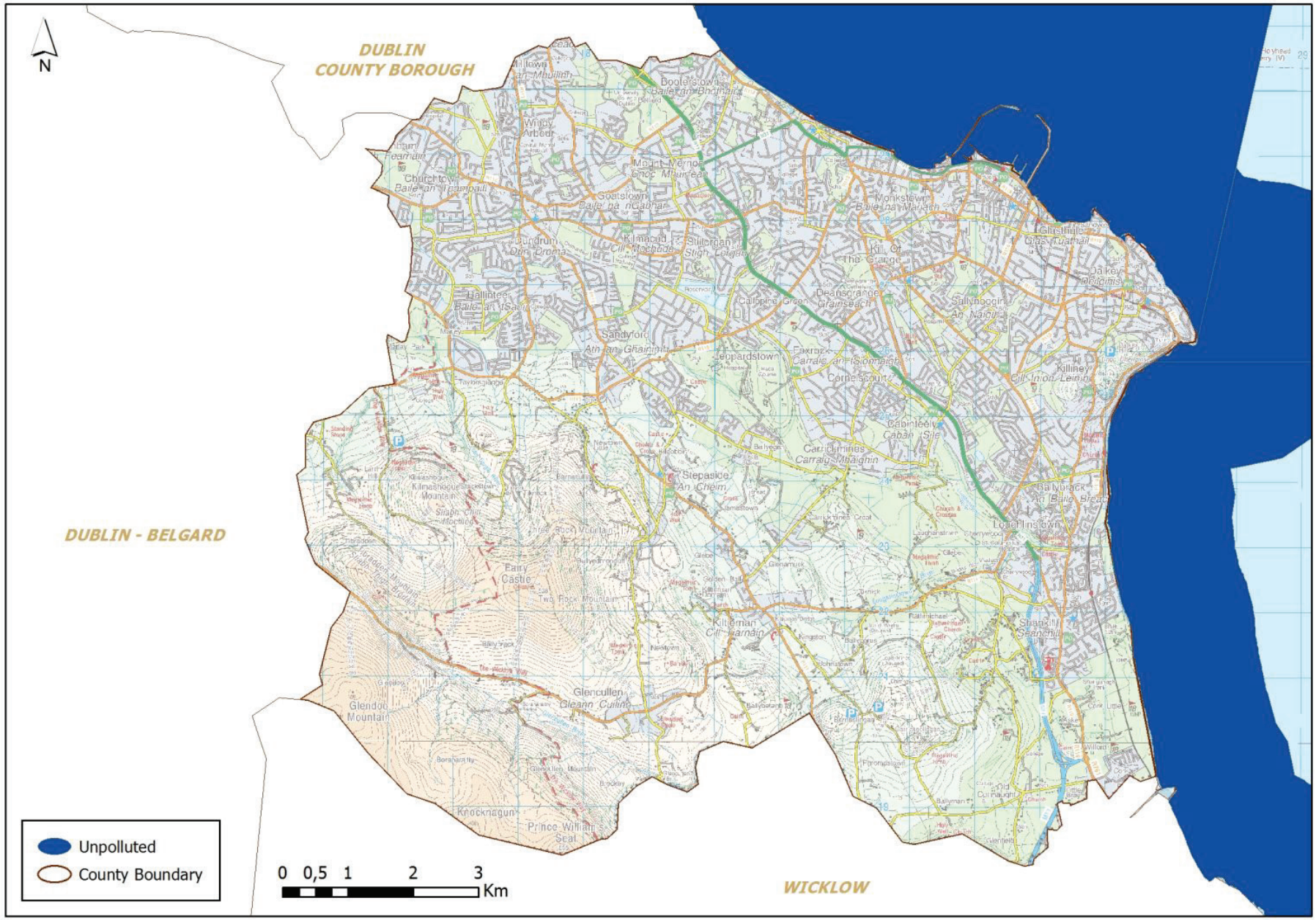

Figure 4.15 Coastal Water Quality
Source: EPA (2007-2009)

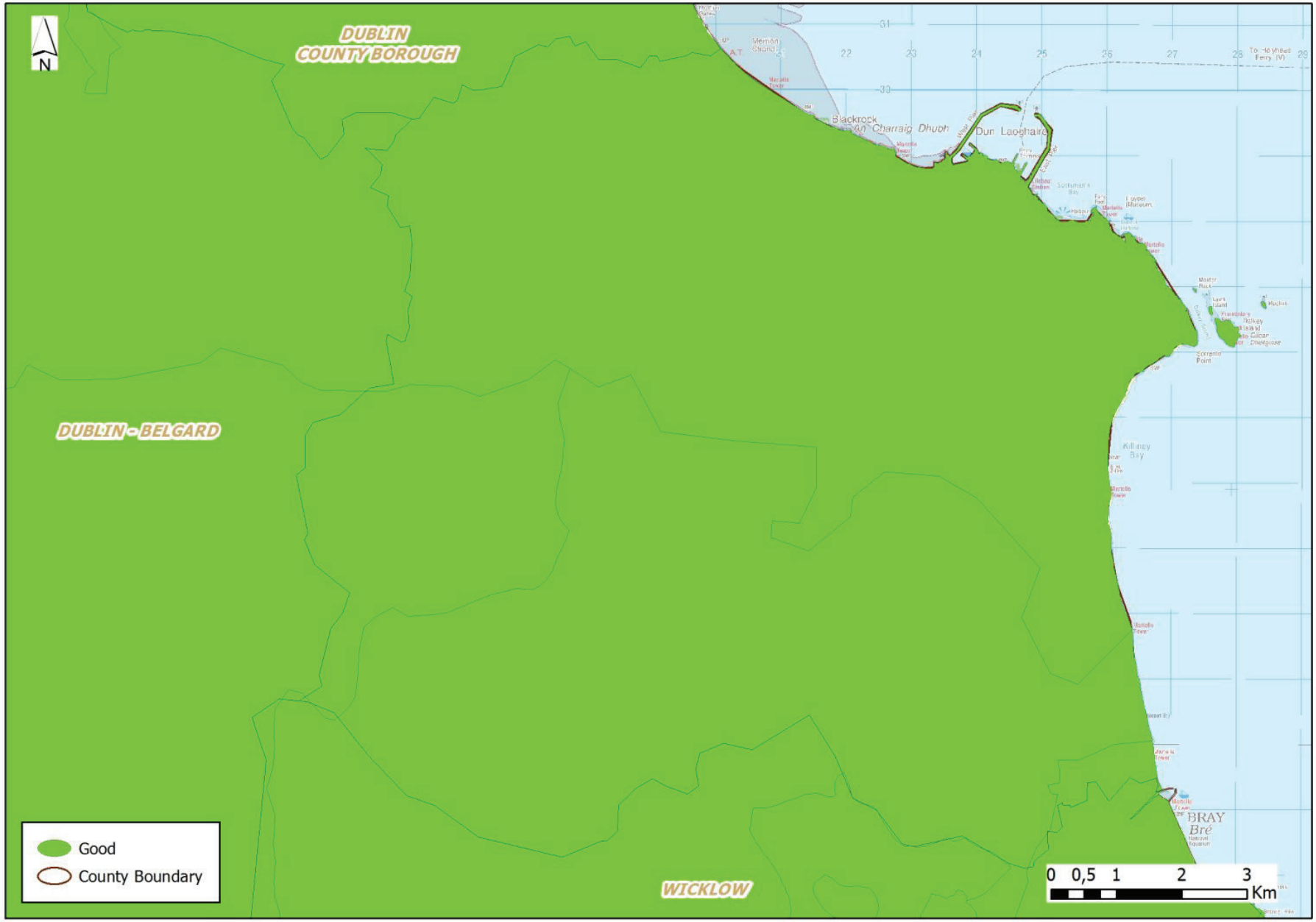

Figure 4.16 Groundwater Status
Source: EPA (2011)

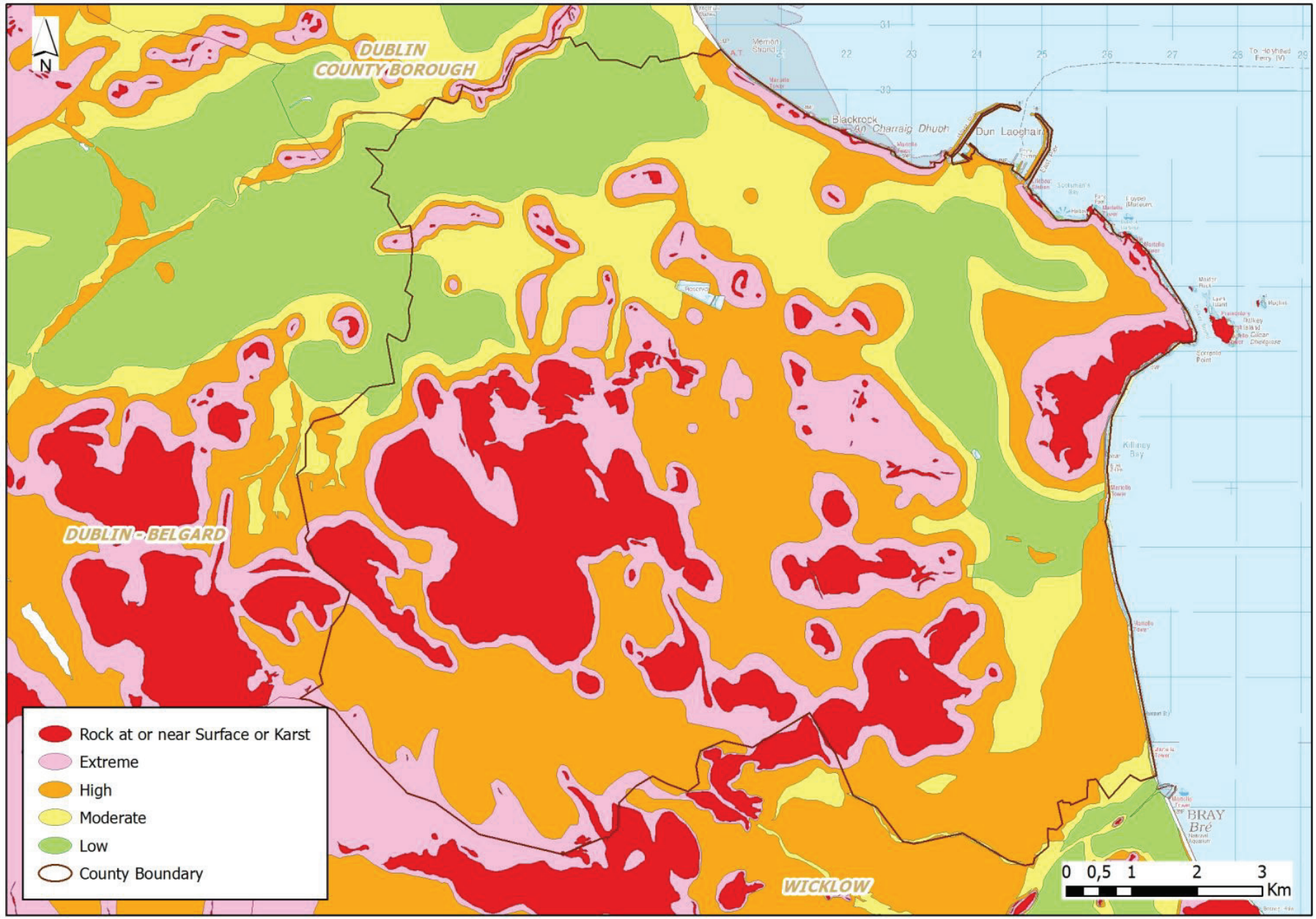

Figure 4.17 Groundwater Vulnerability
Source: GSI (2006)

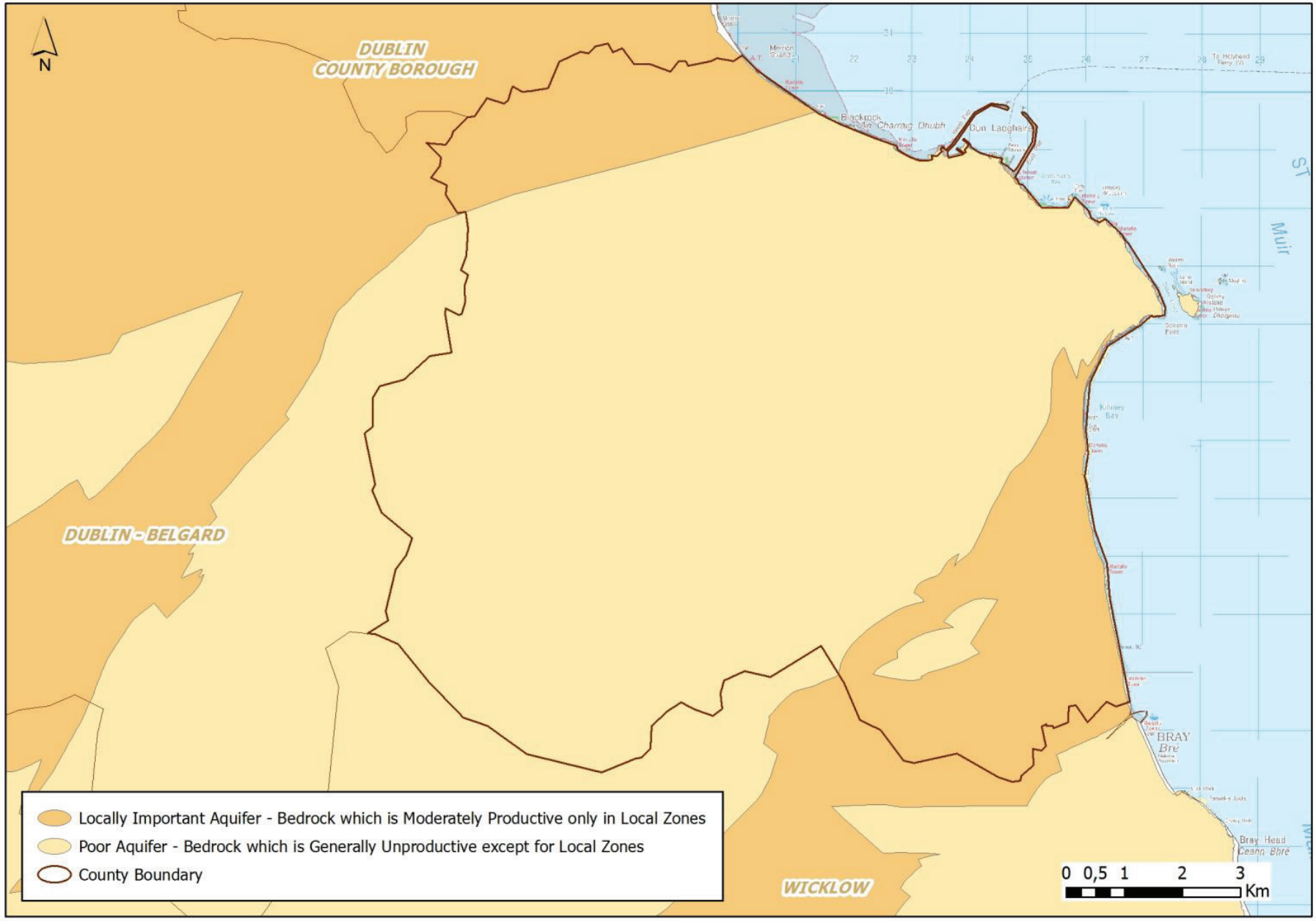

Figure 4.18 Groundwater Productivity
Source: GSI (2006)

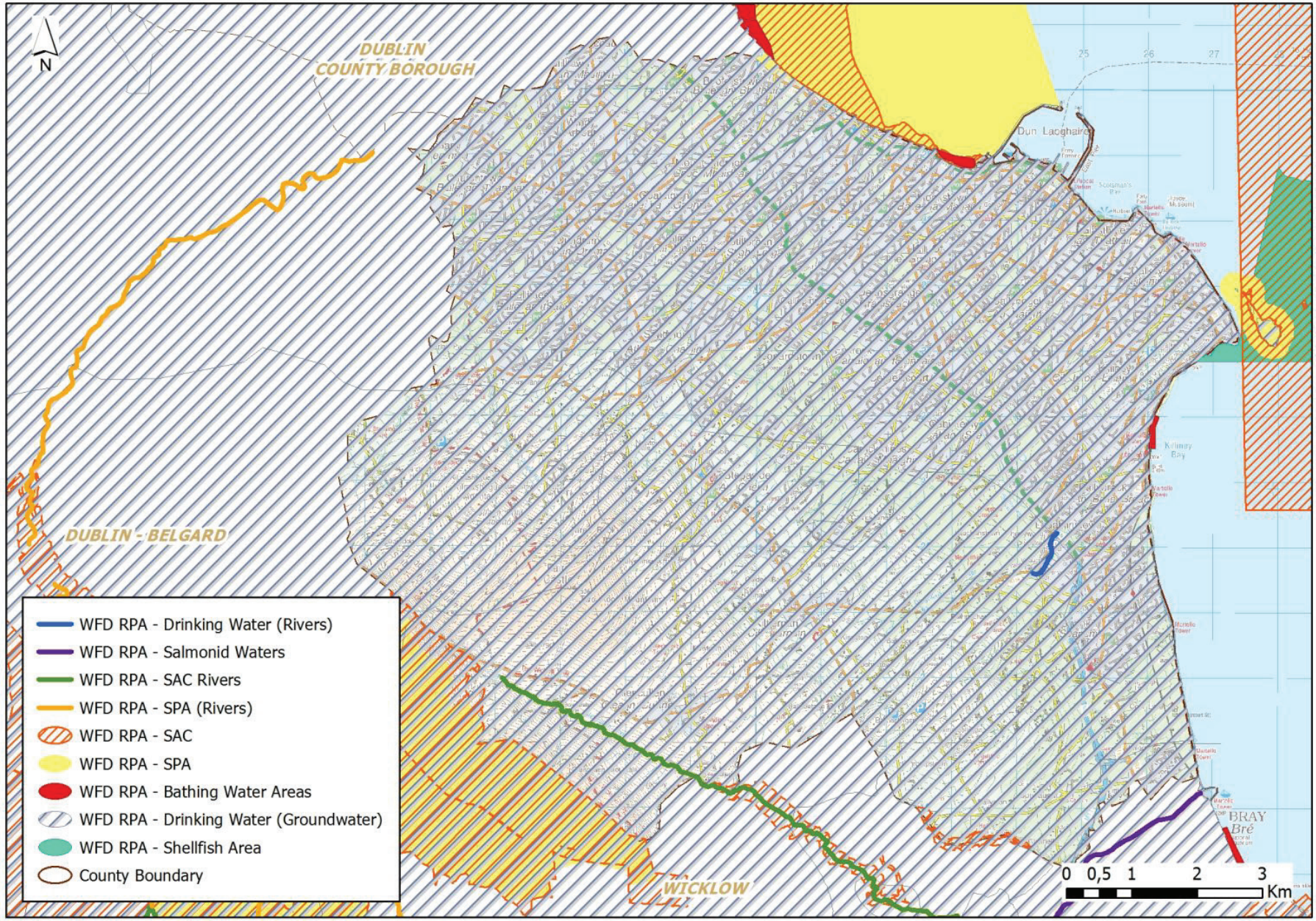

Figure 4.19 Entries to the WFD Registers of Protected Areas
Source: EPA (2011)

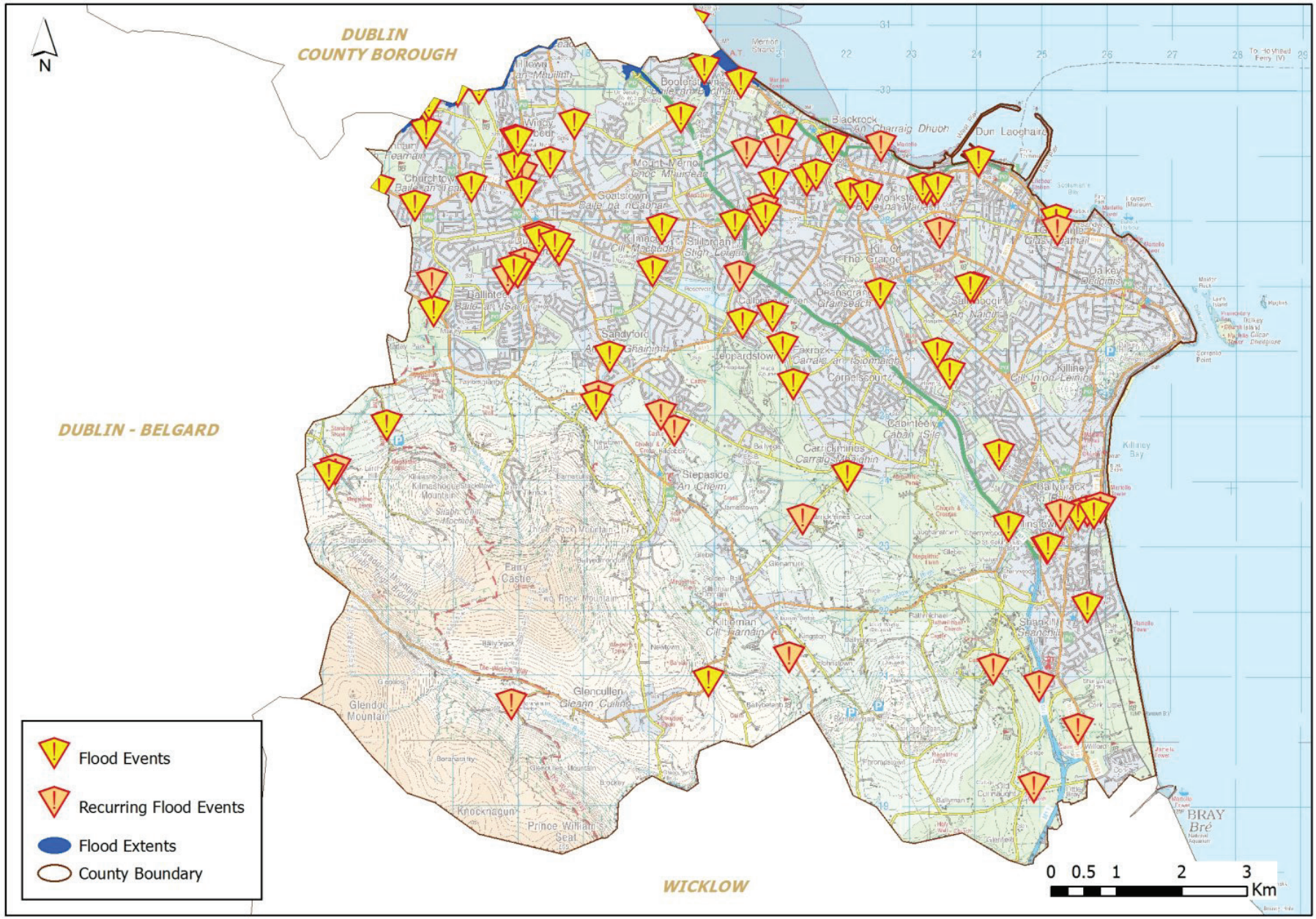

Figure 4.20 OPW Flood Events
Source: OPW (various)

4.7 Air and Climatic Factors

4.7.1 Ambient Air Quality

4.7.1.1 Introduction and Legislation

In order to protect human health, vegetation and ecosystems, EU Directives set down air quality standards in Ireland and the other Member States for a wide variety of pollutants. These pollutants are generated through fuel combustion, in space heating, traffic, electricity generation and industry and, in sufficient amounts, could affect the well-being of the areas inhabitants. The EU Directives include details regarding how ambient air quality should be monitored, assessed and managed.

The principles to this European approach are set out under the Air Quality Framework Directive 1996 as transposed into Irish law under the Environmental Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999 (SI No. 33 of 1999).

Four daughter Directives lay down limits or thresholds for specific pollutants. The first two of these directives cover: sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead; and, carbon monoxide and benzene. Two more daughter directives deal with: ozone; and polyaromatic hydrocarbons, arsenic, nickel, cadmium and mercury in ambient air.

4.7.1.2 Air Zones

In order to comply with the directives mentioned above, the EPA measures the levels of a number of atmospheric pollutants. For the purposes of monitoring in Ireland, four zones are defined in the Air Quality Standards Regulations 2002 (SI No. 271 of 2002). The main areas defined in each zone are:

- Zone A: Dublin Conurbation.
- Zone B: Cork Conurbation.
- Zone C: 21 Other cities and large towns including Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee and Dundalk.
- Zone D: Rural Ireland, i.e. the remainder of the State - small towns and rural areas of the country - excluding Zones A, B and C.

Dún Laoghaire-Rathdown falls into zone A. Current air quality in Zone A is "good".

4.7.1.3 Current Monitoring Sites

There are three current air quality monitoring sites in Dún Laoghaire-Rathdown.

The site on the Glenegeary Road in Dún Laoghaire measures oxides of nitrogen. This site is operated by Fingal County Council on behalf of Dún Laoghaire-Rathdown County Council. Monitoring is done using continuous monitors for nitrogen oxides. Emissions from traffic are the main source of nitrogen oxides in Ireland along with electricity generating stations and industry. Levels in Ireland are moderate but have increased due to the growth in traffic numbers.

The site at the EPA Inspectorate, Richview, Clonskeagh monitors ozone levels. Monitoring is carried out using a continuous monitor for ozone. Ozone is a natural component of the atmosphere. Most ozone is found in the stratosphere, between 12km and 50km above sea level, and in the troposphere, just above the surface of the Earth. Levels of ozone in Ireland are moderate.

The site at Rosemount, Dublin commenced monitoring for metal concentrations including lead, nickel, arsenic and cadmium in 2009. The metals deposition sampler is located on the grounds of University College Dublin, Dublin 14. Lead, arsenic, cadmium, nickel and mercury are toxic heavy metals which can be found in the air. They impact on health through inhalation of particulate matter (PM10) containing the metals or, in the case of mercury, direct inhalation of vapour. Their sources are primarily fossil fuel combustion, industrial processes such as metal-plating, mining, smelting, the production of batteries, plastics and pigments and other sources[9].

The EPA operates an Air Quality for Health Index (AQIH). This is a number from 1 to 10 that indicate what air quality currently in any given region and whether it might affect health. The index is calculated based on the latest available measurements of PM10, sulphur dioxide, nitrogen dioxide and ozone in Zone A.

[9] EPA (2012) *Air Quality in Ireland 2011*

The EPA's (2015) Air Quality in Ireland 2014 identifies that, overall, air quality in Ireland compares favourably with other EU Member States and continues to be of good quality relative to other EU countries.

4.7.2 Climatic Factors

The key issue involving the assessment of the effects of implementing the plan on climatic factors relates to greenhouse gas emissions arising from transport. It is noted that the Plan contains a number of actions which respond to potential threats to environmental components arising from a changing climate.

Flooding - see Section 4.6.6 - is influenced by climatic factors and the implications of climate change with regard to flood risk have been integrated into the recommendations which have been inserted into the Plan. There are emerging objectives relating to climate adaptation and there is likely to be future Guidance for climate change proofing of land use plan provisions as is flagged in the National Climate Change Adaptation Framework (DECLG, 2012). Some of these objectives might relate to green infrastructure which can achieve synergies with regard to the following:

- Provision of open space amenities;
- Sustainable management of water;
- Protection and management of biodiversity;
- Protection of cultural heritage; and
- Protection of protected landscape sensitivities.

Ireland's emissions profile has changed considerably since 1990, with the contribution from transport more than doubling and the share from agriculture reducing since 1998. Travel is a source of:

1. Noise;
2. Air emissions; and
3. Energy use (39% of Total Final Energy Consumption in Ireland in 2012 was taken up by transport, the largest take up of any sector)[10].

Land-use planning contributes to what number and what extent of journeys occur. By addressing journey time through land use planning and providing more sustainable modes and levels of mobility, noise and other emissions to air and energy use can be minimised. Furthermore, by concentrating populations, greenfield development - and its associated impacts - can be minimised and the cost of service provision can be reduced.

Between 2008 and 2011, Ireland's greenhouse gas emissions decreased across all sectors due to the effects of the economic downturn with emissions falling by 15.2% between 2008 and 2011. However, 2012 saw emissions rise by 1.2% when compared with 2011[11].

Maximising sustainable mobility will help Ireland meet its emission target for greenhouse gases under the 2020 EU Effort Sharing target which commits Ireland to reducing emissions from those sectors that are not covered by the Emissions Trading Scheme (e.g. transport, agriculture, residential) to 20% below 2005 levels.

4.7.3 Existing Problems

Legislative objectives governing air and climatic factors in Dún Laoghaire-Rathdown were not identified as being conflicted with.

4.8 Material Assets[12]

4.8.1 Water Services

4.8.1.1 Irish Water

Since January 2014 Dún Laoghaire-Rathdown County Council no longer has any direct control in relation to the provision of water or waste water services. The delivery, integration and implementation of strategic water and waste water projects and infrastructural improvements are now the responsibility of the newly established State body 'Irish Water'. The Council commit to working closely with Irish Water to ensure that the Plan continues to align with both the National Spatial Strategy and the Regional Planning Guidelines and that the provision of water/waste water services will not be a limiting factor in terms of forecasted growth.

The function and role of Irish Water includes:

- Abstracting and treating water;

[10] Sustainable Energy Ireland (2014) *Energy in Ireland 1990 – 2012*

[11] EPA (2014) Ireland's Greenhouse Gas Emissions in 2012

[12] Much of the text in this section is taken from the Plan

- Delivering water and waste water services to homes and businesses;
- Installing water meters and billing domestic and business customers;
- Raising finance to fund improvements and repairs in the water system; and
- Maintaining and operating the water system.

The upgrading of the infrastructure will contribute towards compliance with the Water Framework Directive, EU Urban Waste Water Treatment Directive and Drinking Water Regulations and will help to protect human health and maintain the quality of coastal waters.

4.8.1.2 Water Services: Recent Achievements and Challenges

Since 2010, significant progress has been made in the delivery of water services infrastructure serving the County including:

- The opening of the Shanganagh waste water treatment works[13] which is key to unlocking much of the, as yet unrealised, development potential of the southern part of the County (and north County Wicklow);
- The opening of the Sandyford High Level Water Supply Scheme; and
- The completion of the Glencullen water supply and improvement scheme.

The overall water supply and waste water situation for the whole Greater Dublin Area (GDA) is critical and is almost certain to become more so in the short term. Water services in the GDA came under severe pressure from the population and economic growth experienced in the region and has been a serious issue of concern since the early 1990s. The speed of change and pace of development experienced previously, in both the wider Dublin Region and within Dún Laoghaire-Rathdown has placed stresses and pressures on the water supply and waste water infrastructure of the County.

[13] The Shanganagh waste water treatment works provides full secondary treatment for waste water from Shanganagh and Bray. The new plant, constructed at the site of an aging waste water treatment works, has the capacity to treat effluent from 186,000 population equivalent (p.e) with the potential to increase capacity to 248,000p.e in the future.

The Old Connaught/Woodbrook Water and Sewerage Schemes - which are absolutely critical to servicing the south of the County (and north Wicklow) - have not been progressed and there are as a consequence still major water and waste water infrastructural shortcomings in the south of the County. The Council continues to work with Irish Water to address the region's water and waste water infrastructural shortcomings in the south of the County to ensure the development potential of the major growth cores at Old Conna, Woodbrook, Shanganagh, Rathmichael and Fassaroe (County Wicklow) are 'unlocked' and realised. The development of these growth centres are fully aligned with, and listed in the Regional Planning Guidelines (RPGs). However, neither the settlement strategy nor the economic strategy as detailed - for these areas -within the RPGs can be delivered without the required water and waste water services infrastructure.

4.8.1.3 Waste Water Infrastructure

Waste water arising from Dún Laoghaire-Rathdown is generally collected by the waste water collection network and pumped to one of two waste water treatment plants, either: for the south of the County, Shanganagh (where the waste water undergoes secondary treatment); or, for some catchments in the north of the County such as Dodder Valley and UCD, Ringsend (where the waste water undergoes tertiary treatment).

Some areas away from the main settlement areas are unserviced, with development using septic tanks. According to the 2011 census, this represents 0.7% of households in the County compared to almost 25% nationally. There are 578 'one-off' houses in the County - 'one-off' houses are described as occupied detached houses with individual sewerage systems. The impact of individual sewerage systems on the environment has consequently not been identified as a major problem. However, maintenance of these systems is important. The Septic Tank Registration and Inspection System will be of benefit in ensuring maintenance and reducing risks posed by malfunctioning systems.

4.8.1.4 Waste Water Infrastructure Capacity, Demand and Performance

The Shanganagh Waste Water Treatment Plant (Reg. No. D0038-01) is the only treatment plant in the County's administrative

area. It provides full secondary treatment for waste water from Shanganagh and Bray. The new plant, constructed at the site of an aging waste water treatment works, has the capacity to treat effluent from 186,000 population equivalent (p.e.) with the potential to increase capacity to 248,000 p.e. by 2022.

The current (2015) plant loading is 105,000 p.e. The current population served by the plant is 65,000 p.e. from Dún Laoghaire-Rathdown's administrative area and 40,000 p.e. from the Bray Town Council administrative area. The plant has enough spare capacity for 81,000 p.e..

Waste water performance information published by the EPA[14] identified that the Shanganagh waste water treatment plant passed all mandatory Waste Water Treatment Directive related requirements during 2014.

The Dublin City Council operated Ringsend waste water treatment plant provides secondary and tertiary treatment. The current (2015) population being served by the Ringsend plant is 1,110,000. The current effluent capacity at Ringsend is 1,640,000 and the current plant loading is 1,760,000 p.e.. This leaves a current shortfall of 120,000 p.e.

The waste water treatment plant in Ringsend failed to meet mandatory Waste Water Treatment Directive related quality standards for phosphorus and nitrogen set in the Directive during 2014[15].

4.8.1.5 Drinking Water Supply, Capacity and Demand

Over 98% of water distributed in Dún Laoghaire-Rathdown is supplied from Dublin City Council. This water is sourced from catchments outside Dún Laoghaire-Rathdown County Council, primarily Roundwood (Vartry), Ballymore Eustace (Liffey) and Ballyboden (Dodder).

Total daily demand in the Dún Laoghaire-Rathdown County area is approximately 51 mega litres (11 million gallons) per day.

Dún Laoghaire-Rathdown County Council is part of the Greater Dublin Water Supply Area which has less than 2% available capacity. Water production capacity in the Dublin region is barely adequate and is currently unable to meet demand in the event of adverse weather cycles or significant system failure. Irish Water plans to invest in strategic capital upgrades and linkages between the existing supply sources and will review options for new supplies over the coming years.

There are three small surface water (river/ stream/groundwater) abstraction points in Kilternan, Glencullen and Ballyedmonduff serving a population of c. 3,800 p.e. with a total daily demand of approximately 560 m^3. Both Kilternan and most of the supply area for Ballyedmonduff are connected to the main water distribution network. Glencullen is presently an independent supply but plans are in place to connect to the main distribution network. Therefore, none of the supplies will be independent once this work has been completed.

4.8.1.6 Drinking Water Quality

Drinking water must be clean and wholesome. That means it must meet the relevant water quality standards and must not contain any other substance or micro-organism in concentrations or numbers that constitute a potential danger to human health.

Compliance with the drinking water requirements is determined by comparing the results of analyses submitted by water suppliers to the standard for 48 parameters specified in the European Communities (Drinking Water) Regulations (No. 2), 2007. To ensure that these standards are met, each water supply must be monitored on a regular basis.

Under Section 58 of the Environmental Protection Agency Act 1992 the EPA is required to collect and verify monitoring results for all water supplies in Ireland covered by the European Communities (Drinking Water) Regulations, 2000. The EPA publishes their results in annual reports which are supported by Remedial Action Lists (RALs). The RAL identifies water supplies which are not in compliance with the Regulations mentioned above.

The EPA's 'The Provision and Quality of Drinking Water in Ireland' (EPA, 2012) Reports identify that microbiological compliance levels in Public Water Supplies in Dún Laoghaire-Rathdown were 100% in both 2011 and 2012.

[14] EPA (2015) *Focus on Urban Waste Water Treatment in 2014*
[15] EPA (2015) *Focus on Urban Waste Water Treatment in 2014*

Chemical compliance levels decreased from 100% in 2011 to 99.7% in 2012.

The most recent EPA Remedial Action List (Q4 of 2015) identified one water supply within the County (Roundwood) in need of improvement with respect to treatment and management issues. The Remedial Action List identifies "Replacement of Callow Hill Tunnel, use of covered storage reservoir and upgrade of disinfection system" for solving these issues.

4.8.2 Waste Management

The total collected and brought household waste in Dún Laoghaire-Rathdown in 2012 amounted to 66,453(t). This is a reduction on 2011 figures where 66,707 (t) was collected and brought.[16]

The Government recently adopted a new approach to waste management through a document called 'A Resource Opportunity – Waste Management Policy in Ireland' published in July 2012. This policy provides a roadmap on how Ireland will move away from an over dependence on landfill, by putting in place the most appropriate technologies and approaches to reduce waste, while at the same time maximising the resources that can be recovered from waste.

The policy is predicated on five principles those being prevention and minimisation, reuse, recycling, recovery and disposal.

The Plan commits the Council to continue to work in tandem with EU and National policy and the Environmental Protection Agency in the implementation and execution of its waste management responsibilities and duties throughout the duration of the life time of the Plan.

A new Regional Waste Management Plan for the Eastern and Midlands Region was adopted in 2015.

The County currently has no landfill site or any active waste treatment facilities in its functional area. Hence, the vast bulk of waste that arises in the County is collected locally by private waste companies and transferred to facilities outside the County at Kill and KTK Landfill at Kilcullen, Co. Kildare.

Occasionally a time-limited or volume-limited waste permit is granted to a landowner for the acceptance of waste material suitable for land reclamation purposes. Such waste is classed as inert e.g. soil and/rock and may be sourced within or outside Dún Laoghaire-Rathdown. Additionally home composting of organic waste is also encouraged.

Ballyogan Landfill (EPA Licence no. W0015-01) was decommissioned in 2005. Remediation works at the old Ballyogan landfill site have been completed. The Waste Transfer Facility at the site also ceased operation in 2009. Plans for a regional scale public park at the site exist and it is hoped that a park master plan for the site will be advanced. Since 2010, the site is been used as a major Civic Recycling Facility for the County[17].

4.8.3 Fishing and Marine Resources

The fishing industry in Dún Laoghaire-Rathdown relates not only to commercial fishing (at sea and inland) but also to tourism and recreational activities. The harbours of Dún Laoghaire and Bullock provides fishing year round and are used as recreational and amenity harbours.

The marine resource is very important to Dún Laoghaire-Rathdown as it supports a significant number of water based activities, both work and pleasure related. These include boat hire, yachting, adventure sports, pier/shore angling, sea angling, dolphin and bird watching, hiking, visiting heritage sites and festivals. Dublin Bay Cruises also sail from Dún Laoghaire-Rathdown to Howth daily during the summer months.

4.8.4 Transport

The Vision Statement of the Plan's Sustainable Communities Strategy is "to create sustainable and successful communities through the consolidation of development into appropriate areas, where residents will be within walking distance of public transport networks and supporting community infrastructure including shops, services, employment, education and leisure facilities".

In terms of trips to work, school and college, walking travel mode share in Dún Laoghaire-

[16] EPA (2014) National Waste Report 2012

[17] Source: Dún Laoghaire-Rathdown County Council

Rathdown is below the Greater Dublin Area (GDA) average, cycling is higher than the GDA average, while overall public transport usage is also above the GDA average. The car, however, remains the dominant mode of transport with 54% of trips being undertaken by this mode (including car passengers).

There is a relatively high quality pedestrian network throughout the County. In recent years, there has been significant investment in pedestrian infrastructure with a particular focus on the larger urban areas such as Dún Laoghaire, Blackrock, Dundrum and Stillorgan. The key issue is to confer a high quality offer, if not a competitive advantage, on pedestrian movements for short trips related to the main towns, key local destinations and transport hubs/ interchanges.

In 2012, a County Cycle Network was developed following a comprehensive evidence-based review that assessed all cycling routes in the County in terms of Quality of Service. Currently over 250km of cycle routes exist in the County with many off-road routes through the major parks. The Cycle Network aims to connect the main attractors (e.g. town centres, colleges etc) within the County and to provide effective through-movement for cyclists. It also provides a priority list for the development of a network of Primary Routes (between locations of highest cycling demand) and Secondary Routes (routes through residential estates and parks) to give cyclists route options alternative to cycling along main road traffic corridors.

There is a well-established network of bus routes in the County including a number of significant radial bus corridors. The busiest of these is the N11, where there is a high frequency and high capacity services operating along most of the corridor. There are also frequent services operating on the Rock Road radial corridor. There are, however, a more limited number of east-west orbital services in the County and those that do originate-terminate at Blackrock and Dún Laoghaire Dart Stations. The continued expansion of the Bus Network is of the upmost importance. In addition, the continuation and improvement of existing bus services along radial and orbital routes, subject to sufficient demand and availability of finance, is also considered a priority.

There are two rail corridors in Dún Laoghaire-Rathdown, the Luas Green Line and the South East rail line (DART). Frequent, high capacity services operate along both these routes. A continuing commitment to the maintenance of frequent, high capacity services operating on both lines is essential.

There are three significant National Road corridors that operate through the County – M50, N11/M11 and N32. The safety, capacity and efficiency of these important corridors will be maintained and protected through development management measures in line with Transport Infrastructure Ireland policy and other ongoing improvements to improve the effectiveness of these routes.

4.8.5 Existing Problems

There are a number of challenges with respect to water services which are outlined under Section 4.8.1.2.

The Dublin City Council operated waste water treatment plant in Ringsend failed to meet mandatory Waste Water Treatment Directive related quality standards for phosphorus and nitrogen set in the Directive during 2014[18].

The most recent EPA Remedial Action List (Q4 of 2015) identified one water supply within the County (Roundwood) in need of improvement with respect to treatment and management issues. The Remedial Action List identifies "Replacement of Callow Hill Tunnel, use of covered storage reservoir and upgrade of disinfection system" for solving these issues.

The provisions of the new Plan 2016-2022 will contribute towards protection of the environment with regard to impacts arising from material assets.

4.9 Cultural Heritage

4.9.1 Introduction

Heritage, by definition, means inherited properties, inherited characteristics and anything transmitted by past ages and ancestors. It covers everything, from objects and buildings to the environment. Cultural heritage includes physical buildings, structures and objects, complete or in part, which have

[18] EPA (2015) *Focus on Urban Waste Water Treatment in 2014*

been left on the landscape by previous and indeed current generations.

The 'Dún Laoghaire-Rathdown Heritage Plan' 2013- 2018 was adopted by the Council. It contains a number of actions to include communicating the story of the County's heritage, caring for and managing that heritage, and increasing the level of community involvement in heritage.

4.9.2 Archaeological Heritage

4.9.2.1 Introduction

Archaeology is the study of past societies through the material remains left by those societies and the evidence of their environment. Archaeological heritage consists of such material remains (whether in the form of sites and monuments or artefacts in the sense of moveable objects) and environmental evidence. As archaeological heritage can be used to gain knowledge and understanding of the past it is of great cultural and scientific importance.

Archaeological sites and monuments vary greatly in form and date; examples include earthworks of different types and periods, (e.g. early historic ringforts and prehistoric burial mounds), megalithic tombs from the Prehistoric period, medieval buildings, urban archaeological deposits and underwater features.

Archaeological sites may have no visible surface features; the surface features of an archaeological site may have decayed completely or been deliberately removed but archaeological deposits and features may survive beneath the surface.

Dún Laoghaire-Rathdown contains various types of archaeological heritage which are protected as monuments.

4.9.2.2 Record of Monuments and Places

Dún Laoghaire-Rathdown's archaeological heritage is protected under the National Monuments Acts (1930-2004), Natural Cultural Institutions Act 1997 and the Planning Acts.

The Record of Monuments and Places (RMP) is an inventory, put on a statutory basis by amendment to the National Monuments Act 1994, of sites and areas of archaeological significance, numbered and mapped.

The term 'monument' includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes. All monuments in existence before 1700 A.D. are automatically considered to be historic monuments within the meaning of the Acts. Monuments of architectural and historical interest also come within the scope of the Acts. Monuments include: any artificial or partly artificial building, structure or erection or group of such buildings, structures or erections; any cave, stone or other natural product, whether or not forming part of the ground, that has been artificially carved, sculptured or worked upon or which (where it does not form part of the place where it is) appears to have been purposely put or arranged in position; any, or any part of any, prehistoric or ancient tomb, grave or burial deposit, or, ritual, industrial or habitation site; and any place comprising the remains or traces of any such building, structure or erection, any such cave, stone or natural product or any such tomb, grave, burial deposit or ritual, industrial or habitation site, situated on land or in the territorial waters of the State', but excludes 'any building or part of any building, that is habitually used for ecclesiastical purposes' (National Monuments Acts 1930-2004).

A recorded monument is a monument included in the list and marked on the map which comprises the RMP set out county by county under Section 12 of the National Monuments (Amendment) Act, 1994 by the Archaeological Survey of Ireland. The definition includes Zones of Archaeological Potential in towns and all other monuments of archaeological interest which have so far been identified.

In Dún Laoghaire-Rathdown, there are approximately 400 items on the RMP, with a Zone of Archaeological Potential identified around each monument. There are more entries to the RMP in the rural, south eastern parts of the Plan area though clusters exist at Dalkey Island and at Dalkey. Clusters also exist west of Loughlinstown and at Glencullen and also at Kilmashogue Mountain in the west of the Plan area.

Figure 4.21 shows the spatial distribution of entries to the RMP in Dún Laoghaire-Rathdown.

Enclosures, Fulacht Fias, Castles, Churches and Grave Yards are amongst the most popular recorded monuments in the Plan area.

Enclosures include areas defined by an enclosing element and occurring in a variety of shapes and sizes, possessing no diagnostic features which would allow classification within another monument category. These may date to any period from prehistory onwards.

A Fulacht Fia is a horseshoe-shaped or kidney-shaped mound consisting of fire-cracked stone and charcoal-enriched soil built up around a sunken trough located near or adjacent to a water supply, such as a stream or spring, or in wet marshy areas. The first recorded use of the Irish term 'fulacht fiadh/fia' (cooking pit of the deer or of the wild) as relating to ancient cooking sites was in the 17th century. These are generally interpreted to have been associated with cooking and date primarily to the Bronze Age (c. 2400-500 BC).

Castles can date from the late 12th to the 16th century AD. Castles in the Plan area include Anglo-Norman masonry castles, hall-houses and tower houses.

Churches are used for public Christian worship. These can be of any date from c. 500 AD onwards.

Grave yards include the burial area around a church. These date from the medieval period (5th-16th centuries) onwards.

4.9.3 Architectural Heritage

4.9.3.1 Introduction

The term architectural heritage is defined in the Architectural Heritage (National Inventory) and Historic Monuments Act 1999 as meaning all: structures and buildings together with their settings and attendant grounds, fixtures and fittings; groups of structures and buildings; and, sites which are of technical, historical, archaeological, artistic, cultural, scientific, social, or technical interest.

4.9.3.2 Record of Protected Structures

The Record of Protected Structures (RPS) included in the Development Plan is legislated for under Section 12 and Section 51 of the Planning and Development Act 2000 as amended.

Protected Structures are defined in the Planning and Development Act 2000 as amended as structures, or parts of structures that are of special interest from an architectural, historical, archaeological, artistic, cultural, scientific, social or technical point of view.

In relation to a protected structure or proposed protected structure, the following are encompassed:

(i) the interior of the structure;
(ii) the land lying within the curtilage[19] of the structure;
(iii) any other structures lying within that curtilage and their interiors; and,
(iv) all fixtures and features which form part of the interior or exterior of any structure or structures referred to in subparagraph (i) or (iii).

There are currently in excess of 2,000 Protected Structures within the County.

These structures include harbours, piers, boat slips, bridges, quarries, Martello Towers, Victorian terraces, Georgian houses, public buildings, street furniture, churches, castles, schools, yacht clubs and a range of domestic architecture.

Figure 4.22 maps the location of entries to the Record of Protected Structures within the Plan area. These are mainly located along the coastline from Blackrock to Dalkey.

A National Inventory of Architectural Heritage (NIAH) Survey for the Dún Laoghaire-Rathdown area has yet to be published.

[19] Curtilage is normally taken to be the parcel of ground immediately associated with the Protected Structure, or in use for the purposes of the structure. Protection extends to the buildings and land lying within the curtilage. While the curtilage sometimes coincides with the present property boundary, it can originally have included lands, features or even buildings now in separate ownership, e.g. the lodge of a former country house, or the garden features located in land subsequently sold off. Such lands are described as being attendant grounds, and the protection extends to them just as if they were still within the curtilage of the Protected Structure.

4.9.3.3 Architectural Conservation Areas

An Architectural Conservation Area (ACA) is a place, area, group of structures or townscape, which is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or contributes to the appreciation of a Protected Structure. An ACA may or may not include Protected Structures. In an ACA, protection is placed on the external appearance of such areas or structures. Planning permission must be obtained before significant works can be carried out to the exterior of a structure in an ACA, which might alter the character of the structure, or of the ACA.

Dún Laoghaire-Rathdown has 26 designated ACAs which range from groups of artisan and estate workers cottages, planned residential Victorian squares to large areas of residential suburbs and villages. The ACAs include:

- Ballally Cottages
- Castle Cottages
- Dalkey
- Dún Laoghaire Central
- Foxrock
- Haigh Terrace to Park Road
- Killiney
- Monkstown
- Montpelier Place, Temple Hill
- Moss Cottages
- Newtown Villas
- Pembroke Estate Cottages
- Sandycove
- Silchester Road
- Vico Road

The Planning and Development Act, 2000 provides the legislative basis for the protection of such areas, known as Architectural Conservation Areas (ACAs). An ACA is a place, area or group of structures or townscape which is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or value, or contributes to the appreciation of protected structures, whose character it is an objective to preserve in a development plan. The ACA designation requires that planning permission must be obtained before significant works can be carried out to the exterior of a structure in the ACA which might alter the character of the structure or the ACA.

ACAs enable the protection of the existing character of areas within the settlements listed above throughout the County. This character is a combination of the various layers of development from earliest times to the present. Though often not individually very important, vernacular buildings contribute to the acknowledged distinctive character of many of the County's built up areas. Collectively, if properly used and maintained, they can make a significant impact on the retention and enhancement of that character which is important in maintaining local distinctiveness for both inhabitants and visitors.

Ongoing works have taken place to protect and enhance buildings and assets in Council ownership. These include Seapoint Martello Tower, the Killiney Tea Rooms, Stillorgan Obelisk, the wall of the Carrickbrennan Graveyard and Deansgrange Cemetery.

The *Dún Laoghaire-Rathdown Heritage Plan 2013-2019* aims to continue the progress on the programme of Architectural Conservation Areas (ACAs) and also aims to complete the main restoration activity at Marlay and Cabinteely Houses.

Architectural Conservation Areas and Conservation Areas are mapped on Figure 4.23.

4.9.4 Existing Problems

The context of archaeological and architectural heritage has changed over time within Dún Laoghaire-Rathdown however no existing conflicts with legislative objectives governing archaeological and architectural heritage have been identified.

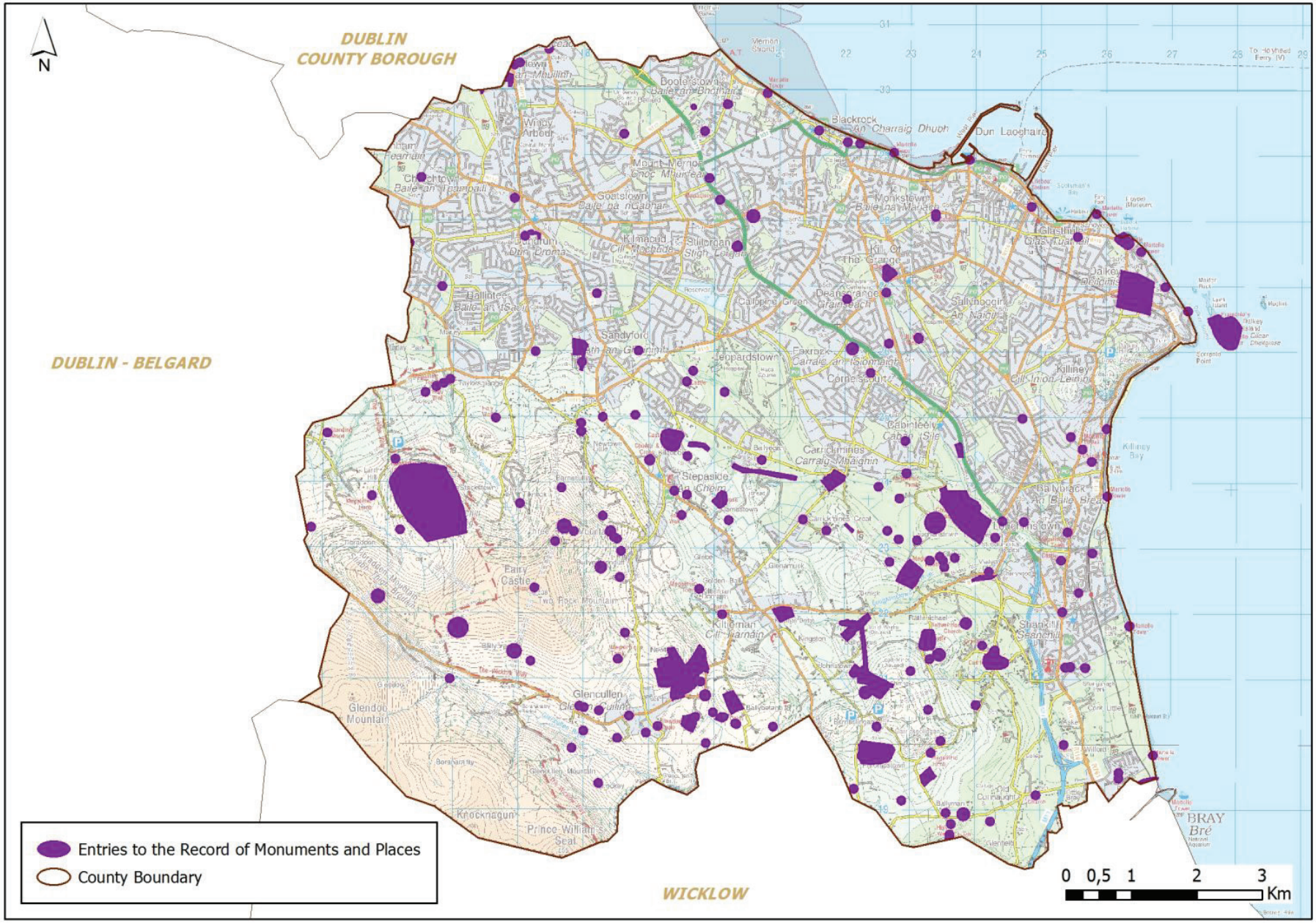

Figure 4.21 Entries to the Record of Monuments and Places
Source: Dún Laoghaire-Rathdown County Council (Unknown)

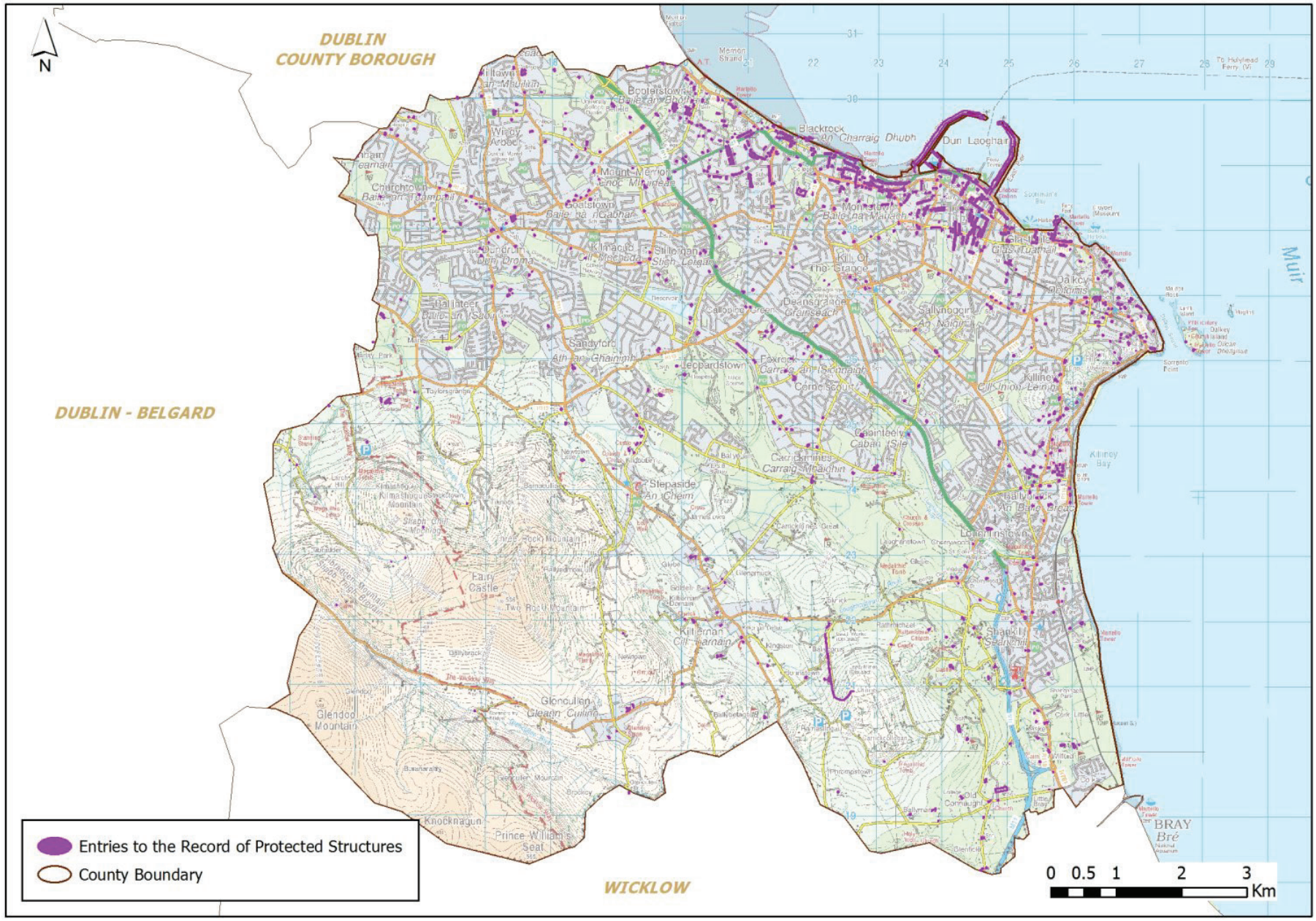

Figure 4.22 Entries to the Record of Protected Structures
Source: Dún Laoghaire-Rathdown County Council (2010)

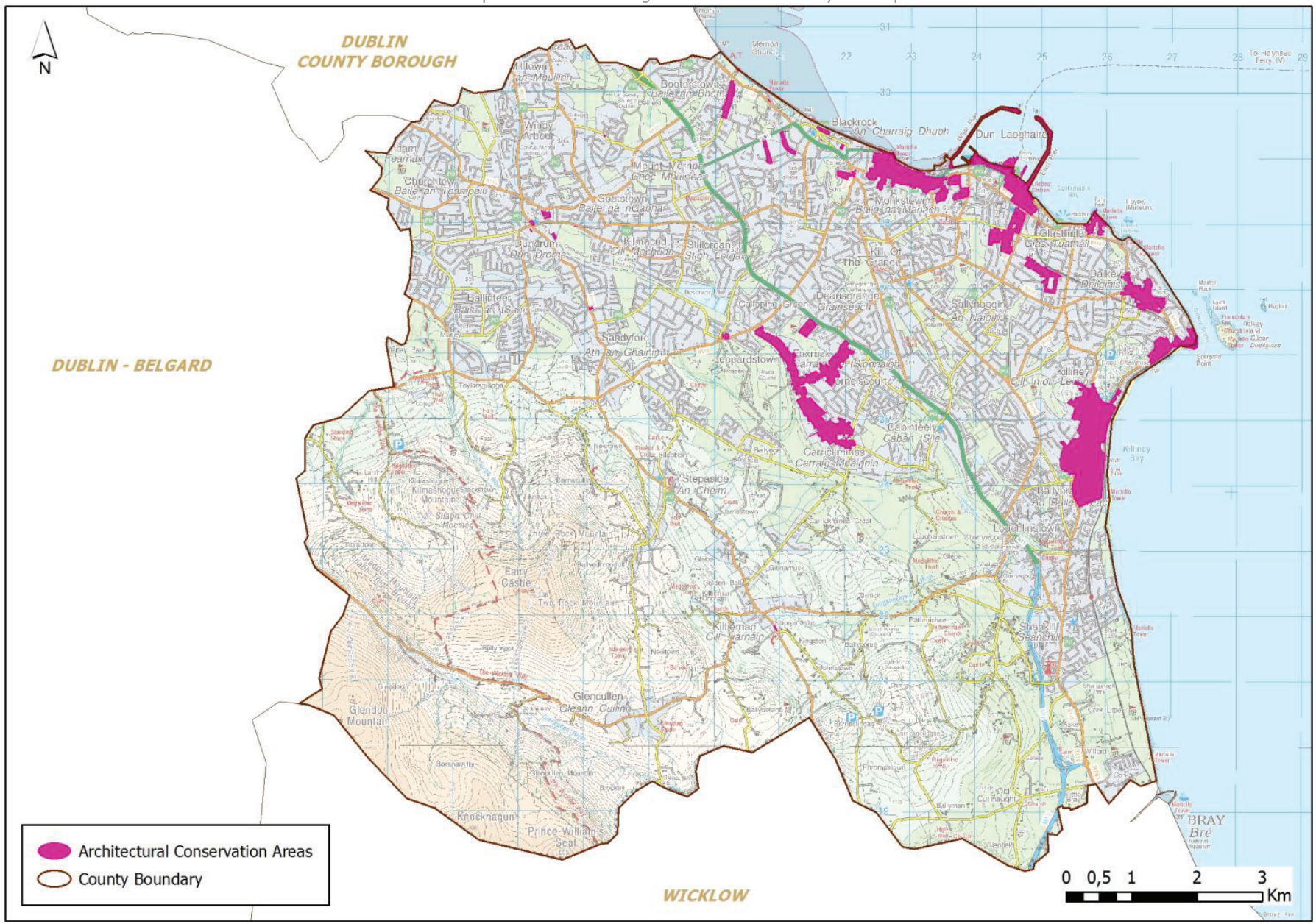

Figure 4.23 Architectural Conservation Areas (ACAs)
Source: Dún Laoghaire-Rathdown County Council (2014)

4.10 Landscape

4.10.1 Introduction

Landscapes are areas which are perceived by people and are made up of a number of layers: landform, which results from geological and geomorphological history; landcover, which includes vegetation, water, human settlements, and; human values which are a result of historical, cultural, religious and other understandings and interactions with landform and landcover.

4.10.2 Legislation

The importance of landscape and visual amenity and the role of its protection are recognised in the Planning and Development Act 2000 as amended, which requires that Development Plans include objectives for the preservation of the landscape, views and the amenities of places and features of natural beauty.

4.10.3 Landscape Character Assessment and Areas

Landscape Character Assessment attempts to describe landscapes in terms of their character in an objective way. This can be used to inform decision making in relation to the protection of the environment, natural resources and heritage; it can be used to monitor change and can be used to guide development.

In accordance with the DEHLG's Landscape and Landscape Assessment Guidelines (2000), Dún Laoghaire-Rathdown County Council have identified 14 Landscape Character Areas which are listed below and mapped on Figure 4.24:

1. Kilmashogue Valley
2. Western Half of Kellystown Road
3. Ticknock Road
4. Marlay Park
5. Kilternan Plain
6. Ballycorus
7. Glencullen Valley
8. Glendoo Valley
9. Barnacullia
10. Rathmichael
11. Ballyman
12. Shanganagh
13. Carrickmines
14. Cherrywood Rathmichael

There is a commitment given in the Plan 2016-2022 to review the Landscape Character Areas when new National guidance is issued.

4.10.4 High Amenity Zones

The County Development Plan designates High Amenity Zones in the southern portion of the County. These areas consist of landscapes of special value where inappropriate development would contribute to a significant diminution of the landscape setting of the County.

It is the policy of the Council to conserve and enhance existing High Amenity Zones and to seek to manage these and other areas to absorb further recreational uses and activity without damaging the amenities that affords them their special character.

Areas covered by the High Amenity Zoning include the Glencullen Valley, Glendoo Valley and Kilmashogue Valley.

The areas adjacent to the High Amenity areas are also sensitive landscapes as development in these areas may affect directly or indirectly the quality of the High Amenity areas.

High Amenity Zones are mapped on Figure 4.25.

4.10.5 Historic Landscape Character Areas

An Historic Landscape Character Assessment (HLCA) is a detailed holistic study of the historical development and environmental significance of an area. Such assessments present an overview of the physical, natural, human, and cultural heritage of an area with specific reference to the interaction between the various elements.

Five HLCAs have been carried out in the County to date – Barnacullia, Kiltiernan, Glencullen, Ballycorus - Rathmichael and Old Conna. The assessments cover areas generally on the urban-rural fringe and are thus most likely to come under development pressure during the course of the Plan.

4.10.6 Views and Prospects

The County contains many sites, areas and vantage points from which views over areas of great natural beauty, local landmarks, historic landscapes, adjoining Counties and the City of Dublin may be obtained. In addition to scenic views, the County also contains important prospects i.e. prominent landscapes or areas of special amenity value or special interest which are visible from the surrounding area.

Specific Views and Prospects for protection have been identified in the Plan and are considered when assessing planning applications. These Views and Prospects are mapped on Figure 4.26.

A list of Prospects which are included in the Plan are listed below.

1. Dublin City and Bay from Deerpark, Mount Merrion
2. Carrickgollogan from Ballybrack (e.g. Church Road and Churchview Road)
3. Carrickgollogan from Bray Road (Shankill to Bray area)
4. Carrickgollogan from Ballyman Road
5. Carrickgollogan from the Enniskerry Road (south of Kiltiernan Village)
6. The Scalp from Ballyman Road and part of the Enniskerry Road
7. Three Rock Mountain and Two Rock Mountain from the Enniskerry Road (Sandyford -Kilternan area) and Sandyford Village
8. Three Rock Mountain and Two Rock Mountain from the Ballybrack Road
9. Three Rock Mountain and Kilmashogue Mountain from Marlay Park
10. Tibradden Mountain and Kilmashogue Mountain from Kilmashogue Lane
11. Glencullen Mountain and Valley from the Ballybrack Road
12. Glendoo Mountain from the Ballybrack Road
13. Dalkey Hill from Ulverton Road, Station Road and the East Pier
14. Killiney Hill from Vico Road, Station Road and the East Pier

4.10.7 The Coast and the Mountains

The Coast and the Dublin Mountains of Dún Laoghaire-Rathdown are significant features iconic of the County. They are also both used for a wide variety of purposes - amenity, recreation, commercial, industrial, sporting and military. They represent areas of high landscape quality, natural heritage and amenity value.

It is Council policy to, inter alia: co-operate with the Coastal Zone Management Division of the Department of Agriculture, Food and the Marine in the preparation and implementation of a National Coastal Zone Management Strategy to ensure the conservation, management and protection of man-made and natural resources of the Coastal Zone; and to support the vision and objectives of the Dublin Mountains Strategic Plan for Development of Outdoor Recreation (2007-2017) including the continued development and enhancement of the Dublin Mountains Way.

4.10.8 Landscape Designations in adjacent counties

4.10.8.1 Introduction

Planning applications within the Council's administrative area have the potential to affect landscape designations in the administrative areas of Wicklow, Dublin City and South Dublin.

4.10.8.2 Dublin City

As identified by the Dublin City Development Plan 2011-2017 SEA Environmental Report, Development Plan land-use zonings that primarily relate to landscape protection are Z8 Conservation Areas, Z9 Amenity/Open Space (is a component of other zonings' permissible uses) and Z11 waterways (see Figure 4.27). The Little Dargle and Slang Rivers which flow through Dún Laoghaire-Rathdown's area into Dublin City's area are shown on this map.

The Dublin City Development Plan 2011-2017 identifies key views and prospects (Figure 4 of the Dublin City Development Plan 2011-2017) but none of these cover areas adjacent to Dún Laoghaire-Rathdown.

4.10.8.3 Wicklow

Wicklow County Council's Landscape Characterisation contained in their 2010-2016 County Plan classifies landscapes in Wicklow according to their sensitivity – their ability to accommodate change or intervention without suffering unacceptable effects to character and values. The most sensitive landscapes are Areas of Outstanding Natural Beauty - which

are of a very high sensitivity - and Areas of Special Amenity - which are of a high sensitivity. Landscapes of lesser sensitivity are Rural and Corridor Areas which are both of medium sensitivity. Urban Areas are considered low sensitivity areas. To immediate the south of Dún Laoghaire-Rathdown the landscape is designated as an Area of Outstanding Natural Beauty, except where it is designated Urban Area at Bray (see Figure 4.29).

The Wicklow County Development Plan also provides for protected views and prospects some of which occur to the immediate south of Dún Laoghaire-Rathdown (see Figure 4.30).

4.10.8.4 South Dublin

The land use zoning contained in the South Dublin County Development Plan 2010-2016 for areas adjacent to Dún Laoghaire-Rathdown (not mapped in this report) comprises two zonings that relate to landscape protection as follow:

- Zoning Objective G *To protect and enhance the outstanding natural character of the Dublin Mountain area* covers areas adjacent to western boundary of Dún Laoghaire-Rathdown around Cruagh and Glendoo Mountains.

- Zoning Objective GB *To provide a green best between development areas* covers areas adjacent to western boundary of Dún Laoghaire-Rathdown to the south of Edmonstown around Rockbrook.

Other zonings to the north of the M50 do generally not primarily provide for the landscape protection.

4.10.9 Existing Environmental Problems

New developments have resulted in changes to the visual appearance of lands within the County however legislative objectives governing landscape and visual appearance were not identified as being conflicted with.

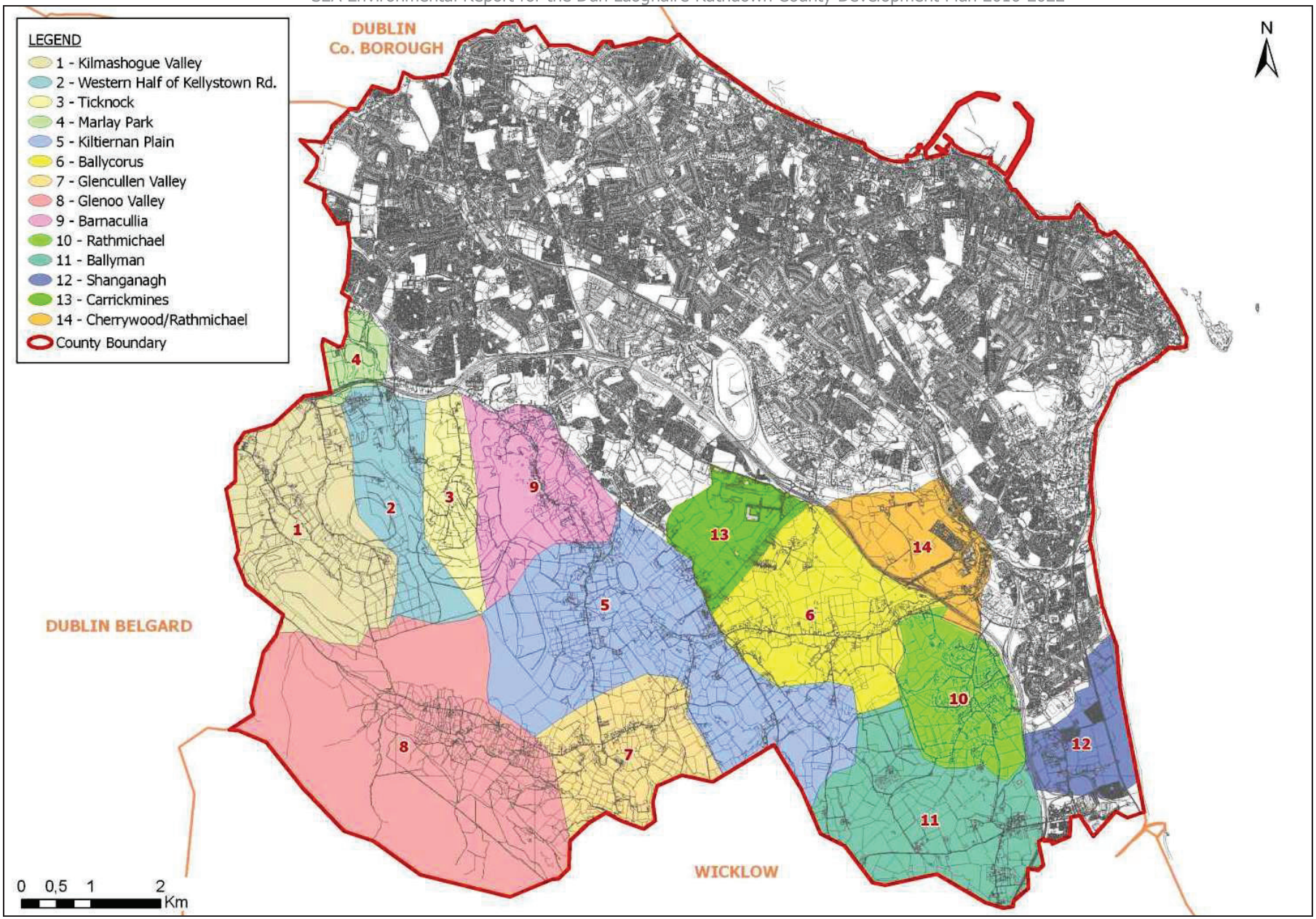

Figure 4.24 Landscape Character Areas
Source: Dún Laoghaire-Rathdown County Council (2010)

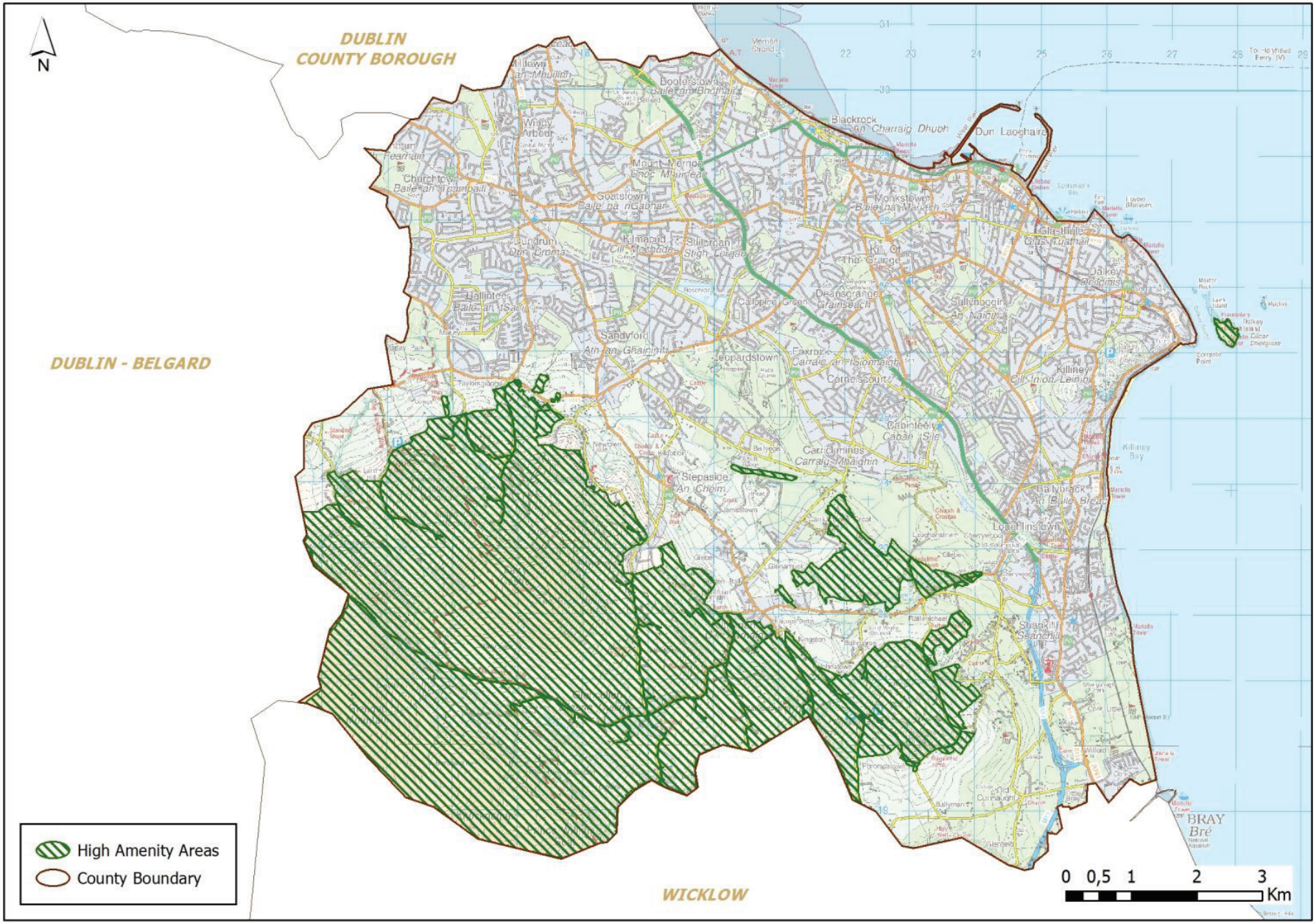

Figure 4.25 High Amenity Area Zoning
Source: Dún Laoghaire-Rathdown County Council (2014)

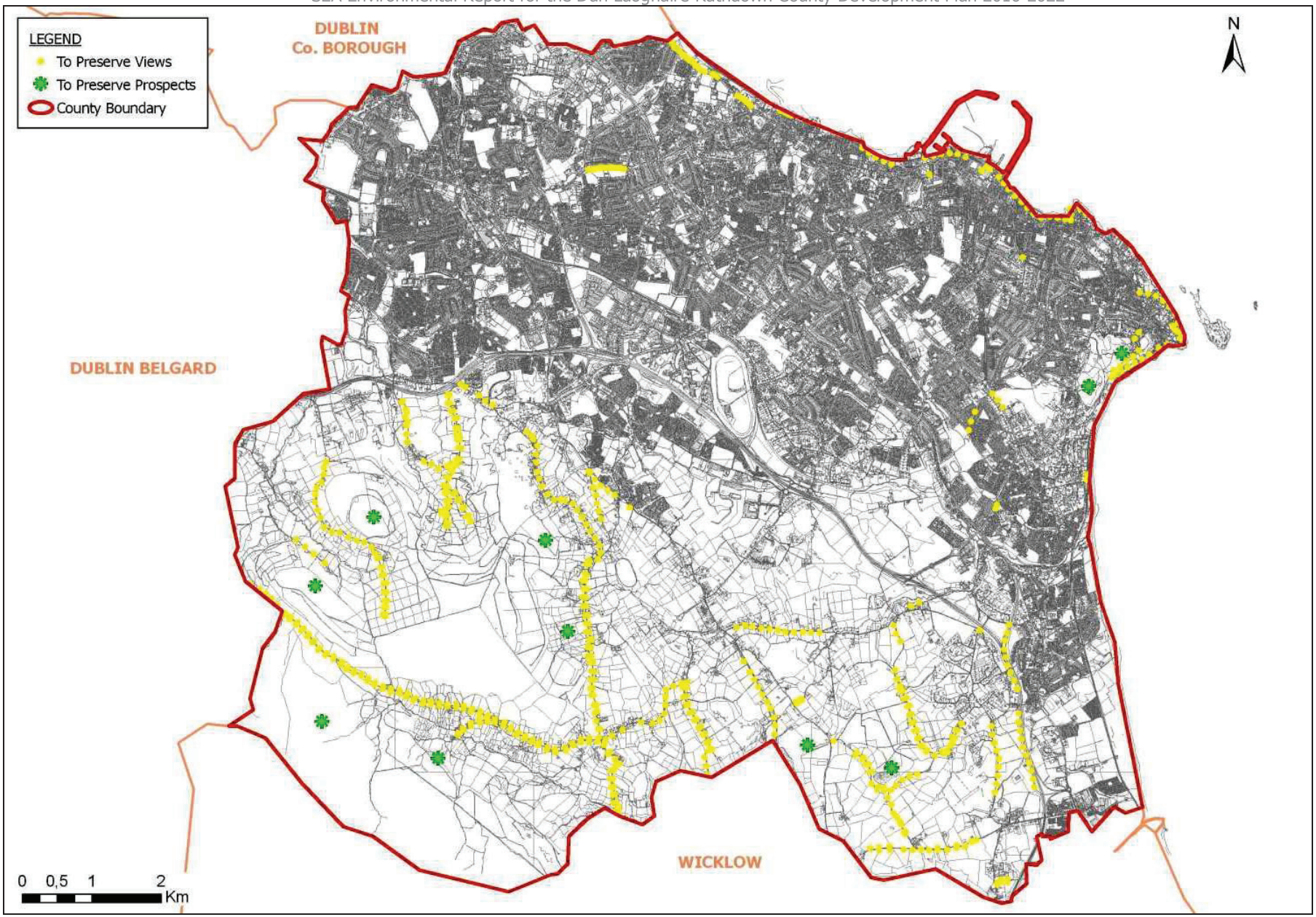

Figure 4.26 Protected Views and Prospects
Source: Dún Laoghaire-Rathdown County Council (2010)

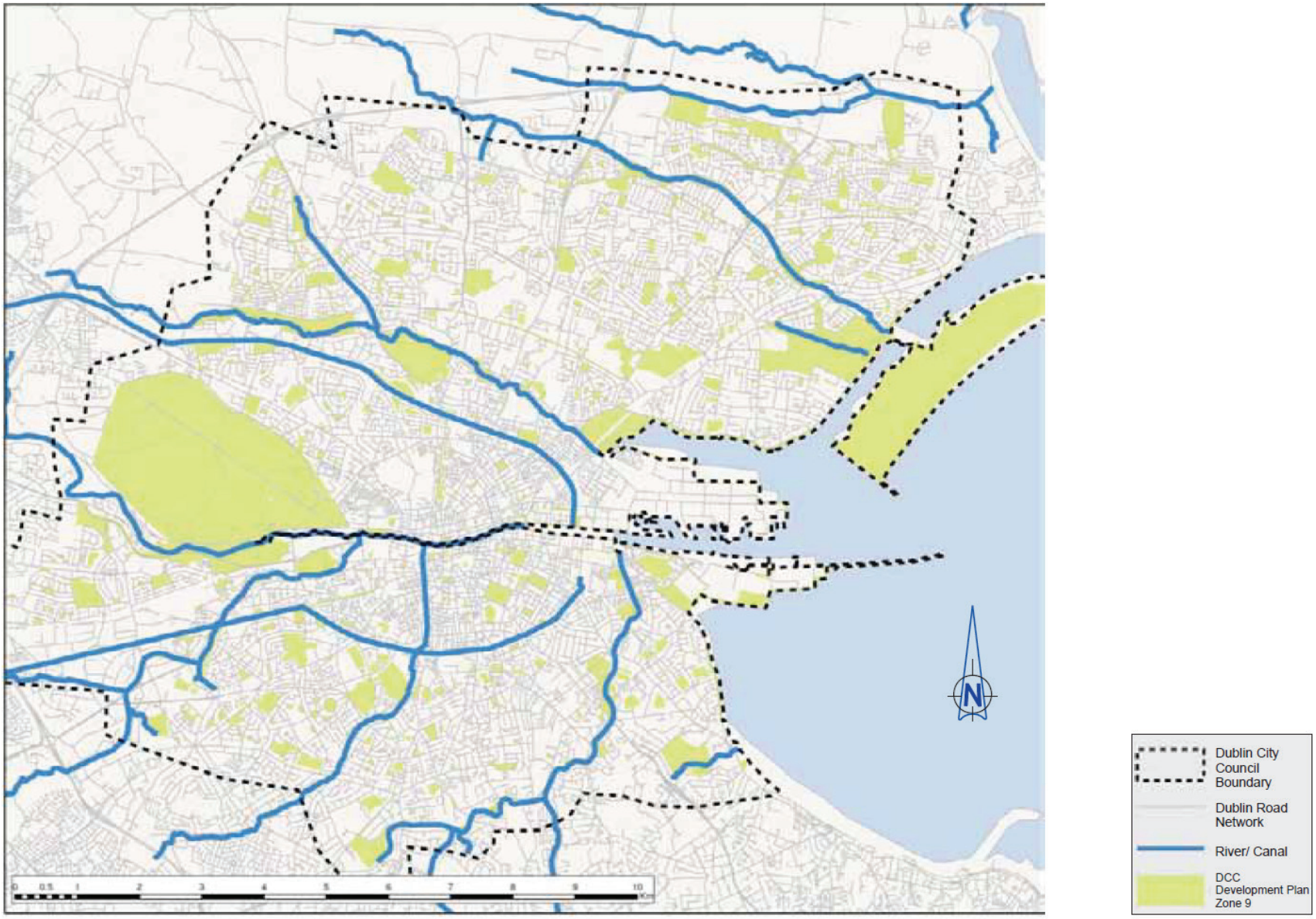

Figure 4.27 Dublin City Council land-use zonings that primarily relate to landscape protection
Source: Dublin City Council (2011)

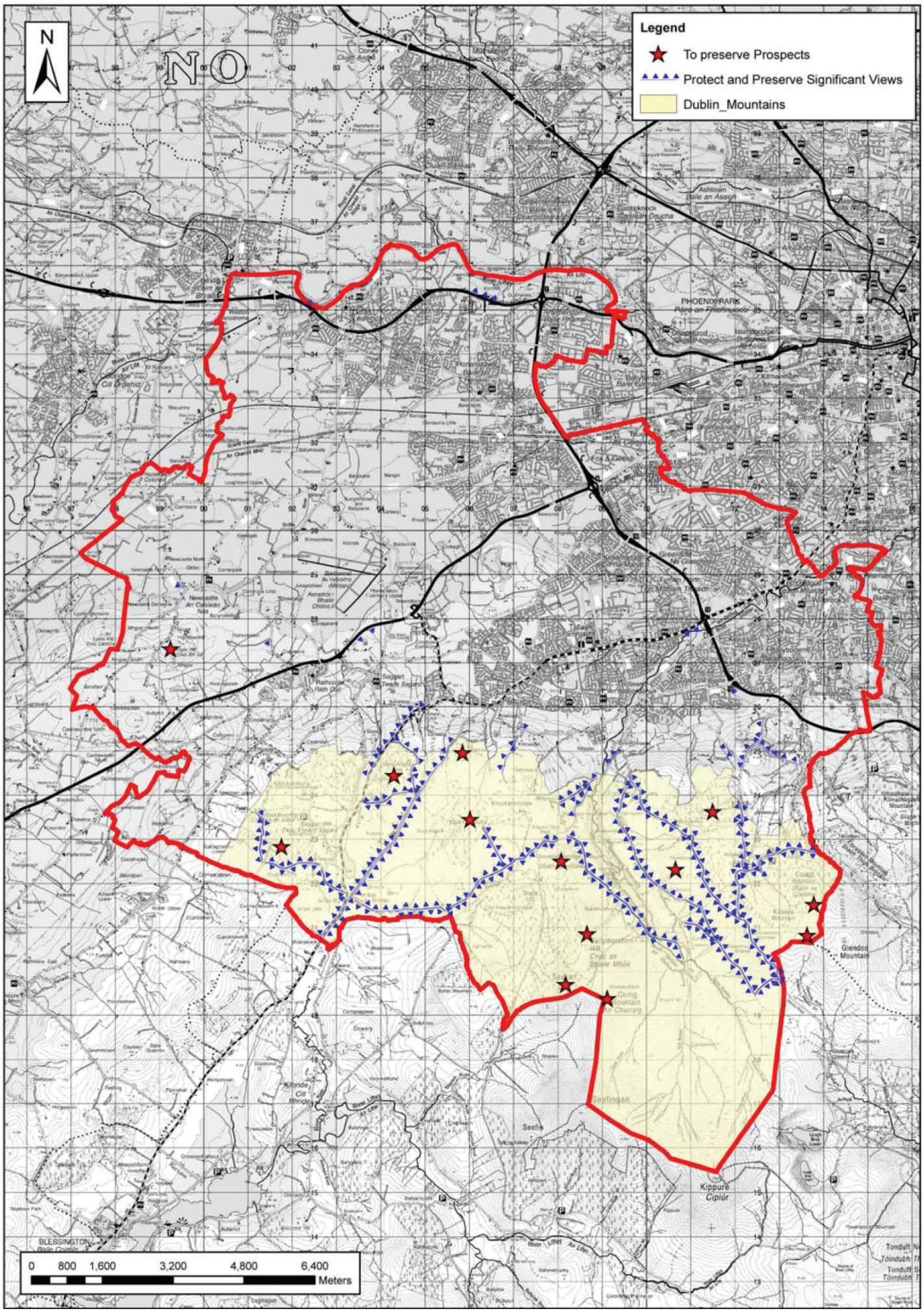

Figure 4.28 South Dublin County Council Protected Views and Prospects
Source: South Dublin County Council (2010)

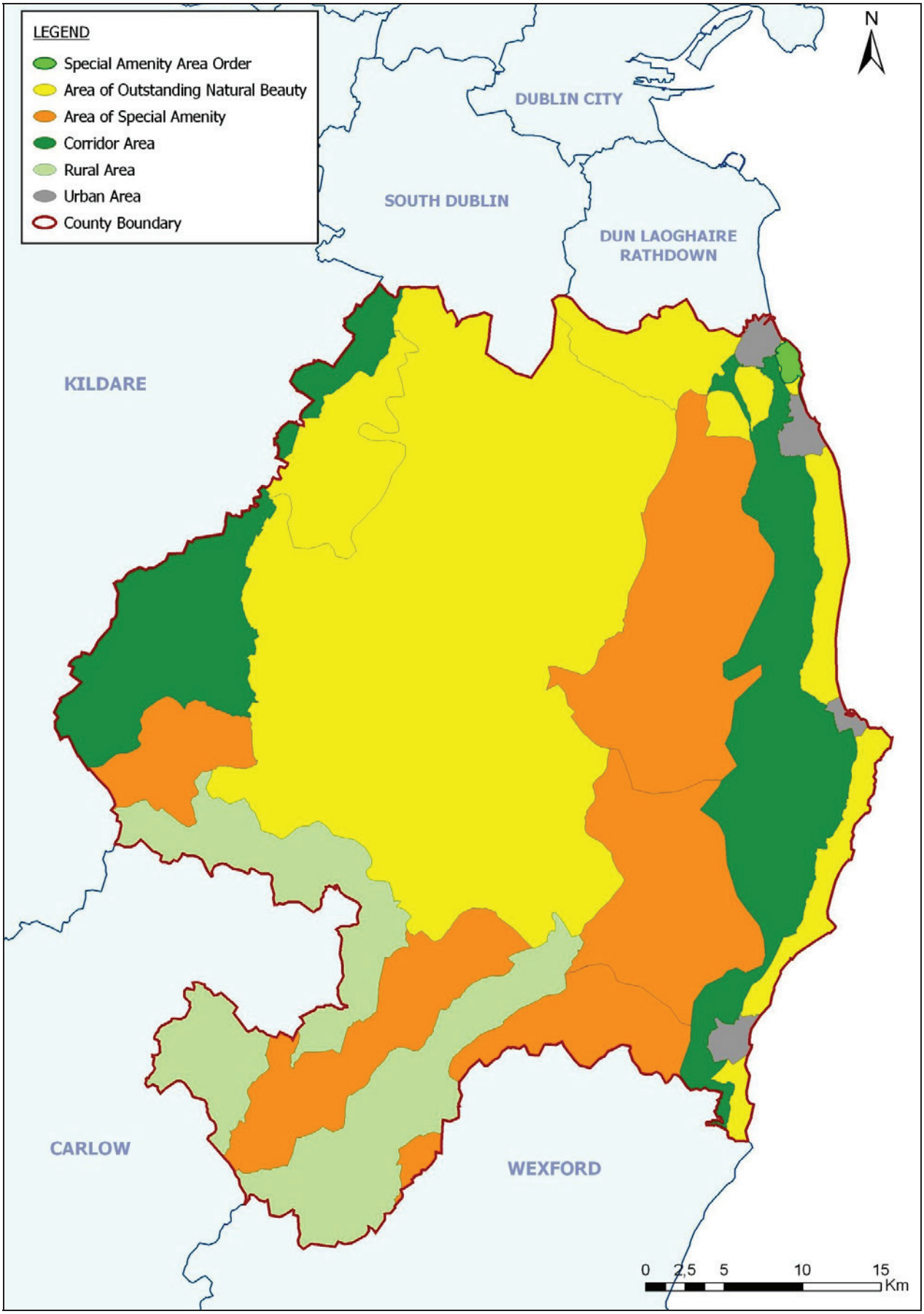

Figure 4.29 Wicklow County Council Landscape Character Areas
Source: Wicklow County Council (2010)

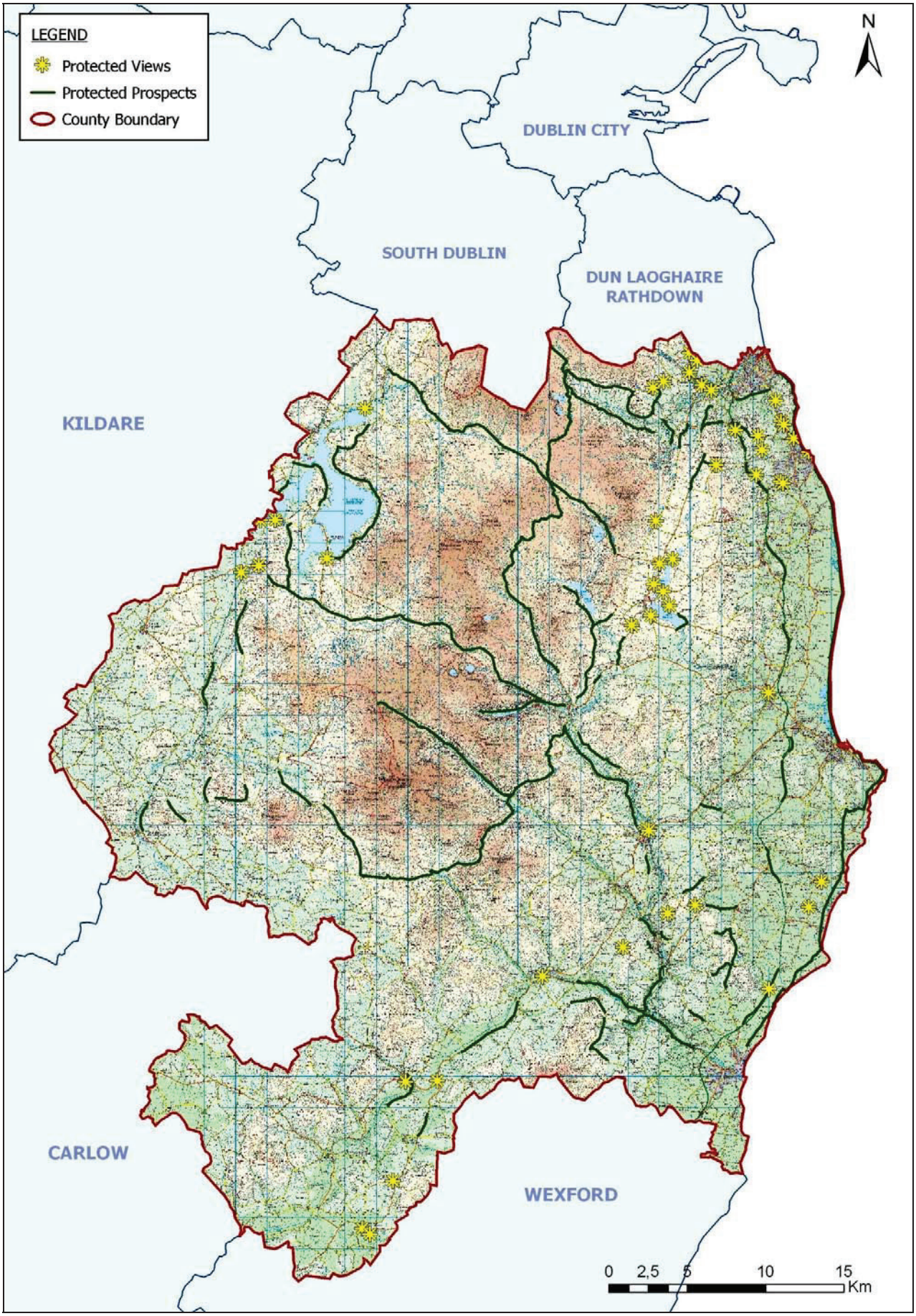

Figure 4.30 Wicklow County Council Protected Views and Prospects
Source: Wicklow County Council (2010)

4.11 Overlay Mapping

4.11.1 Introduction and Methodology

In order to identify where most sensitivities within the County occur, a number of the environmental sensitivities described above were weighted and mapped overlapping each other. Figure 4.31 provides an overlay of environmental sensitivities for the County.

It is emphasised that the occurrence of environmental sensitivities does not preclude development; rather it flags at a strategic level that the mitigation measures - which have been integrated into the Plan - will need to be complied with in order to ensure that the implementation of the Plan contributes towards environmental protection.

Environmental sensitivities are indicated by colours which range from acute vulnerability (brown) extreme vulnerability (red) to high vulnerability (dark orange) to elevated vulnerability (light orange) to moderate vulnerability (yellow) to low vulnerability (green). Where the mapping shows a concentration of environmental sensitivities there is an increased likelihood that development will conflict with these sensitivities and cause environmental deterioration.

A weighting system applied through Geographical Information System (GIS) software was used in order to calculate the vulnerability of all areas in the County. A slight differentiation is made in certain layers as follows:

- Ecological designations (Special Areas of Conservation, Margaritifera catchments and Salmonid rivers 10 points; proposed Natural Heritage areas 5 points);
- cSAC and SPA waterbodies (10 points);
- Cultural Heritage (entries to the Entries to the Record of Monuments and Places, Architectural Conservation Areas, entries to Records of Protected Structures and entries to the National Inventory of Architectural Heritage 10 points);
- Scenic Routes and View Points 10 points;
- Geological Sites of Importance 10 points;
- Sensitive Landcover categories (broad-leaved forests, peat bogs, natural grassland and water bodies 10 points);
- Entries to the Register of Protected Areas for drinking water (both surface and ground water bodies) 10 points;
- Flood extents 10 points; and
- Aquifers which are highly (5 points) or extremely (10 points) vulnerable to pollution;
- Surface with poor (10 points) ecological status.

The scale of sensitivity for each area of the County corresponds to the sensitivity factors: 5 points corresponds to one sensitivity factor; 10 points corresponds to two sensitivity factors; 20 points corresponds to four sensitivity factors and so on. The scores for each area are added together in order to determine overall vulnerability as is shown on Table 4.4.

Score	Vulnerability Class
5-15	**Low**
20-25	**Moderate**
30-35	**Elevated**
40-45	**High**
50-60	**Extreme**
>60	**Acute**

Table 4.4 Overall Vulnerability Classes

4.11.2 Conclusions

As previously referenced, the occurrence of multiple sensitivities in any location does not preclude development; rather it flags at a strategic level that the mitigation measures - which have already been integrated into the Plan as policies and objectives - will need to be complied with in order to ensure that the implementation of the Plan contributes towards environmental protection.

The overlay mapping shows that most of the County is of a low to moderate sensitivity. The level of environmental sensitivity increases towards the south west of the County due to ecological designations (including cSAC and pNHA designations), water sensitivities (extremely and highly vulnerable aquifers), sensitive landcover (peat bogs) and landscape designations (scenic routes and viewpoints). A small number of areas were classified as being of Extreme to Acute Vulnerability (sensitivities include hydrological, ecological, landscape and flood risk).

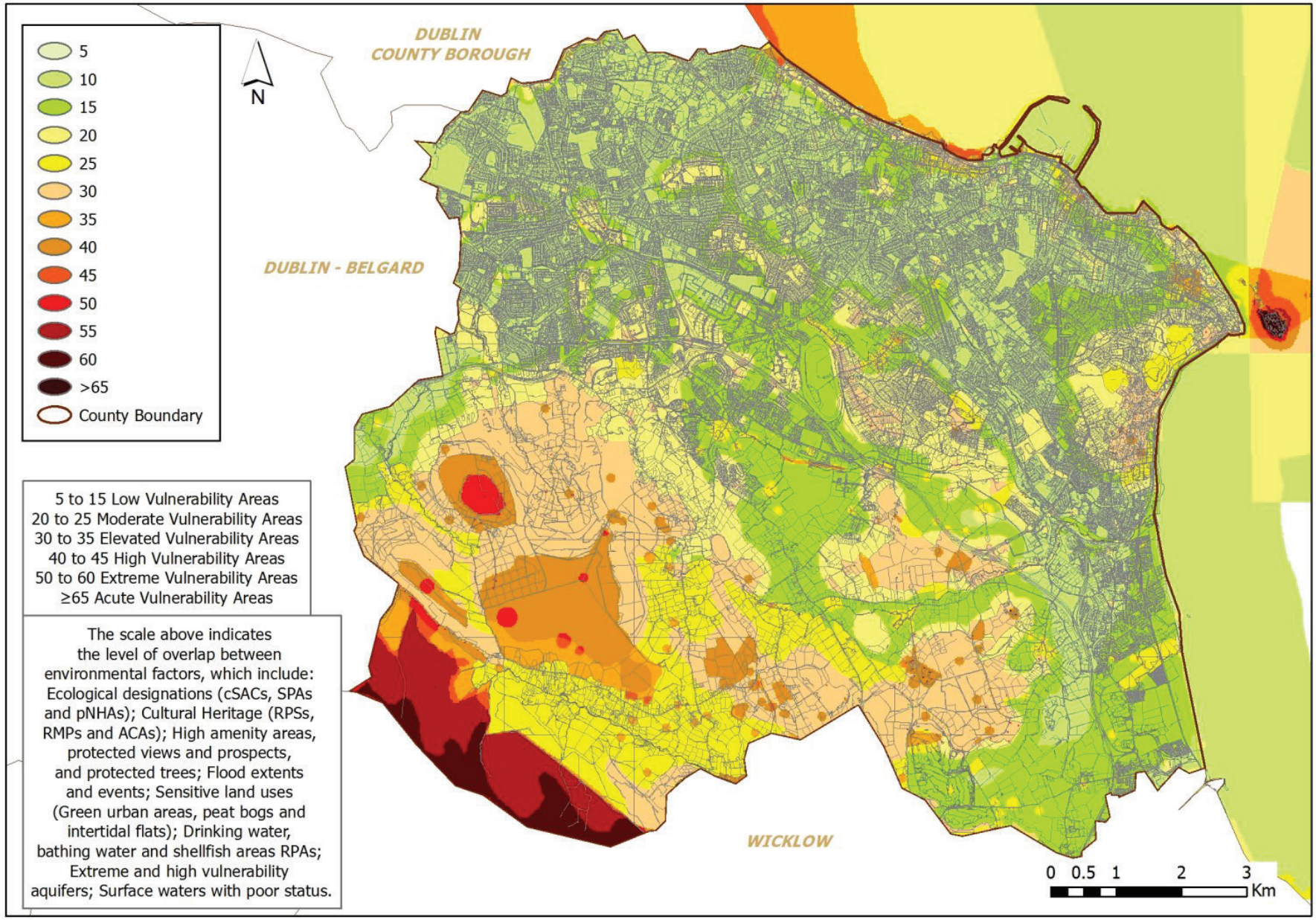

Figure 4.31 Overlay Mapping of Environmental Sensitivities
Sources: Various, as detailed under previous figures