Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council

Codema
Dublin's Energy Agency

STRATEGIC ENVIRONMENTAL
ASSESSMENT ENVIRONMENTAL REPORT

DUBLIN CITY COUNCIL

DRAFT CLIMATE CHANGE ACTION PLAN

2019-2024

CONTENTS

1.1 Purpose of the Non- Technical Summary

This is the Non- Technical Summary of the environmental report for the Strategic Environmental Assessment (SEA) of the Dublin City Council Draft Climate Change Action Plan (CCAP) 2019-2024. The purpose of the SEA is to formally and systematically assess the likely significant effects of implementing a plan or programme, in this instance the above Climate Change Action Plan 2019-2024.

The Environmental Report identifies the significant environmental effects of the plan on the environment and where significant effects are identified, recommends appropriate measures to avoid or reduce such effects. As the plan is being prepared the SEA identifies and influences proposals, particularly through avoiding areas of greatest environmental sensitivity. This Environmental Report forms part of the SEA process, documents the SEA process and is the key consultation document in the SEA process as it facilitates interested parties to comment on the environmental issues associated with the plan itself. This Environmental Report has been prepared under the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I 435 of 2004).

1.2 Background and Context

For the first time, Dublin's four local authorities have joined together to develop Climate Change Action Plans as a collaborative response to the impact that climate change is having, and will continue to have, on the Dublin Region and its citizens. While each plan is unique to its functional area, they are unified in their approach to climate change adaptation and mitigation, and their commitment to lead by example in tackling this global issue.

These CCAPs follow on from the publication of A Strategy for Climate Change Action Plans for the Dublin Local Authorities (DLAs), which was published in January 2017. The strategy used a structured approach that focused on seven key areas (Citizen Engagement, Planning, Energy, Transport, Water, Waste, and Ecosystems & Biodiversity), and set out how the DLAs would develop the four climate change action plans. The action plans will be unique to each local authority area but synchronised in their methodology.

This plan concentrates on the two approaches required to tackle climate change. The first, mitigation, consists of actions that will reduce current and future GHG emissions; examples of these include reductions in energy use, switching to renewable energy sources and carbon sinks. The second approach, adaptation, consists of actions that will reduce the impacts that are already happening now from our changing climate and those that are projected to happen in the future.

The actions in this draft CCAP for Dublin City Council will be continually monitored and updated by a dedicated climate action team working across all Council departments. They will be assisted by the newly established Dublin Metropolitan Climate Action Regional Office, which will ensure that the overall plan is fully updated every five years to reflect latest policy, technology and climate-related impacts. The new office will work with Codema, as technical support and research partner, to ensure that the plans continue to be informed by national and international best practice.

The actions in the CCAP are presented around a number of themes as follows:

- Energy and Buildings
- Transport
- Flood Resilience
- Nature Based Solutions
- Resource Management.

Collectively, these address the four targets of this plan, which are:

- A 33% improvement in the Council's energy efficiency by 2020
- A 40% reduction in the Council's greenhouse gas emissions by 2030
- To make Dublin a climate resilient region, by reducing the impacts of future climate change - related events
- To actively engage and inform citizens on climate change.

2 Contents of SEA Environmental Report

2.1 Approach to the SEA.

The SEA has been carried out alongside the CCAP preparation. Table 1 below sets out the stages in the SEA process and how these relate to the plan preparation so far.

Table 1 Stages in the SEA and Plan preparation process

Stage of SEA	Plan
Stage 1 Screening	Screening is the first stage of SEA to determine if the plan requires full SEA. A SEA and Screening for Appropriate Assessment were carried out in December 2018 and it was determined that the CCAP needed to progress to full SEA and Stage II Appropriate Assessment.
Stage 2 Scoping	The purpose of this stage is to work out what environmental topics and issues should be included in the SEA. The Scoping report was issued to statutory bodies including the EPA and National Parks and Wildlife Service to discuss the potential environmental issues, baseline information, and approach to the SEA.
Stage3 Environmental Report-Current Stage	*This is the current stage of the SEA and the Dublin City CCAP 2019-2024. The Environmental Report tells the story of the CCAP and how environmental considerations have been addressed and included during the draft plan preparation process.* *The screening for appropriate assessment and Natura Impact Report is also discussed in the Environmental Report.* *This report is the main consultation document of the SEA process and hence is on display alongside the plan along with supporting reports.* *Following the public display period there may be changes to the plan and the SEA will also assess these and update the Environmental Report as required.*
Stage 4 SEA Statement	This stage is the final output of the SEA process and tells the story of the SEA process. It is prepared once the plan is finalised and adopted.

2.2 Relationship to other relevant plans and programmes.

Under the SEA Directive, the relationship between the plan and other relevant plans and programmes must be taken into account. A review of the relevant plans and programmes can be found in Appendix B of the SEA ER and a list of same is presented in Chapter 3 of the SEA ER.

The preparation of the plan must be considered within the context of a hierarchy of policies, plans and strategies which include international, national, regional and local level policy documents. These documents set the policy framework within which the plan will operate.

2.3 Current Environmental Baseline.

2.3.1 Population and Human Health

This section provides information on the current population and demographic trends in Dublin City and more broadly at Regional Level. Impacts can arise on people's health and quality of life from a range of environmental factors, often through a combination of environmental impacts such as

landuse, water quality, air quality, noise and transport patterns. Many of these may be exacerbated from climate change effects and impacts.

When compared with their surrounding regions, urban areas are considered to be particularly vulnerable to these climatic changes. This is due to: the high concentrations of population, infrastructure and economic activities located in these areas, the exacerbation of climate impacts by urban-scale phenomena and dependency on surrounding regions for service provision[1].

Based on the Census 2016 data, population density varies throughout the county, with implications in terms of provision of services, ecological connectivity and maximising sustainable transport and landuse. In terms of broad trends however, greater population densities are closer to and in the city centre, with lower population densities to the east and western parts of the City.

Human health can be adversely affected by a range of environmental factors and these include air quality with emissions from transport a particular issue; noise can also adversely affect human health.

2.3.2 Biodiversity, Flora and Fauna

Dublin city is a largely urban environment and is partially built on reclaimed or in-filled lands. The city and its bay, as a natural harbour at the confluence of several river basins, contain a variety of ecosystems that are biologically diverse and of international and national importance for the species which inhabit them and their associations. The ecological value of these areas is a resource for Dublin's citizens and also remarkable for such an urbanised capital city.

The City Council has an objective to promote connectivity of habitats and the enhancement of green corridors of public open space both for biodiversity and amenity values. The system of freshwater streams, rivers, estuarine habitats and beaches that is managed by Dublin City Council provides a network of connected natural areas, part of the green infrastructure of Dublin city. To protect and enhance this natural asset, several management plans have been prepared for all aspects, including biodiversity and flora and fauna, for the Dodder, Tolka, Liffey and North Bull Island. Habitat management plans have also been prepared for a number of city parks, including Bushy Park and Le Fanu Park.

Green infrastructure strategies are recognised as an essential component in European, national and regional policies. The city's green infrastructure network includes historic parks, gardens and Georgian squares of national and international importance. Green infrastructure is recognised as comprising an essential component contributing to quality of life and well-being for residents, in addition to conserving habitat connectivity and reducing habitat fragmentation. To protect and enhance this natural asset, Dublin City Council has prepared several management plans for all aspects, including biodiversity and flora and fauna. These plans include the Dodder, Tolka, Liffey and North Bull Island.

[1] This paragraph is taken from the Urb Adapt Project Summary running till 2019 will use the Dublin Region as a case study that will allow for the integrated assessment and management of current and future climate vulnerabilities within the context of existing climate and non-climate pressures and spatial planning practices. https://urbadapt.com/

There are a number of designated sites in and around Dublin City, including Special Areas of Conservation, Special Protection Areas, proposed Natural Heritage Areas and Ramsar Sites. The Dublin Bay Biosphere is another important biodiversity area and North Bull Island was recognised on the UNESCO World Network of Biosphere Reserves in 1981. North Bull Island is unique among biosphere reserves given its close proximity to a capital city.

2.3.3. Water Resources

Water resources and their quality have a clear interaction and impacts with other environmental parameters, therefore its protection and enhancement is of particular importance.

Dublin city includes rivers such as the Tolka and Liffey, as well as coastal waters, transitional waters and groundwaters. No lakes are present in the city. The Water Framework Directive is the key overarching water protection framework and it uses a catchment based approach. A catchment is an area where water is collected by the natural landscape and flows from source through river, lakes and groundwater to the sea. Dublin City is situated within the Liffey and Dublin Bay Catchment (code: 09). The area of this catchment covers 1,624,42km^2 and supports a total population density of 777 people per km^2.

A strategic flood risk assessment was undertaken as part of the Dublin City Development Plan 2016-202. It is important to note that sea level rise, while an important phenomenon to understand for Dublin City, is only one element that contributes to flooding issues in the City. It is also important to understand the other elements which, when combined with rising sea levels, contribute to flooding. This includes combinations of extreme tide levels, which are made up of astronomic tides and storm surges (fluctuations in water level due to atmospheric pressure, wind speed, seiches, etc) and wave action.

2.3.4 Soil and Geology

The underlying bedrock geology of Dublin is limestone. The soil of Dublin is derived from glacial till of Irish Sea origin, with limestone and shale and is largely comprised of grey-brown podzols. The coast of Dublin has a layer of alluvium overlying the topsoil, which is a result of the low-lying status of the city. This sequence of soils remains only in undisturbed areas of the coast. As Dublin is a very built-up city, much of the topsoil and alluvium have long since been removed.

2.3.5 Cultural Heritage

Dublin is an ancient city with many sites of archaeological, architectural and cultural heritage importance. As a vibrant and expanding city, there is a continuing need to balance day to day operations with protection of the cultural resource that is so much a part of the fabric of Dublin. Dublin City Council is rich in archaeology and has a diverse range of monuments covering a number of historic eras. It is deemed that the plan area is of high archaeological potential due to the potential for the presence of hitherto unknown sub-surface archaeological remains. This determination is based on the presence of substantial archaeological remains from many periods of the past within the city area. Dublin originated first as two separate monastic enclosures (Átha Cliath and Linn Dubh), and then as a fortress for Viking ships on the Liffey.

After the Anglo-Norman invasion of 1170, the walled city expanded reclaiming land at wood quay and large suburbs developed to the north (Oxmantown), to the south and west around Ship Street

and St Patrick's Cathedral and the Liberties. On the outskirts were villages such as Chapelizod, Finglas and Donnybrook, etc.

Much of the medieval city was still intact in 1610 when John Speed mapped it for the first time. During the eighteenth century however, the Wide Streets Commission reshaped the old medieval city, and created a network of main thoroughfares by wholesale demolition or widening of old streets or the creation of entirely new ones.

In addition to archaeological features there is industrial heritage unique to the City as well as architectural heritage, which currently has over 9000 structures on the Record of Protected Structures.

2.3.6 LANDSCAPE

Landscape consists of the public and private landscape of the city. It fulfils an array of environmental, ecological, social, recreational and aesthetic functions of the developing city. Dublin City has significant green spaces through the provision of parks such as the Phoenix Park, St Anne's Park and a number of institutional lands, including Trinity College Dublin.

The city's parks, institutional lands, private gardens and graveyards all contribute significantly to the biodiversity resource in the city. Remaining hedgerows, semi-natural grasslands and trees are of particular importance.

The city's landscape and parks contain significant wildlife resources, including woodland, semi-natural grasslands and remnant hedgerows. In this way, Dublin's city's parks support species of local and national importance, including otters, bats, hedgehogs and kingfishers. The city's parks also play a significant amenity and educational role in the city.

The townscape of the city is as significant as it creates and contributes to the urban character. This varies within the City, from the older medieval areas to Georgian Dublin and newer redevelopment areas such as the Grand Canal Dock.

Key vistas and viewpoints/landmarks in the city also contribute to local character and include the Grand and Royal Canals, coastal views as well as various tall structures including church steeples and landmarks such as Wellingtons Column in the Phoenix Park.

2.3.7 AIR QUALITY AND CLIMATIC FACTORS

The Air Quality Index for health (EPA) provides air quality information with health advice for both the general public and people sensitive to air pollution. The index is displayed on a colour-coded map, updated hourly. The index is based on information from monitoring instruments at representative locations in each region. Dublin City is located within the 'Dublin City' region. Air Quality is generally classified as 'good'.

Adaption and responding to climate change is a key objective the CCAP and the following baseline is taken from the DCC CCAP. The adaptation baseline has identified that the effects of climate change are already impacting Dublin City at a significant rate and are very likely to increase in their frequency and intensity.

The number of days with heavy rainfall has increased and the amount of extreme flooding events has also risen in the last 10 years. Dublin City has also experienced extreme temperatures, as witnessed recently in 2018, with Met Éireann issuing its first ever Status Red warning for snow in February, followed by one of the hottest summers on record during June and July.

The most recently-available information for total emissions in the entire Dublin City area is based on Census 2016 data. Using this data, Codema was able to calculate that the total emissions for the Dublin City area amounted to 2,810,880 tonnes of CO2 equivalent in 2016. The sectors that produced the most emissions were the residential, commercial and transport sectors, accounting for 35%, 33%, and 25% of the total emissions, respectively. Dublin City Council's own emissions accounted for 1.4% of this total, with social housing contributing another 3.3%. This highlights the need for collaboration and action from all stakeholders to tackle the remaining 95.3% of emissions from public and private sector sources in Dublin City.

2.3.8 Material Assets

The Dublin City Council area covers an area of approximately 115 km2 and is populated by 527,612 people. Within its boundaries there are just over 31 km of Irish Rail track and now the Luas Cross city, Red and Green lines traverse parts of the city. The entire rail track within the Dublin City Council area is designated as major rail. It is estimated that there is approximately 2,400 km of footpath within the City Council area. This is of varying quality and it is maintained on a demand/priority basis.

Wastewater is treated in Ringsend Wastewater Treatment Works which discharges into Dublin Bay. The treated waters are treated to a Tertiary standard, which is in compliance with the Urban Wastewater Treatment Directive. The quality of the discharged waters is within the requirements of the Urban Waste Water Treatment Directive.

It is anticipated that Dublin will need a new major water source by 2025, based on projection of growth in the Greater Dublin Area. Irish Water is currently planning the development of a new major water source for the East and Midlands which will include supplying projected demand in the GDA water supply area. Irish Water is also currently implementing a major water conservation programme in order to maximise the availability of treated water from current sources.

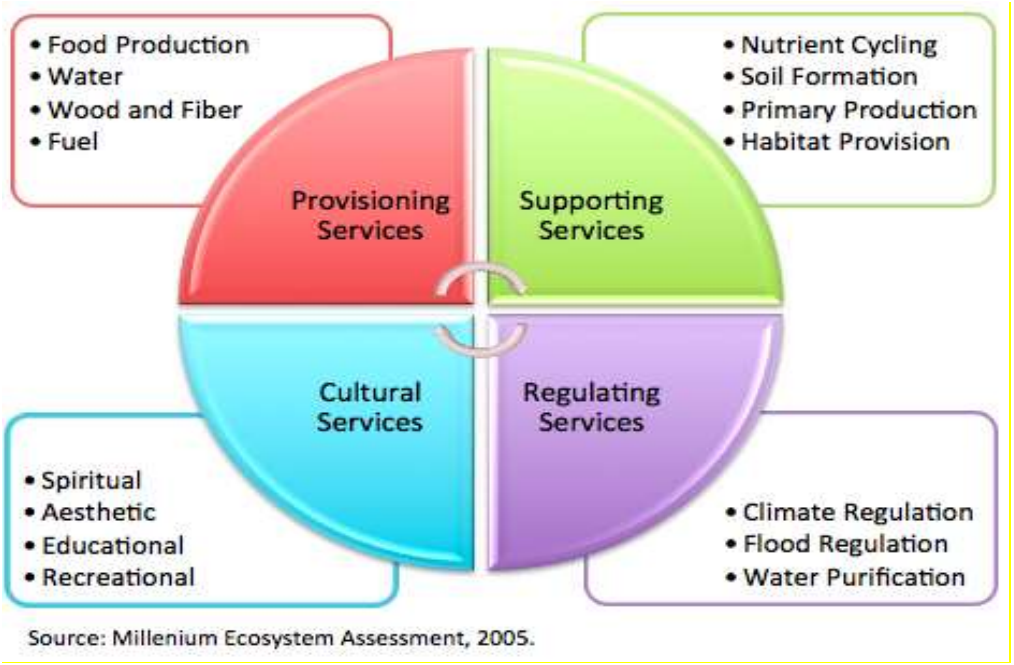
The Regional Waste Management Plan 2015-2024 for the Eastern-Midlands Region encompasses the local authorities: Dublin City, Dún Laoghaire- Rathdown, Fingal, Kildare, Louth, Laois, Longford, Meath, Offaly, Westmeath and Wicklow. The regional plan provides the framework for waste management for the next six years and sets out a range of policies and actions in order to meet the specified mandatory and performance targets.

2.3.9 Inter-relationships

Ecosystem Services

Awareness about the roles and functions of ecosystems has increased in recent years and it can be a useful means to highlight their importance and value services to society. The Economics of Ecosystem Services and Biodiversity (TEEB) study defines ecosystem services as: '*the benefits people receive from ecosystems'*. Humans are ultimately dependant on the natural environment and ecosystem services highlight how these systems provide and interact to create the essential components for human well- being. Four key services are identified for ecosystems and are shown in the following **Figure 1**.

FIGURE 1 ECOSYSTEM SERVICES.

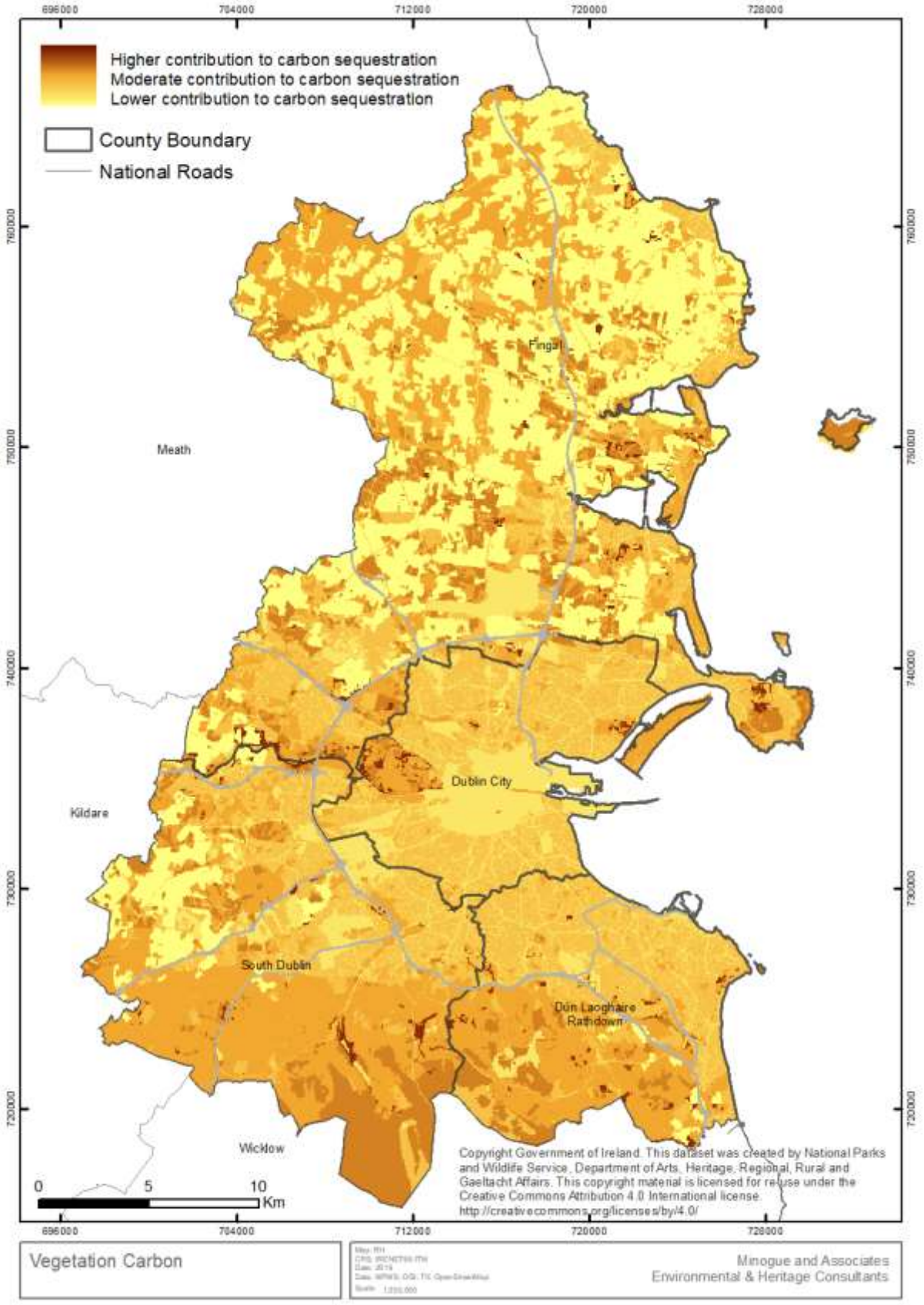


NATIONAL ECOSYSTEM AND ECOSYSTEM SERVICES MAPPING PILOT (NPWS)

The National Parks and Wildlife Service (NPWS) commissioned a short project for a National Ecosystem and Ecosystem Services mapping pilot for a suite of prioritised services based on available data. The project completed in 2016. Maps showing water filtration and storage are included in the SEA ER (chapter Seven) and the map below shows carbon sequestration.

In the context of Dublin City, the assessment demonstrates the importance of the surrounding areas in terms of water storage, filtration and carbon sequestration. The large open space/parkland at Phoenix Park and Bull Island highlight the importance of these areas within the context of providing ecosystem services to Dublin City.

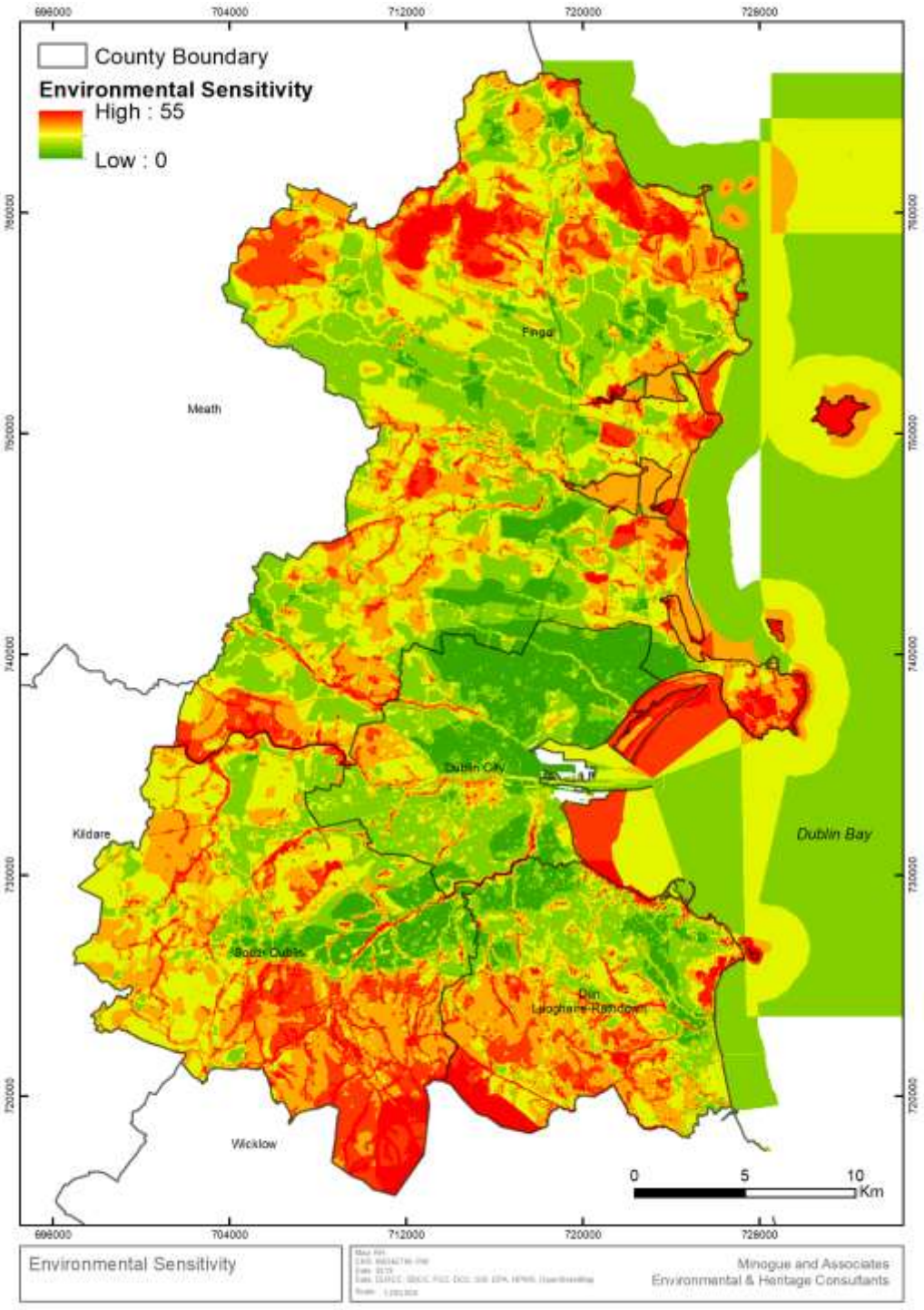
FIGURE 1 ECOSYSTEM SERVICES –CARBON SEQUESTRATION



2.3.10 Environmental Sensitivity.

In accordance with the SEA Directive, the interrelationship between the environmental parameters above must be taken into account. Although all such parameters may be considered interrelated and may impact on each other at some level. The Figure below shows the overall environmental sensitivity for the plan area and sphere of influence, and follows the same approach (i.e.: ranking of environmental parameters) as that used in the Dublin City CDP 2016-2022 SEA process.

FIGURE 3 Environmental sensitivity mapping of the four Dublin Local Authorities



3 Strategic Environmental Objectives and Consideration of Alternatives

3.1 Strategic Environmental Objectives

The purpose of the SEA Objectives is to ensure that the assessment process is transparent and robust and that the CCAP considers and addresses potential environmental effects. SEA Objectives have been set for each of the ten environmental topics identified at the Scoping Stage of the SEA process.

These objectives are derived from the principles identified through the plan, policy and programme review and align where possible with the SEOs developed for the Dublin City Development Plan 2016-2022. Where they differ from the CDP 2016-2022 objectives, the text is shown in italic bold font. The results of this are summarised in a table, called an evaluation matrix (See Chapter Seven and Annex A of the SEA ER).

TABLE 2 STRATEGIC ENVIRONMENTAL OBJECTIVES

SEA Topic	Environmental Protection Objective
Biodiversity Flora and Fauna 	To protect and where appropriate enhance the diversity of habitats, species, ecosystems and geological features.
Population and human health 	To create a sustainable compact city and a high quality healthy safe environment in which to live, work and/or visit.
Water 	To protect and where necessary improve the quality and management of watercourses and groundwater, in compliance with the requirements of all water and habitat based legislation including the river Basin. Management Plan of the Eastern River Basin District.
Air Quality and Climate 	Minimise emissions of pollutants to air associated with development activities and maintain acoustic quality. Contribute to the mitigation of/and adaptation to climate change and implement requirements of Strategic Flood Risk assessment
Soil and Geology 	See Landscape Objective

Material Assets 	To make best use of Dublin city's infrastructure and material assets and to promote the sustainable development of new infrastructure to meet the needs of the city's population.
Cultural Heritage 	To protect and where appropriate enhance the character, diversity and qualities of Dublin city's cultural, including architectural and archaeological, heritage.
Landscape 	To protect and where appropriate enhance the character, diversity and special qualities of Dublin city's landscapes and soils.
	***Interrelationships*** ***Maintain and improve the health of people, ecosystems and natural processes*** ***Actively seek to integrate opportunities for environmental enhancement during adaptation to climate change***

3.2 Consideration of Alternatives

One of the critical roles of the SEA is to facilitate an evaluation of the likely environmental consequences of a range of alternative development scenarios, in this case the Dublin City CCAP 2019-2024. These alternative development scenarios should meet the following considerations:

- Take into account the geographical scope, hierarchy and objectives of the plan –be realistic
- Be based on socio-economic and environmental evidence – be reasonable
- Be capable of being delivered within the plan timeframe and resources –be implementable
- Be technically and institutionally feasible – be viable.

6.2 ALTERNATIVES CONSIDERED

In a *Strategy Towards Climate Change Actions Plans for Dublin 2017*, seven focus areas were identified as having the greatest potential to help the Dublin LAs move towards a zero-carbon society and adapt to the effects of climate change. These focus areas were as follows:

- Water, Waste, Planning, Transport, Energy, Ecosystems and Biodiversity and Citizen Engagement.

The focus areas can have predominately either mitigation or adaptation solutions, or both. For example, the Energy focus area mainly concerns mitigation (ie. reducing the use of fossil fuels and their associated CO2 emissions), while Water largely focuses on adapting to changes that are occurring or will occur in the near future due to climate change. Meanwhile, the Citizen & Stakeholder Engagement focus area concerns both mitigation and adaptation.

The aim of the CCAP is to work with the other Dublin local authorities in a co-ordinated manner to achieve the actions identified as being capable of implementing over a Five Year Period whilst also contributing to both mitigation and adapting to climate change. The following alternatives were considered:

- Alternative 1: Do-Nothing (rely CDP policies and objectives to address and adapt to climate change)
- Alternative 2: Prioritise largest greenhouse gas emission sectors –Energy and Transport
- Alternative 3: Approach the priority areas in a balanced manner to provide for both responses to climate change impacts (adaptation) and reduce greenhouse gas emissions mitigation).

In terms of all SEOs, Alternative 3 is identified as creating most positive interactions as it provides greater environmental performance overall and also allows for a greater environmental gains, than may be achieved through Alternatives 2 and 1. In addition, the multi- faceted approach contributes to greater co-benefits by providing for a wider range of environmental effects particularly around nature based solutions and resource management. The inclusion of measures for citizen engagement and awareness raising through the CCAP option is also positive for a number of SEOs.

4 Assessment of Significant Effects and Mitigation Measures

4.1 Significant Effects

Population and Human health: Many of the actions identified in the CCAP give rise to long term positive effects on population and human health both by responding and adapting to the impacts of climate change, and also reducing greenhouse gas emissions through a series of measures.

Reflecting the opportunity for co-benefits of the CCAP, measures around energy efficiency and district heating opportunities can help address fuel poverty in relation to vulnerable individuals as well as the chance to reuse energy from within the local area, for example Energy: Action 2 Requirement for all new developments to be district heating-enabled in Poolbeg West, North Lotts and Grand Canal SDZs.

Biodiversity, Flora and Fauna: The promotion of a nature based measures and resource management in particular along with blue and green infrastructure actions all strengthen overall protection of biodiversity resources and the Biodiversity SEOS.

Mapping trees in the county (Nature Based Solutions Action 14), Collect data to inform preparation of a list of habitats and species in Dublin city vulnerable to climate change (Action 7)), as well as Action 1 Regional working group on nature based solutions and joint action plans to protect native habitats and species across all 4 DLS(Action 2) are examples of actions that are long term positive and consistent with these SEOs.

Water Resources: The Dublin City CDP 2016-2022 already includes a range of provisions and measures to address and minimise the above effects, including measures around green infrastructure, flood risk management and development control.

The CCAP however further enhances and strengthens these through the flood resilience actions and nature based solutions in particular. Additional tree planting and a focus on riparian habitat (Actions 3 *Establish a cross-departmental Trees and SUDS Working Group to promote and pilot water sensitive urban design incorporating urban tree planting* and 35 *Study impacts and benefits of increased buffer distances to watercourses*) provide for positive effects as they reduce soil run off and allow for water attenuation and filtration. Again this provides for longer, positive effects associated with linear habitat creation and ecological connectivity.

Soil and Geology: Soil quality and function may be enhanced through particular measures associated with flood resilience, nature based solutions and resource management in particular.

Awareness raising around illegal dumping (Action 12) and Action 19 leaf composting can generate positive effects on soil through enhancement of the resource and a more sustainable approach to enriching soil. Action 38 Prepare an analysis of soil sealing in Dublin City to determine levels of permeability is particularly important given the largely urban character of the city's soils and its functions in terms of carbon sequestration and water attenuation, as well as its contribution to biodiversity.

Air Quality and Climate: Overall the CCAP will contribute positively to climate change adaptation through the following:

- Blue and green infrastructure giving rise to increased surface water storage and potential carbon sequestration

- Focus on energy efficiency and innovation as seen through the actions identified in the Energy Theme, examples include

- Action 4 provides for an evidence based climate change chapter in the County Development Plan, both of which will allow for policy responses and in the CDP context, landuse zoning responses based on the evidence prepared.

- Other energy related measures including Energy efficiency works in 30 Council owned and operated buildings (Action 10) are all identified as positive in relation to this SEO.

Key measures relating to behavioural change around transport and the increase in walking/cycling and public transport measures are essential in addressing transport emissions over the lifetime of the CCAP and beyond.

Recognising the ecosystems functions of soil, water and biodiversity is a key element in the Nature Based solutions theme and is an important acknowledgement that also provides for positive effects across a number of SEOs.

The CCAP includes targets relating to 40% reduction in the councils' Greenhouse Gas Emissions by 2030 (primarily through lighting and energy measures), a 33% improvement in the councils energy efficiency by 2020. However the CCAP also acknowledges that the council's outputs are relatively minor given the wider sectoral emissions in the county and this is why many of measures relate to the council leading on climate action, promoting behavioural change, facilitating sustainable transport options, promoting increased energy efficiency and supporting nature based solutions and citizen engagement.

Cultural Heritage: Archaeology and Built heritage features are present throughout the plan area, and in particular those archaeological or built heritage features associated with the coastline and Dublin Bay may be particularly vulnerable to climate change effects.

The concentration of built heritage features and historic settlements on the coastline increases their vulnerability to the effects of climate change.

Cultural heritage is not often considered or captured adequately in coastal zone management planning and this can give rise to adverse effects on cultural heritage.

Material Assets: Transport and Flood Resilience in particular provide for mitigation and adaptation with a view to minimising adverse effects of climate change on material assets, and also responding and facilitating behavioural and modal change in energy use and transport. Examples of these include the following:

- Energy: Action 1: Create an Energy Masterplan for the Dublin Region,

- Transport: Action 27 Develop and extend cycle network; Action 45 Sustainable Transport Hubs

- Flood Resilience: whilst most of the measures here mitigate and adapt to climate change, with accompanying positive effects on material assets SEOs, Actions 16 Develop template to capture impacts, response and costs for all major climate events and 18 are recommended for mitigation to allow for the inclusion of 'environmental externalities' in any costing exercise, as well as promotion of natural flood measures as a priority in any updated guidelines or policies.

- Actions under Resource Management are also identified as generating positive, long terms effects particularly around the circular economy, reuse and awareness raising around food waste and recycling.

Landscape: Long term positive effects are identified for the CCAP and landscape primarily through the nature based solutions, public realm enhancement, green and blue infrastructure, increased tree planting etc.

Many of the measures in the CCAP require a landscape level response such as Regional Flood Plain management guidelines, recognition of green and blue infrastructure and corridors and this an important approach to take when responding to climate change.

In combination and cumulative effects: Cumulatively and in combination, several of the CCAP Actions encourage a modal shift and in turn gives rise to indirect positive effects, for example by creating more physical activity in terms of travel to work and school, positively affecting air quality with accompanying benefits to both population and human health . In addition, this can create a reduction in emissions associated with Particulate Matter and Nitrogen Dioxide. This benefits both human health as well as Biodiversity, flora and fauna and surface water features.

The majority of the Flood Resilient measures are identified as being consistent and positive across all SEOs, in particular measures that promote natural based solutions such as tree planting and SUDs are all positive across all parameters and can provide multi-functional benefits in the landscape.

In combination and cumulative effects are particularly relevant to the Nature Based solutions actions which together create long term positive effects across Population, Landscape, Biodiversity, Soil and Geology, Water and Material Assets whilst responding to climate change effects.

The resource management is also a critical theme as it promotes reduction and reuse and measures around illegal dumping and leaf composting all interact to generate positive effects.

Threaded throughout the CCAP is the theme of citizen engagement and awareness raising and this is critical to both inform, educate and engage citizens in relation to responding to climate change, whilst also identifying positive measures. Many of the engagement actions should increase public awareness and a sense of responsibility, collective and individual action in addressing and adapting to climate change. Positive in combination effects are identified for human health around modal shifts, and green infrastructure, behavioural change, tree planting and responding to flood risk.

4.2 Mitigation Measures

Although most of the actions are identified as being consistent with the SEOs, a small number of actions mainly around Transport and Flood Resilience were identified as meriting additional mitigation measures. These are provided in Table 2 below:

TABLE 2 MITIGATION MEASURES

	Mitigation Measure	**Included in CCAP Yes/no?**
Overarching measure	**An integrated approach to decision making in relation to these climate change actions is recommended.**	**These will be included in the finalised CCAP.**
Flood Resilience	**Recommended text in green**	
3	**Prepare and** Implement an **Integrated** Coastal Zone Management Plan **that addresses natural and cultural heritage and aligns with the Marine Spatial Planning Directive**	
7	Develop template to capture impacts, response and costs **(including ecosystem services/natural capital costs)** for all major climate events	

	Mitigation Measure	Included in CCAP Yes/no?
10	Update DLA urban drainage and flooding policies for current knowledge of flood risk and the latest best practice in drainage design **promoting natural flood measures as a priority**	
New text before Actions 11- 18 in Flood Resilience Section	The following flood storage actions will incorporate nature based solutions and biodiversity enhancement measures where possible.(Refers to actions 11 to 18)	
New measures to be consistent with neighbouring Local Authorities	***Communication and awareness campaigns on flood risk management and natural flood management measures***	

5 MONITORING

It is proposed, in accordance with Article 10 of the SEA Directive, to base monitoring on a series of indicators which measure changes in the environment, especially changes which are critical in terms of environmental quality, for example water pollution levels. Monitoring will focus on the aspects of the environment that are likely to be significantly impacted upon by the implementation of the CCAP 2019-2024.

The monitoring programme will consist of an assessment of the relevant indicators and targets against the data relating to each environmental component. Similarly, monitoring will be carried out frequently to ensure that any changes to the environment can be identified.

Overall, this Climate Change Action Plan will be monitored and updated on an annual basis, with a review and revision every five years. This draft of the Climate Change Action Plan was developed through DCC's Climate Change Sub-Committee of the Environment SPC and approved by Environment SPC.

The Executive Manager of the Environment & Transportation Department will report on progress to the SPC annually and the SPC will monitor progress towards the set targets. Every five years there will be a full review and revision of the plan taking into account demographic, technical and other changes that have occurred and any new targets that have been introduced.

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
Population and Human Health	To create a sustainable compact city and a high quality healthy safe environment in which to live, work and/or visit.	Sustainable densities achieved in new residential/ mixed use schemes	Average density of new residential development	Every 2 years	Planning and Property Development Department (PPDD)
		Increase the number of residential properties	Percentage increase of residential properties	Every 2 years	(PPDD)
		Improved access to community and recreational facilities	Percentage increase in the number of schools/ crèches/community parks/sports facilities and primary health centres	Every 2 years	(PPDD)
Biodiversity, Flora and Fauna	To protect and where appropriate enhance the diversity of habitats, species, ecosystems and geological features.	Maintain the favourable conservation status of all habitats and species which are within designated sites protected under national and international legislation and also habitats and species outside of designated sites.	Number of developments granted planning permission within designated sites.	Every 2 years	(PPDD) Parks and Landscape Services
			Number of Natura Impact Statements submitted to Dublin City Council	Every 2 years	Parks and Landscape Services
			Percentage increase or decrease of bat and otter populations in Dublin city	Every 2 years	Parks and Landscape Services
		Deliver the objectives of	Number of objectives/ policy	Every 2	Parks and

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
		the Dublin City Biodiversity Action Plan 2015–2020	actions delivered by the biodiversity plan	years	Landscape Services
		Implementation of the actions from the green infrastructure strategy for Dublin city	Number of projects delivered by the green infrastructure strategy	Every 2 years	(PPDD) Parks and Landscape Services
			Totals of, or reduction in the quantum of greenfield lands; length of linked green corridors		(PPDD) Parks and Landscape Services
		Control and protect against the spread of noxious weeds and invasive species	Number of projects within the city that have identified noxious weeds and invasive species	Every 2 years	(PPDD) Parks and Landscape Services
		Achieve the objectives of the Tree Strategy and Canopy Survey for Dublin city	Percentage increase of tree planting within Dublin city	Every 2 years	(PPDD) Parks and Landscape Services
			Tree canopy cover within the city area to contribute to carbon sequestration (no. of trees)	Every 2 years	Parks and Landscape Services
		Implementation of setback/	Number of planning	Every 2	(PPDD)

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
		buffer zones of 10 m for development along watercourses	applications adhering to the 10 m buffer zone setback	years	
		Increased provision for soft landscaping in existing and new developments	Amount of open space provided in planning applications for Z10 and Z15 lands	Every 2 years	(PPDD)
Climatic Factors Air Quality	Contribute to the mitigation of/ and adaptation to climate change and implement requirements of Strategic Flood Risk assessment. Minimise emissions of pollutants to air associated with development activities and maintain acoustic quality.	Maintain air quality status and meet value targets for named pollutants in line with Air Quality Framework Directives	Values of monitored pollutants in the air, including the levels of Nitrogen Oxides (NO_x) and Particulate matter (PM_{10}) not breach regulation limits	Every 2 years	Roads and Traffic – Noise and Air Section
		Decrease greenhouse gas emissions in line with national targets	Average energy consumption of new residential housing stock, tonnes of CO_2/ year	Every 2 years	Energy Division
		Increase energy efficiency (reduce energy waste) from renewable energy sources in line with the National Energy Efficiency Action Plan	Number of objectives implemented from Dublin City Energy Strategy	Every 2 years	Energy Division
			Number of permitted developments that include district heating	Every 2 years	Energy Division

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
			Number of permitted developments incorporating solar renewables	Every 2 years	Energy Division
			Number of (social) housing units, public buildings and community centres connected to district and group heating systems	Every 2 years	Energy Division
		Produce noise maps for Dublin city and ensure they are updated	Number of zonings that conflict in relation to acoustic increases	Every 2 years	Roads and Traffic – Noise and Air Section
		Increase modal shift to public transport, walking and cycling	Percentage/quantum of population travelling to work by public transport, walking and/ or cycling.	Every 2 years	Roads and Traffic
		Compliance with the requirements of the Development Plan's Strategic Flood Risk Assessment	Percentage of planning applications compliant with the SFRA	Every 2 years	(PPDD) Environment and Engineering – Water Division
		Compliance with the OPW's Guidelines for Planning Authorities – The Planning	Percentage of planning applications incorporating flood risk assessment and	Every 2 years	(PPDD) Environment and Engineering –

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
		System and Flood Risk Management	conditions requiring appropriate flood resilient measures for new developments		Water Division
		Implement Sustainable Urban Drainage Systems in all new developments	Number of Sustainable Urban Drainage Systems implemented in new planning applications	Every 2 years	(PPDD) Environment and Engineering – Water Division
Water	To protect and where necessary improve the quality and management of watercourses and groundwater, in compliance with the requirements of all water and habitat based legislation, including the River Basin Management Plan of the Eastern River Basin District.	Achieve and maintain good status of all surface water bodies.	Improvement in Status of Water Body as per RBMP	Every 2 years	Environment and Engineering – Water Division
		All designated bathing waters to comply with the requirements of the Bathing Water Quality Regulations 2008 (S.I. 79 of 2008)	Bathing waters comply with requirements of Bathing Water Regulations	Every 2 years	Environment and Engineering – Water Division
		Identify and provide Surface Water pipelines as appropriate	Lengths of new Surface Water pipeline installed	Every 2 years	Environment and Engineering – Water Division
Material Assets	To make best use of Dublin city's infrastructure and material assets and to promote the sustainable	Develop public transport, cycleways and road infrastructure to facilitate sustainable growth and	Percentage change in commuting modal shift to sustainable travel modes	Every 2 years	Environment and Transportation

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
	development of new infrastructure to meet the needs of the city's population	travel patterns			
		Extend and improve the cycling and walking network	Number of new cycling and walking schemes implemented	Every 2 years	Environment and Transportation
		Comply with the Eastern Midlands Waste Management Plan and operate sustainable waste management practices	Quantum of residential and commercial waste reused and recycled	Every 2 years	Engineering – Waste Management
		Protect and enhance green infrastructure	Number of greenfield sites developed	Every 2 years	(PPDD) Parks and Landscape Services
Cultural Heritage	To protect and where appropriate enhance the character, diversity and qualities of Dublin city's cultural, including architectural and archaeological, heritage	No loss or adverse impact on the fabric or setting of monuments on the Record of Monuments	Number of planning applications with archaeological conditions that were complied with	Every 2 years	(PPDD)
		No loss of or adverse impact on the architectural heritage value or setting of protected structures and monuments	Loss of, or adverse impact on protected structures, architectural conservation areas or NIAH structures	Every 2 years	(PPDD) City Architects – Conservation
			Number of archaeological sites with archaeological	Every 2 years	(PPDD) City Architects –

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
			conditions attached		Conservation
		No loss of or adverse impact on structures recorded on the National Inventory of Architectural Heritage	Number of protected structures put at risk or on the derelict sites register	Every 2 years	(PPDD) City Architects – Conservation
		Revision of the Dublin Heritage Plan 2002–2006, to ensure enhancement of key sites	Number of conservation plans implemented through the Dublin Heritage Plan	Every 2 years	(PPDD) City Architects – Conservation City Archaeologist
			Number of proposed plans and schemes screened/assessed by the Conservation Officer for the City and City Archaeologist	Every 2 years	(PPDD) City Architects – Conservation City Archaeologist
			Number of Architectural Conservation Areas designated	Every 2 years	(PPDD) City Architects – Conservation
Landscape and Soils	To protect and where appropriate enhance the character, diversity and special qualities of Dublin	Develop new areas of open space and increase number of trees	Number of new parks/ open spaces, change in area of the parks and number of trees planted	Every 2 years	(PPDD) Parks and Landscape Services

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
	city's landscapes and soils and geological features	Create a well-connected city landscape consisting of linear connections (e.g. river corridors and networks)	Length of existing and new linked landscape corridors	Every 2 years	(PPDD) Parks and Landscape Services
		Develop brownfield lands and vacant sites	Total area of brownfield lands and vacant sites developed	Every 2 years	(PPDD) Parks and Landscape Services
Inter-relationships	***Maintain and improve the health of people, ecosystems and natural processes*** ***Actively seek to integrate opportunities for environmental enhancement during adaptation to climate change***	Integration of blue and green infrastructure measures including in approved planning applications within Dublin City Council including SUDS, Integrated Wetlands, Hedgerows, Native tree planting scheme	***Blue and Green Infrastructure measures implemented over lifetime of plan*** Number of Blue infrastructure features included in development		

5.2 CONCLUSION

This SEA Environmental Report demonstrates how environmental parameters have been addressed in the plan preparation process. Consultation has been undertaken for the Scoping of this Environmental Report and further opportunity to comment on the CCAP will be possible over the forthcoming weeks.

The SEA and Appropriate Assessment processes have been undertaken in line with the Planning and Development (Strategic Environmental Assessment) Regulations 2004 to 2011 (as amended). Subject to the full and proper implementation of the mitigation measures outlined in this SEA Environmental Report and the Proposed CCAP, it is considered that significant adverse impacts on the environment will be avoided.

This report has been prepared by Minogue & Associates with all reasonable skill, care and diligence. Information report herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is prepared for Dublin City Council and we accept no responsibility to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

Version	Prepared by	Reviewed
Draft 21.01.2019	R Minogue MCIEEM	
Draft 2 4.02.2019	R Minogue	RM and DCC

SEA Environmental Report Contents

1 INTRODUCTION

1.1 PURPOSE OF THIS SEA ENVIRONMENTAL REPORT

This Environmental Report has been prepared as part of the Strategic Environmental Assessment (SEA) of the Climate Change Action Plan 2019-2024 (CCAP) prepared by Codema, the Dublin Energy Agency and Dublin City Council.

It sets out how the SEA has been undertaken and presents the findings of the assessment of the actions on the CCAP together with its' reasonable alternatives.

The Environmental Report complies with the requirements of the Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (the SEA Directive) as implemented in Ireland through Statutory Instrument (SI) No.435 of 2004 European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (as amended).

These regulations are a statutory requirement for plans or programmes which could have significant environmental effects, and the assessment process aims to identify where there are potential effects and how any negative effects might be mitigated.

The Environmental Report is required to include information that may be reasonably required, taking into account the following:

- Current knowledge and methods of assessment;
- Content and level of detail in the draft CCAP;
- Stage of the proposed CCAP in the decision-making process and
- The extent to which certain matters are more appropriately assessed at different levels in the decision-making process in order to avoid duplication of environmental assessment.

It is important to note that many of the actions included in the CCAP for Dublin City are identified as generating positive effects across a number of SEA parameters. The SEA Screening report included in the SEA Scoping Report of December 2018 supported this assessment. A small number of actions, primarily around transport proposals were identified through the screening for Appropriate Assessment as potentially giving rise to likely significant effects in the absence of mitigation, and this therefore triggered the requirement for a Stage II Appropriate Assessment and full Strategic Environmental Assessment.

1.2 SCALE, NATURE AND LOCATION OF DUBLIN CITY CCAP

For the first time, Dublin's four local authorities have joined together to develop Climate Change Action Plans as a collaborative response to the impact that climate change is having, and will continue to have, on the Dublin Region and its citizens. While each plan is unique to its functional area, they are unified in their approach to climate change adaptation and mitigation, and their commitment to lead by example in tackling this global issue.

These CCAPs follow on from the publication of A Strategy for Climate Change Action Plans for the Dublin Local Authorities (DLAs), which was published in January 2017. The strategy used a structured approach that focused on seven key areas (Citizen Engagement, Planning, Energy, Transport, Water, Waste, and Ecosystems & Biodiversity), and set out how the DLAs would develop the four climate change action plans. The action plans will be unique to each local authority area but synchronised in their methodology.

This plan concentrates on the two approaches required to tackle climate change. The first, mitigation, consists of actions that will reduce current and future GHG emissions; examples of these include reductions in energy use, switching to renewable energy sources and carbon sinks. The second approach, adaptation, consists of actions that will reduce the impacts that are already happening now from our changing climate and those that are projected to happen in the future.

The actions in this draft CCAP for Dublin City Council will be continually monitored and updated by a dedicated climate action team working across all Council departments. They will be assisted by the newly established Dublin Metropolitan Climate Action Regional Office, which will ensure that the overall plan is fully updated every five years to reflect latest policy, technology and climate-related impacts. The new office will work with Codema, as technical support and research partner, to ensure that the plans continue to be informed by national and international best practice.

The actions in the CCAP are presented around a number of themes as follows:

- Energy and Buildings
- Transport
- Flood Resilience
- Nature Based Solutions
- Resource Management.

Collectively, these collectively address the four targets of this plan, which are:

- A 33% improvement in the Council's energy efficiency by 2020
- A 40% reduction in the Council's greenhouse gas emissions by 2030
- To make Dublin a climate resilient region, by reducing the impacts of future climate change -related events
- To actively engage and inform citizens on climate change.

As such, this CCAP encompasses the functional and administrative area of Dublin City Council.

1.3 Strategic Environmental Assessment

Under Directive 2001/42/EC - Assessment of Effects of Certain Plans and Programmes on the Environment, certain plans and programmes require an environmental assessment. This is known as the Strategic Environmental Assessment (SEA) Directive. Article 1 of this Directive states that its objective is:

> *'to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development.'*

1.3.1 Structure and Preparation of this Environmental Report

Regulations contained in Schedule 2B of Statutory Instrument (S.I.) 436 of 2004(as amended) details the information to be contained in an Environmental Report. The following Table 1 lists the information required and details where this information is contained in this Environmental Report.

TABLE 1 INFORMATION REQUIRED TO BE CONTAINED IN AN ENVIRONMENTAL REPORT.

Schedule 2B of Statutory Instrument 436 of 2004	Addressed in this SEA ER
(a) an outline of the contents and main objectives of the plan and relationship with other relevant plans	Chapter One Introduction and Chapter Two Methodology outlines contents and main objectives Chapter Three details the relationship with other relevant plans
(b) the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan	Chapter Four Baseline Environment provides this information
(c) the environmental characteristics of areas likely to be significantly affected	Chapter Four Baseline Environment provides this information
(d) any Issues and Threats problems which are relevant to the plan including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to the Birds Directive or Habitats Directive	Chapter Four Baseline Environment provides this information
(e) the environmental protection objectives, established at international, European Union or national level, which are relevant to the plan and the way those objectives and any environmental	Chapter Five: SEA Objectives provides this information

considerations have been taken into account during its preparation	
(f) the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors	Chapter Seven, Significant Effects on the Environment provides this information
(g) the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan	Chapter Eight, Mitigation Measures provides this information
(h) an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information	Chapter Six, Alternatives Considered provides this information and difficulties encountered are listed at the end of Chapter Two, Baseline Environment.
(i) a description of the measures envisaged concerning monitoring of the significant environmental effects of implementation of the plan	Chapter Nine, Monitoring provides this information
(j) a non-technical summary of the information provided under the above headings	This is provided as a separate document at the front of this publication

1.4 Report Preparation

The SEA Team worked with the DCC technical staff team and other specialists. The following consultants prepared this SEA ER:

- Ruth Minogue MCIEEM, AILI, (BSoc Sc) Social Anthropology, University of Manchester 1996, MA (Econ) Environment and Development, University of Manchester 1998, Dip Field Ecology, University College Cork 2003, ongoing CPD including certificate in Health Impact Assessment (2012) and diploma in Planning and Environmental Law (2017);

- Pat Doherty MCIEEM, MSc in Applied Environmental Science (Ecology), University College Dublin, 2003;BSc (Honours) in Environmental Earth Science, University of Wales, Aberystwyth, 2000; ongoing CDP including Habitat Assessment (NVC) and flora and fauna identification through IEEM, and
- Dr Ronan Hennessey, PhD Earth and Ocean Sciences, Higher Diploma in Remote Sensing and Geographical Information Systems, BSc Earth Sciences.

2 Approach to Strategic Environmental Assessment

2.1 Introduction

This chapter presents the SEA methodology in detail and outlines the steps required for SEA. The methodology used to carry out the SEA of the plan reflects the requirements of the SEA regulations and available guidance on undertaking SEA in Ireland, including:

- SEA Methodologies for Plans and Programmes in Ireland – Synthesis Report Environmental Protection Agency (EPA), 2003;
- Implementation of SEA Directive (2001/42/EC) Assessment of the Effects of Certain Plans and Programmes on the Environment – Guidelines for Regional Authorities and Planning Authorities - published by the Department of the Environment, Heritage and Local Government, 2004;
- Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI 436 and SI 435 of 2004);
- Planning and Development (Strategic Environmental Assessment) Regulations 2011 (S.I. No. 201 of 2011);
- Planning and Development (Environmental Assessment of Certain Plans and Programmes) (S.I No 200 of 2011);
- SEA Process Checklist Consultation Draft 2008, EPA 2008;
- Circular Letter PSSP 6/2011 Further Transposition of EU Directive 2001/42/EC on Strategic Environmental Assessment;
- Guidance on integrating climate change and biodiversity into Strategic Environmental Assessment European Union 2013;
- SEA Resource Manual for Local and Regional Authorities, Draft Version, 2013;
- Integrating Climate Change into Strategic Environmental Assessment in Ireland – A Guidance Note, EPA, 2015;
- Developing and assessing alternatives in Strategic Environmental Assessment, EPA, 2015 and
- SEA of Local Authority Land Use Plans - EPA Recommendations and Resources (Version May 2018).

2.2 Stages in the SEA Process

The steps involved in SEA are as follows:

- Screening (determining whether or not SEA is required).
- Scoping (determining the range of environmental issues to be covered by the SEA).
- The preparation of an Environmental Report (***current stage***)
- The carrying out of consultations.
- The integration of environmental considerations into the Plan or Programme.
- The publication of information on the decision (SEA Statement).

2.2.1 Screening

The SEA Regulations state that SEA is mandatory for certain plans while screening for SEA is required for other plans. A Screening assessment was undertaken and it determined the requirement to progress to full SEA. In conjunction with the SEA Screening, a screening under Article 6 (3) of the EU Habitats Directive has also been prepared and should be read in conjunction with the CCAP and this SEA ER.

2.2.2 SCOPING

The purpose of the SEA Scoping report is to identify the scope of the SEA and ensure that relevant data and environmental topics are included in the SEA. The Scoping report was issued to the statutory environmental authorities consultees in December 2018 for comment. The table below summarises the main issues raised by consultees and the SEA response to same.

TABLE 2 SCOPING SUBMISSIONS-

Consultee	Key Issue Raised	SEA Response
Scientific Officer, SEA Section Office of Evidence and Assessment. Environmental Protection Agency, Regional Inspectorate, Inniscarra, County Cork		
	We welcome the preparation of the Plan, which sets out a clear set of actions to be taken by Dublin City Council, in collaboration with other key stakeholders, over the next five years. The inclusion of clear targets will facilitate monitoring and reporting on the Plan implementation, which should in turn help to drive delivery.	Noted
	We recognise the fundamental importance of ensuring that the National Transition Objective is underpinned by a clean, healthy and well-protected environment. Considering this, it is important to develop and implement the Plan within the context of a wider and more integrated approach to environmental protection. The SEA should play a key role in ensuring that this is achieved and should inform decision-making around assessment and selection of actions and measures.	Noted, the SEA and AA have helped to inform plan preparation and please see Chapter 8 Mitigation in particular
	The SEA should also assist in identifying ways to maximise the potential co-benefits of climate-related measures for air quality, human health, biodiversity, water quality and other interrelated areas (i.e. win-win solutions). A key role of SEA is in assessing and informing the selection and refinement of actions and measures that maximise the co- benefits of climate actions for the wider environment and society, should be highlighted in the SEA Report and the Plan.	Noted, in particular certain actions in each theme already provide co-benefits and the SEA has provided additional mitigation to further enhance certain actions please see CCAP and Chapter 8 Mitigation of this SEA ER

	Relevant Plans and Programmes You should ensure that the Plan aligns with national commitments on climate change mitigation and adaptation. Actions and measures proposed should be consistent with the National Policy Position on Climate Action and Low Carbon Development, the National Mitigation Plan and the National Adaptation Framework, as well as considering any relevant sectoral and regional adaption plans. We recommend including a flow diagram or/ schematic, illustrating where the Plan fits within the hierarchy of land-use, climate and related plans	Noted and agreed, in response to this comment the SEA ER included a table that highlights consistency with these plans and programmes and also provides a preliminary schematic to illustrate the hierarchy of plans and programmes. Please see Chapter 3.
	It would be useful to explain the relevance of the various plans listed in section 2 of the SEA Scoping Report to the CCAP, for example by way of an additional column. Reference to the Draft Regional Spatial Economic Strategy, currently at consultation, should be included.	Noted and agreed. Chapter 3 has been amended to provide this and a more detailed overview of key relevant plans and programmes is provided in Annex B of this SEA ER.
	Greenhouse Gas Emissions In preparing the Plan and SEA, the direct and indirect impacts of the Plan on greenhouse gas emissions and removals should be assessed. The Agency's most recent projections report Ireland's Greenhouse Gas Emissions Projections for 2017-2035 (EPA, 2018) should be taken into account.	Noted. With support from the Sustainable Energy Authority of Ireland (SEAI), Codema developed an energy and emissions baseline, which shows the current level of emissions and energy efficiency for both DCC's own operations and emissions for the whole of Dublin City. Consideration of significant effects in Chapter Seven of this SEA ER discusses this point.
	The National Mitigation Plan (NMP) identifies 106 actions to decarbonise electricity generation, the built environment and transport and to move towards carbon neutrality for agriculture, forest and land use sectors. The Plan should integrate and align with the relevant actions in the NMP, as appropriate.	Noted, this SEA ER addresses this in Table 3 and shows where the Dublin City CCAP actions are consistent with the National Mitigation Plan. Please note that many of the actions in the National Mitigation Plan are identified at central government level rather than local authority.
	Adaptation	Codema carried out an adaptation risk assessment on behalf of DCC,

	In preparing the Plan and SEA, you should consider how the impacts of climate change, individually and in combination, are likely to influence the implementation of the Plan. The Plan should look to improve resilience of existing and planned critical infrastructure, systems and procedures to the effects and variability of climate change. Recent extreme weather events could be useful to assist in identifying areas where for further work is needed to improve resilience, e.g. the resilience of critical water service infrastructure to flooding and drought. The Plan should include appropriate adaptation measures that can be implemented either directly or through relevant land use plans and/or specific plans e.g. Flood Risk Management Plans, Integrated Coastal Zone Management Plans etc. The Plan will also help inform local authority land use and transport planning within the county. Additional aspects to consider may include changes in native species and habitats and the spread of invasive species, pests and pathogens.	which identifies and assesses the current climate change risks facing Dublin City. Research into people's attitudes and awareness was used in order to inform the stakeholder engagement actions of the plan. A key principle and stage of the CCAP relates to adaptation and responses to same. Noted, this is highlighted in Chapter 4 Baseline as a key issue for biodiversity and human health
	EPA State of the Environment Report 2016 The EPA published our most recent State of the Environment Report in 2016 'Ireland's Environment – An Assessment (EPA, 2016). The recommendations, key issues and challenges described within this report should be considered, as relevant and appropriate to the Plan area in preparing the Draft CCAP and associated SEA. This report can be consulted at: http://www.epa.ie/irelandsenvironment/stateoftheenvironmentreport/	Noted and utilised in this SEA ER. Please see Chapter 3.
	Air quality We welcome that the Plan will take into account the Draft National Clean Air Strategy (DCCAE), due to be finalised in 2019. Recent EPA reports on air quality should also be considered, in preparing the Plan and SEA. This includes the Air Quality in Ireland 2017 Report (EPA, 2018) which sets out the most recent status in each of	Noted this is used in Chapter 4 Baseline Environment

	the four air quality zones in Ireland. Data on levels of atmospheric pollutants from the EPA's national ambient air quality monitoring network (http://www.epa.ie/air/quality/monitor/), should also integrated as appropriate. The pollutants of most concern are traffic-related, including Particulate Matter and Nitrogen Dioxide	
	Noise The Plan should take into consideration available noise action plans prepared within and adjacent to the Plan area. Noise action plans are designed to act as a means of managing environmental noise through land use planning, traffic management and control of noise sources. The third round of noise mapping is currently underway in Ireland and will be completed in 2018. http://noise.eionet.europa.eu/help.html.	Noted and included in Chapter Four.
	Available Guidance & Resources Climate The EPA has published guidelines to support Local Authorities in developing local climate adaptation strategies (EPA, 2016). The DCCAE have incorporated this EPA guidance into national level Guidelines, to also assist local authorities prepare adaptation strategies. (DCCAE, 20185). The 'Climate Ireland' website provides information, support and advice to help local authorities, sectors and government departments to adapt to climate change and includes a Local Authority Adaptation Support Wizard. It can be consulted at http://www.climateireland.ie/#/ Renewable Energy The recently published Interim Guidelines for Planning Authorities on Statutory Plans, Renewable Energy and Climate Change (DHPCLG, 2017) should be taken into account, where relevant. Water Quality Our WFD Application provides a single point of access to water quality and catchment data from the national WFD	Noted

	monitoring programme. The Application is accessed through EDEN https://wfd.edenireland.ie/ and is available to public agencies. Publicly available data can be accessed via the Catchments.ie website	
	SEA Our website contains SEA resources and guidance, including: - SEA process guidance and checklists - list of relevant spatial datasets - topic specific SEA guidance, such as consideration of alternatives in SEA. You can access these resources at: http://www.epa.ie/pubs/advice/ea/ Best practice guidance on Integrated Biodiversity Impact Assessment is also available at: http://www.epa.ie/pubs/reports/research/biodiversity/strivereportno90.html	Noted and used where appropriate in this SEA.
	SEA WebGIS Search and Reporting Tool The EPA SEA WebGIS Search and Reporting Tool is a GIS based web application that allows users to explore, interrogate and produce an indicative report on key aspects of the environment in specific geographic areas. These reports are indicative and will provide an overview of key aspects of the environment within a specific plan area. This may be used to inform the SEA screening and scoping stages for Plans and Programmes with reference in the first instance to the land use sector, though it is also applicable to other sector plans. It may be accessed via www.edenireland.ie	Considered at SEA Screening stage of this CCAP.
	State of the Environment Report – Ireland's Environment 2016 In preparing the Plan and SEA, the recommendations, key issues and challenges described within our State of the Environment Report Ireland's Environment – An Assessment 2016 (EPA, 2016) should be considered, as relevant and appropriate to the Plan. Opportunities for selecting 'win-win' solutions when developing climate-related measures, to address multiple environmental challenges (air, water etc.) should be prioritised.	Noted, please see Chapter 3 for review of this and how the SEA and CCAP relates to the State of the Environment Report. Noted, and agreed, where possible the preparation of the CCAP and SEA have sought to prioritize "win-win" actions.

2.3 Baseline Data

The baseline data assists in describing the current state of the environment, facilitating the identification, evaluation and subsequent monitoring of the effects of the plan. It helps identify Issues and Threats problems in and around the plan area and in turn these can be quantified (for certain environmental parameters) or qualified. This highlights the environmental issues relevant to each SEA parameter and ensures that the plan implementation does not exacerbate such problems. Conversely this information can also be used to promote good environmental practices and opportunities for environmental enhancement, thereby improving environmental quality where possible.

Baseline data was gathered for all parameters. Other data was gathered from the SEA ER of the Dublin City Council Development Plan 2016-2022, Irish Water, the EPA, Met Eireann and other sources as appropriate. Project level environmental assessments where available in relation to transport proposals and/or flood risk management proposals were also reviewed. Footnotes throughout the document, particularly in Chapter Four present the reference and source.
The SEA has also used a Geographical Information System (GIS) in the following ways:

- To provide baseline information on a range of environmental parameters;
- To assist in assessment of alternatives;
- To help assess in-combination or cumulative impacts, and
- To provide maps to illustrate environmental parameters in the SEA Environmental Report.

2.4 Approach to assessment of significant environmental impacts

The principal component of the SEA involves a broad environmental assessment of the objectives/actions of the CCAP. A methodology that uses the concept of expert judgement, public consultation, GIS and matrices, both to assess the environmental impact and to present the conclusions has been adopted in this SEA.

Key to assessing the above is setting a specific set of environmental objectives for each of the environmental topics. The objectives are provided in Chapter Five and include all aspects of the environment such as Cultural Heritage, Population and Human health, and Biodiversity, Flora and Fauna.

The assessment described within this Environmental Report aims to highlight the potential conflicts, if they are present, between the aims and proposals contained in this Dublin City CCAP with the Strategic Environmental Objectives. Furthermore the assessment examines the potential impact arising from the plan's implementation on sensitive environmental receptors.

The SEA Directive requires that information be focused upon ***relevant aspects*** of the environmental characteristics of the area likely to be ***significantly affected*** by the plan and the likely change, ***both positive and negative***, where applicable.
Chapter Seven provides a discussion, where relevant, on the significance and type of the identified impact in accordance with current guidelines.

The SEA legislation and guidelines highlight the importance of the integration between the preparation of

the CCAP and the SEA and AA processes. The iterative nature of the SEA process is such that the CCAP is informed by environmental considerations throughout the preparation of the CCAP and development of actions as relevant. The Screening Statement in support of Appropriate Assessment Report and Natura Impact Report are separate documents to the Environmental Report both of which accompany this Dublin City CCAP 2019-2024.

2.5 Mitigation

Section (g) of Schedule 2B of the SEA Regulations requires information on the mitigation measures that will be put in place to minimise/eliminate any significant adverse impacts due to the implementation of the CCAP. Chapter Eight of this SEA ER highlights the mitigation measures that will be put in place to counter identified significant adverse impacts due to the CCAPs implementation.

The CCAP has been prepared having regard to the environmental protection objectives contained within the Dublin City Development Plan 2016-2022. However, some unavoidable residual issues may remain and therefore mitigation measures are required. Chapter Eight details the mitigation measures necessary to prevent reduce and, as fully as possible, offset any significant adverse impacts on the environment of implementing the CCAP.

2.6 Monitoring

Article 10 of the SEA Directive sets out the requirement that monitoring is to be carried out of the significant environmental effects of the implementation of the CCAP in order to identify at an early stage any unforeseen adverse effects and to be able to undertake appropriate remedial action. Chapter Nine presents the monitoring requirements for the plan, aligned where possible with those of the SEA of the Dublin City Development Plan 2016-2022.

2.7 Strategic Flood Risk Assessment

The Planning System and Flood Risk Management Guidelines (DoEHLG 2009) provide a methodology to incorporate flood risk identification and management into land use strategies. It also requires the alignment and integration of flood risk into the SEA process. The core objectives of the Guidelines are to:

- Avoid inappropriate development in areas at risk of flooding;
- Avoid new developments increasing flood risk elsewhere, including that which may arise from surface water run-off;
- Ensure effective management of residual risks for development permitted in floodplains;
- Avoid unnecessary restriction of national, regional or local economic and social growth;
- Improve the understanding of flood risk among relevant stakeholders; and
- Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

The Strategic Flood Risk Assessment of the Dublin City CDP 2016-2022 has been used in this SEA ER as well as an assessment of any flood related actions and proposals. These findings have been integrated into the CCAP and this SEA ER (See Chapters Four and Seven in particular).

2.8 Data Gaps

Data gaps are present in terms of human health and population at county level.

3 RELATIONSHIP TO RELEVANT PLANS AND PROGRAMMES

3.1 INTRODUCTION

Under the SEA Directive, the relationship between the CCAP and other relevant plans and programmes must be taken into account. A review of the relevant plans and programmes has been prepared as part of the SEA ER. The preparation of the CCAP must be considered within the context of a hierarchy of policies, plans and strategies which include international, national, regional and local level policy documents. These documents set the policy framework within which the proposed CCAP will operate.

The Dublin City Development Plan 2016-2022 (CDP) operates as the primary land use framework for the county and as such, key policies/objectives and environmental protective objectives and policies of the CDP will be applied during CCAP implementation stage.

A list of the key relevant international, national, regional and county policies included in the review are listed below in Sections 3.2 to 3.4. Please see Annex B for a summary of these plans and programmes and their relevance to the CCAP and SEA.

Section 3.5 of this Chapter provides a focused consistency check between Actions in the National Mitigation Plan and key policies of the Eastern Regional and Economic Spatial Strategies that are considered to be particularly relevant to this CCAP[1].

Finally, Section 3.6 identifies key principles that will inform the SEA process arising from this review.

The plans and programmes of particular relevance to this CCAP are highlighted in the review of plans and programmes which can be found in Annex B of this SEA ER[2].

3.2 INTERNATIONAL

- UN Convention of Biological Diversity, 1992
- The Convention on Wetlands of International Importance (The Ramsar Convention) 1971 and subsequent amendments
- EU Environmental Action Programme to 2020
- SEA Directive - Assessment of the effects of certain plans and programmes on the Environment, (2001/42/EC) 2001
- Environmental Impact Assessment Directive (85/337/EEC) (97/11/EC), 1985 and Environmental Impact Assessment Directive (2014/52/EC)
- EU Biodiversity Strategy to 2020
- EU Directive on the Conservation of Wild Birds, (2009/147/EC) 1979. Known as the Birds Directive
- EU Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna, (92/43/EEC), 1992 known as the Habitats Directive
- European Communities (Birds and Natural Habitats) Regulations 2011
- EU Green Infrastructure Strategy 2013
- The Stockholm Convention 2001

[1] This table was prepared on foot of the EPA Scoping submission which recommended aligning actions in the CCAP with those of the National Mitigation Plan. This opportunity was also used to check consistency with relevant policies/objectives of the Draft Eastern Regional Economic and Spatial Strategy

[2] Annex B was amended to reflect a recommendation by the EPA at Scoping Stage to provide a means to highlight relevance of plans to the CCAP.

- EU Soil Thematic Strategy
- Water Framework Directive (2000/60/EC) as amended
- Floods Directive (2007/60/EC)
- The Drinking Water Directive (DWD), (98/83/EC) 1998
- Groundwater Directive, (2006/118/EC) 2006
- EC Bathing Water Quality Directive, (2006/7/EC) 2006
- Paris (Climate Change) Agreement
- Kyoto Protocol
- The Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive
- EU Directive on Waste, (2006/12/EC), 2006
- EU Directive on Waste (2008/98/EC), 2008
- EU Urban Waste Water Treatment Directive (91/271/EEC), 1991
- Directive 2009/28/EC on the promotion of the use of energy from renewable sources
- European Convention on the Protection of the Archaeological Heritage,
- 1992 (The Valletta Convention)
- Convention for the Protection of the Architectural Heritage of Europe, 1985 (Granada Convention)
- The European Landscape Convention 2000
- The Aarhus Convention
- Environmental Liability Directive 2004/35/EC

3.2.2 NATIONAL

- National Planning Framework 2018
- National Adaptation Framework 2018
- Water Framework Directive River Basin Management Plans 2018
- National Mitigation Plan
- Sectoral Climate Adaptation Plans 2018
- Local Authority Adaptation Strategy Development Guidelines, EPA 2016
- Our Sustainable Future A framework for sustainable development in Ireland (2012)
- The National Spatial Strategy 2002 -2020
- National Landscape Strategy (2015-2025)
- 3rd National Biodiversity Action Plan, 2017-2024
- The Wildlife Acts 1976 to 2012
- National Heritage Plan (2002)- to be replaced by Heritage Ireland 2030 (issues paper out now)
- All-Ireland Pollinator Plan 2015-2020
- European Union (Invasive Alien Species) (Freshwater Crayfish) Regulations 2018
- Irish Water's Capital Investment Programme
- Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (Cities, Towns & Villages) (2009)
- Geological Heritage Sites Designation (under the Wildlife Amendment Act 2000)
- Water Services Act (2007)
- Water Services (Amendment) Act (2012)
- Irish Water Services Strategic Plan SEA and AA (2015)
- Irish Water Capital Investment Programme (2017-2024) including forthcoming planning application for Ringsend WWTP upgrade.
- Waterways Ireland Heritage Plan 2014-2020
- The Planning System and Flood Risk Management Guidelines (and Technical Appendices) for Planning Authorities (DoEHLG, OPW), 2009
- National Climate Change Strategy (2007-2012)
- Review of Ireland's climate change policy and Climate Action and Low Carbon Bill 2013
- Smarter Travel, A Sustainable Transport Future, A New Transport Policy for Ireland 2009-2020
- Spatial Planning and National Roads Guidelines
- National Transport Strategy for Greater Dublin Area 2016-2023[3]
- Design Manual for Urban Roads and Streets (DMURS)
- Electric Vehicle Grant Scheme and VRT Relief
- National Monuments Act 1930 with subsequent amendments
- Architectural Heritage Protection - Guidelines for Planning Authorities (2011)
- National Inventory of Architectural Heritage (NIAH)
- Draft Landscape and Landscape Assessment Guidelines, (2000)
- Planning and Development Act 2000 (as amended).
- Planning Policy Statement, 2015
- Green Low Carbon Agriculture Environment Scheme (GLAS)
- National Cycle Policy Framework 2009-2020

- National Transport Authority's Permeability Best Practice Guide
- Public Transport Act 2016

3.2.3 Regional and County

- A Strategy towards a Climate Change Action Plan for Dublin 2017
- Eastern and Midland Assembly (Draft) Regional Spatial and Economic Strategy (2018)
- Eastern-Midlands Regional Waste Management Plan 2015
- Greater Dublin Area Transport Strategy 2016-2035
- Dublin City Council Development Plan 2016-2022
- Dublinl Local Economic and Community Plan 2016
- Dublin City Biodiversity Action Plan 2015-2020 (under review).
- Catchment-Based Flood Risk Management Plans (CFRMP)
- Eastern Catchment Flood Risk Assessment and Management (CFRAM) Study 2011-2016
- Greater Dublin Strategic Drainage Study
- Dublin City Council's Tree Strategy 2016-2021

3.4 Summary of Key Actions from the National Mitigation Plan and policies from the Draft Regional Economic and Spatial Strategies that are relevant to this CCAP.

TABLE 3 CONSISTENCY WITH ACTIONS IN THE NATIONAL MITIGATION PLAN RELEVANT TO THIS CCAP.

	National Mitigation Plan 2017	Climate Change Action Plan 2019-2023
Action 9	Develop proposals to establish regional climate action offices to coordinate Local Authority response to climate action.	Established and has co-ordinated CCAP for each of the Dublin Local authorities
Action 10	Ensure climate considerations are fully addressed in new National Planning Framework.	Indirectly through the Regional Spatial and Economic Strategy once adopted and requirement for Variations to CDP to incorporate the RSES.
Action 31	Warmth & Wellbeing Scheme – 1,500 homes will be upgraded for occupants who qualify for the scheme	Recommended as a Mitigation Measure in this SEA ER as follows: Promote and highlight the Warmth and Wellbeing Scheme in conjunction with HSE
Action 51	Investment in infrastructure and behavioural change interventions to encourage and support a shift to sustainable modes of transport.	Actions in the Transport section identify a comprehensive range of actions to encourage and support modal shifts
Action 89	Continue to support climate and land based research at national and international levels	The role of the Dublin Metropolitan CARO (which will oversee implementation of the CCAP) is to: • Assist the local authorities within the region in preparing their own Climate Change Action Plan • Develop education and awareness initiatives for the public, schools, NGOs and other agencies engaged in driving the climate change agenda and contributing to the National Dialogue on Climate Action on a local and regional basis • Link with third-level institutions in developing a centre of excellence for specific risks – in the case of the Metropolitan Region this will be for urban climate effects • Liaise and interact with the Dublin energy agency Codema

TABLE 4 RELEVANT POLICY OBJECTIVES FROM THE DRAFT REGIONAL SPATIAL AND ECONOMIC STRATEGY EASTERN AND MIDLANDS REGION

Please note the Regional Spatial and Economic Strategy is currently in draft form so the Regional Policies Objectives listed below may be subject to change prior to adoption.

Relevant Policy Objectives from the Draft Regional Spatial and Economic Strategy Eastern and Midlands Region		
Low Carbon Economy RPO 6.20	Support enterprise development agencies and LEOs on the development of industries that create and employ green technologies and take measures to accelerate the transition towards a low carbon economy and circular economy.	Yes, actions (three in total) relating to Transport, Energy and Flood resilience references the Small Business Innovation Research (SBIR)
RPO 7.15:	Local Authorities shall take opportunities to enhance biodiversity and amenities and to ensure the protection of environmentally sensitive sites and habitats, including where flood risk management measures are planned.	Actions under Flood Resilience are consistent with this RPO These include identification of sites for integrated constructed wetlands and SUDs
RPO 7.17	Facilitate cross boundary co-ordination between Local Authorities and the relevant agencies in the Region to provide clear governance arrangements and coordination mechanisms to support the development of ecological networks and enhanced connectivity between protected sites whilst also addressing the need for management of alien invasive species and the conservation of native species.	Actions including Action 5 in Nature Based Solutions are consistent with this as follows: 5 Produce regional floodplain management guidelines - use Santry River as a demonstration
REGIONAL POLICY OBJECTIVES: Green Infrastructure RPO 7.21	Local authority Development Plan and Local Area Plans, shall identify, protect, enhance, provide and manage Green Infrastructure in an integrated and coherent manner and should also have regard to the required targets in relation to the conservation of European sites, other nature conservation sites, ecological networks, and protected species.	DCC County Development Plan 2016-2022 includes a large number of GI policy and objectives such as Dublin City Development Plan 2016-2022 (Policies CC4; GI1; GI10; GI12; GI14; GI19; GI29; GI30; SCO1; SI18, SN3; Section 16.2.1.2; Appendix 23) Actions in the Nature Based Solutions theme include a number of GI actions such as Action 80, for example:

Relevant Policy Objectives from the Draft Regional Spatial and Economic Strategy Eastern and Midlands Region		
		8:Develop Green Infrastructure Strategy for region
RPO 7.22	Support the further development of Green Infrastructure policies and coordinate the mapping of strategic Green Infrastructure in the Region.	See comment above
Greenways, Blueways and Peatways RPO 7.23:	Promote the development of a sustainable Strategic Greenway Network of national and regional routes, with a number of high capacity flagship routes that can be extended and /or linked with local Greenways and other cycling and walking infrastructure.	See Actions in Active Travel under Transport Theme
Climate Change RPO 7.28	Within 1 year of the adoption of the RSES, the EMRA shall seek with other stakeholders to carry out an assessment of transport emissions in the Region to identify GHG forecasting and to analyse the emissions impacts of development in the Region.	This can be supported through the baseline study of Greenhouse Gas Emissions for the local authority undertaken for 2016 by Codema with support from SEAI.
RPO 7.31:	Local Authorities shall develop, adopt and implement local climate action strategies which shall assess local vulnerability to climate risks, quantify the emissions produced within their jurisdictions, and identify, cost and prioritise adaptation actions in accordance with the guiding principles of the National Adaptation Framework	The CCAP is the draft action plan that will meet this objective.
RPO 7.32:	Climate Action Regional Offices shall provide guidelines and support to the Local Authorities on the development, adoption and implementation of local climate action strategies (both mitigation and adaption). These guidelines shall include the specific actions and obligations and timescales for same that must be undertaken by the Local Authorities to comply with national policy.	As above, this Draft Climate Change Action Plan has been prepared by the Dublin energy agency Codema, in partnership with the Environment, Public Realm and Climate Change Policy Committee and the Elected Members of Dublin City Council. The Draft Action Plan was also prepared having regard to A Strategy towards Climate Change Action Plans for the Dublin Local Authorities, published in 2017.
RPO 7.33:	EMRA supports the National Policy Statement on Bioeconomy (2018) and supports the exploration of opportunities in the circular resource-efficient	Action 19 in Energy: Expand and develop Small Business Innovation & Research (SBIR) programme

Relevant Policy Objectives from the Draft Regional Spatial and Economic Strategy Eastern and Midlands Region		
	economy including undertaking a bio-economy feasibility study for the Region to identify the area of potential growth in the Region to inform investment in line with the national transition objective to a low carbon climate resilient economy.	
Building Standards RPO 7.38:	Local Authorities shall report annually on energy usage in all public buildings and will achieve a target of 33% improvement in energy efficiency in all buildings in line with the requirements of the National Energy Efficiency Action Plan (NEEAP).	Stated target of the CCAP is a 33% improvement in council's energy efficiency by 2020. Baseline section of the CCAP provides a breakdown of this.
RPO 7.39:	Local Authorities shall include policies in statutory land use plans to promote high levels of energy conservation, energy efficiency and the use of renewable energy sources in existing buildings, including retro fitting of energy efficiency measures in the existing building stock and energy efficiency in traditional buildings. All new buildings within the Region will be required to achieve the Nearly ZeroEnergy Buildings (NZEB) standard in line with the Energy Performance of Buildings Directive (EPBD).	Actions in the Energy theme including Action 12:
RPO 7.40:	Support and promote structural materials in the construction industry that have low to zero embodied energy & CO2 emissions.	Several actions in the Energy Theme
Decarbonising Transport RPO 7.41	: Local Authorities shall include proposals in statutory land use plans to facilitate and encourage an increase in electric vehicle use, including measure for more recharging facilities and prioritisation of parking for EVs in central locations.	Several Actions in the Transport Theme address this eg: Action 1 and 2 for example.

3.3 KEY PRINCIPLES IDENTIFIED FROM REVIEW.

Following the review of the relationship between the above plans, policies and programmes the following key principles have been identified and this have been considered through the SEA and helped to inform the CCAP development.

Table 5 Principles from plan, policy and programme review.

SEA Topic	Principles/Implications for the CCAP and SEA	EPA State of Irelands Environment 2016 Key Issues	CCAP 2019-2024 Relevant Theme
Biodiversity, Flora and Fauna	• Conserve and enhance biodiversity at all levels • Avoid and minimise effects on nationally and internationally rare and threatened species and habitats through sensitive design and consultation, recognising ecological connectivity where possible • Facilitate species and habitat adaption to climate change • Avoid and minimise habitat fragmentation and seek opportunities to improve habitat connectivity • Ensure careful consideration of non-native invasive and alien species issues	Implementation of legislation Climate change Environment and health and well being Nature and wild places	Nature Based Solutions Citizen Engagement and Awareness Flood Resilience Resource management
Population and Human Health	• Provide for sustainable communities with key services • Energy efficiency in buildings and model transport shift • A high quality environment to live, work	Environment and health and well being Implementation of legislation Climate change Community engagement	Energy Transport Nature Based Solutions Resource Management Citizen engagement

SEA Topic	Principles/Implications for the CCAP and SEA	EPA State of Irelands Environment 2016 Key Issues	CCAP 2019-2024 Relevant Theme
	and play in • Avoid pollution and environmental health impacts (noise and air quality) through mitigation and design • Awareness raising	Sustainable economic activities	
Water	• Maintain and improve water quality • Avoid and minimise effects on natural processes, particularly natural flood management and catchment processes through sensitive design and consultation • Adapt and improve resilience to the effects of climate change • Minimise water consumption/ abstractions • Design SUDS to facilitate ecological improvement/ enhancement where possible	Restore and protect water quality Implementation of legislation Climate change Environment and health and well being	Nature Based Solutions Resource Management Citizen engagement and awareness
Soil and Geology	• Conserve soil resources where possible and avoid waste of soil resources • Maintain productive capacity and prevent erosion of soils • Ensure careful consideration of non-native invasive and alien species issues	Climate change Environment and health and well being Sustainable economic activities	Resource Management Nature Based Solutions Citizen engagement and awareness
Material Assets	• Avoid and minimise waste generation • Maximise re-use of material resources and use of recycled materials • Minimise energy consumption and encourage use of renewable energy	Restore and protect water quality Implementation of legislation Climate change Environment and health and well	Nature Based Solutions Resource Management Citizen engagement and awareness Flood Resilience

SEA Topic	Principles/Implications for the CCAP and SEA	EPA State of Irelands Environment 2016 Key Issues	CCAP 2019-2024 Relevant Theme
	• Promote sustainable transport patterns and modes where possible. • Plan and provide for sustainable water management and wastewater treatment • Modal shifts and sustainable transport • Awareness raising	being Sustainable economic activities	Energy Transport
Air Quality and Climate	• Adapt and improve resilience to the effects of climate change • Encourage reduction in greenhouse gases through transport, energy, built development. • Minimise adverse impacts associated with air and noise quality	Climate change Implementation of legislation Environment and health and well being	Energy Transport Resource Management Nature based solutions Citizen Engagement
Cultural Heritage	• Conserve, preserve and record architectural and archaeological heritage • Avoid and minimise effects on historic environment features through sensitive design and consultation	Environment and health and well being Sustainable economic activities	Nature based solutions Citizen engagement Transport
Landscape	• Integrate green and blue infrastructure considerations • Improve landscape connectivity to surrounding areas	Environment and health and well being Nature and wild places	Nature based solutions Flood resilience Citizen Engagement Resource Management
Climate change and sustainability	• Adapt and improve resilience to the effects of climate change • Promote local/ sustainable sourcing of materials	Environment and health and well being Sustainable economic activities Climate change Implementation of legislation	Nature based solutions Flood resilience Citizen Engagement Resource Management Energy

SEA Topic	Principles/Implications for the CCAP and SEA	EPA State of Irelands Environment 2016 Key Issues	CCAP 2019-2024 Relevant Theme
	Promote sustainable design and innovation to reduce material consumption		Transport
Inter-relationships	• Maintain and improve the health of people, ecosystems and natural processes • Adapt and improve resilience to climate change and extreme weather events • Actively seek to integrate opportunities for environmental enhancement	Environment and health and well being Sustainable economic activities Climate change Implementation of legislation Nature and wild places Restore and protect water quality Community engagement	Nature based solutions Flood resilience Citizen Engagement Resource Management Energy Transport

4 KEY ENVIRONMENTAL RESOURCES

4.1 INTRODUCTION

This chapter describes the environmental baseline for the Dublin City CCAP area. The baseline information presents the environmental context within which the CCAP will operate and the opportunities, constraints and targets placed on the plan in this regard. The environmental data is described in line with the legislative requirements of the SEA Directive and Regulations, as amended under the following environmental parameter headings:

- Population and Human Health
- Biodiversity, Flora and Fauna
- Soil and Geology
- Air and Climate
- Water
- Material assets
- Culture
- Landscape
- The inter-relationship between the above parameters will also be considered in this chapter.

4.1.1 THE PLAN AREA AND SPHERE OF INFLUENCE

The CCAP for Dublin City in the first instance identifies both general actions and more site specific actions. However, given that the four Dublin Local Authorities are preparing these CCAPs in tandem, there is also a regional aspect to the sphere of influence. This is particularly relevant where plan actions relate to features such as rivers and/or landscapes that can and do cross local authority boundaries. Similarly mobile species may disperse over larger areas of the landscape and require consideration at a different scale. The potential for cumulative and in-combination effects (both positive and negative) are also a consideration in this SEA ER.

4.2 POPULATION AND HUMAN HEALTH

This section provides information on the current population and demographic trends in Dublin City and more broadly at Regional Level. Impacts can arise on people's health and quality of life from a range of environmental factors, often through a combination of environmental impacts such as landuse, water quality, air quality, noise and transport patterns. Many of these may be exacerbated from climate change effects and impacts.

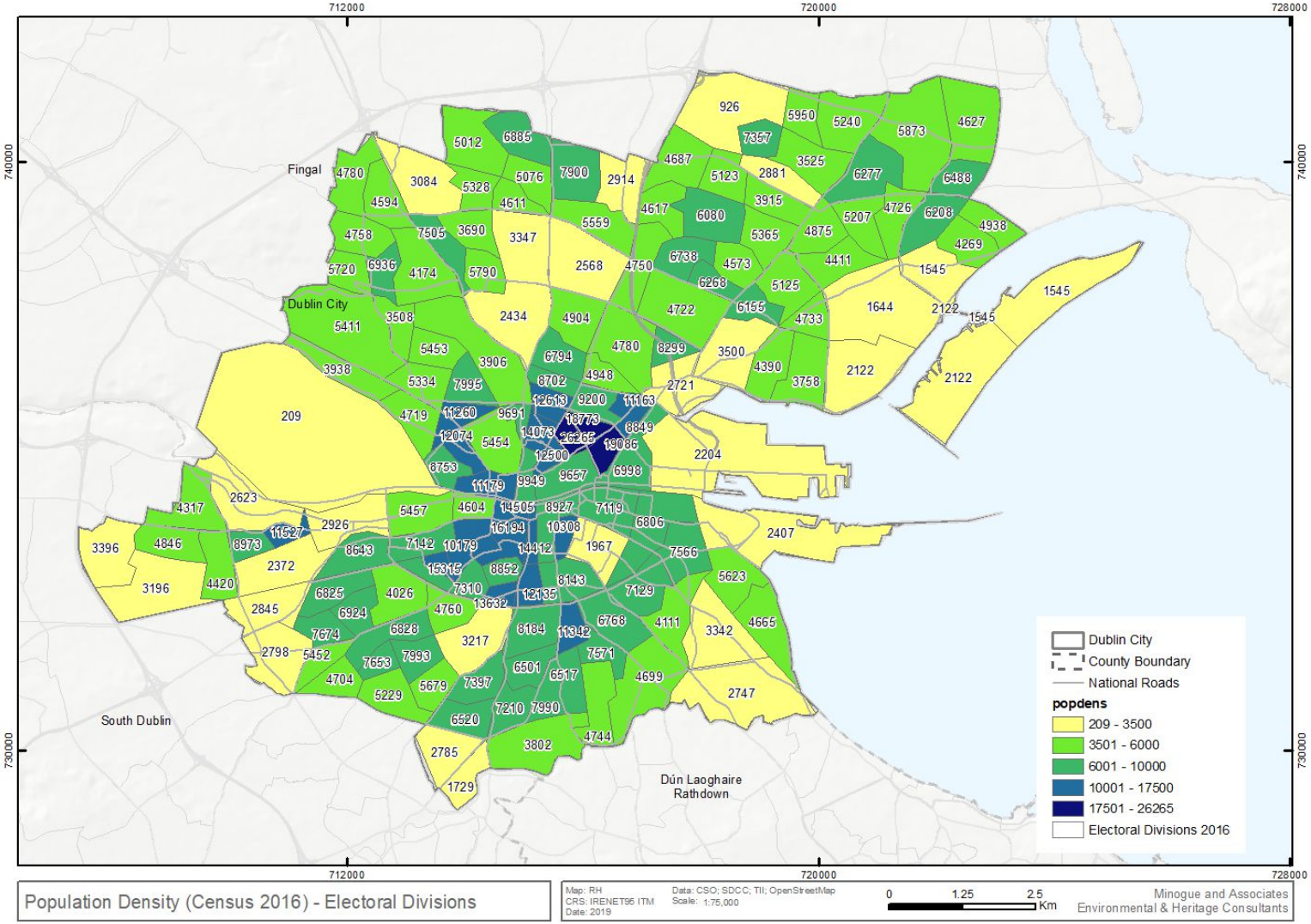
When compared with their surrounding regions, urban areas are considered to be particularly vulnerable to these climatic changes. This is due to: the high concentrations of population, infrastructure and economic activities located in these areas, the exacerbation of climate impacts by urban-scale phenomena and dependency on surrounding regions for service provision[4].

Figure 1 below presents population density for the Dublin City based on the 2016 Census. As the figure shows, population density varies throughout the county, with implications in terms of provision of services, ecological connectivity and maximising sustainable

[4] This paragraph is taken from the Urb Adapt Project Summary running till 2019 will use the Dublin Region as a case study that will allow for the integrated assessment and management of current and future climate vulnerabilities within the context of existing climate and non-climate pressures and spatial planning practices. https://urbadapt.com/

transport and landuse. In terms of broad trends however, the figure below shows greater population densities closer to and in the city centre, with lower population densities to the east and western parts of the City.

Figure 1 Population Density of Dublin City (Census 2016)



4.2.2 HUMAN HEALTH

Human health can be determined by social, environmental and economic factors, among others. Human health may be impacted upon in a variety of ways and by a number of environmental receptors such as water, biodiversity, climate, flooding, air and major accidents, etc. The exposure to contaminants or pollutants can have serious implications for human health. Potential impacts on population and human health include inadequate water and wastewater and waste infrastructure, contamination of soils, excessive noise, flooding and poor air quality in areas where there are large volumes of traffic.

The Institute of Public Health states:

'*Where people live affects their health. There are a number of elements of the living environment that influence health including the built environment, travel choices and the communities in which people live. The design, maintenance and location of buildings influence health. Similarly, public spaces and transport networks can facilitate health by providing opportunities for physical activity, social interaction and access to social goods'*.

Disadvantaged people are more likely to live in poor quality built environments and have limited access to transport and local amenities supporting healthy choices. This has further implications in regard to climate change and CCAP actions such as, retrofitting of houses and potential exposures to air quality emissions. **Figure 2** below identifies key factors that contribute to human health. This is followed by a summary of the key environmental factors that can affect human health.

FIGURE 2 ENVIRONMENTAL DETERMINANTS OF HEALTH[5]

4.2.3 HUMAN HEALTH AND NOISE

Environmental noise is treated in a different way to noise nuisance. A nuisance noise is something that occurs from time to time and is not usually considered to be a feature of life in the local area. For example, a noisy dog or late night parties are short term occurrences. Even if they happen regularly, they are not caused by any long term activities and so they are thought of as nuisance noise.

Environmental noise is from long term or permanent sources, like major transport routes and factories. Noise from these sources has a different effect on people and is managed in a different way. The Environmental Noise Directive was written into Irish law in 2006, through the Environmental Noise Regulations (Statutory Instrument No. 140 of 2006). This law relates to the assessment and management of environmental noise. They provide for a common approach intended

[5] The determinants of health and well-being (Barton & Grant 2006)

to avoid, prevent or reduce the harmful effects, including annoyance, due to exposure to environmental noise. These regulations do not apply to nuisance noise which can be dealt with under the Environmental Protection Agency Act.

Noise Action Plans are required under the Environmental Noise Directive (EU 2002/49/EC) transposed in to Irish law by SI 140 of 2006. Dublin City in conjunction with the other three Dublin local authorities have prepared a plan for 2013-2018 and establishes the measures that the councils intend to take to manage environmental noise exposure. The plan also contains an assessment of possible noise hotspots throughout the area. The Dublin Agglomeration Environmental Noise Action plan 2018-2023 was on public display until December 2018.

In the context of the CCAP, existing roads operate as the greatest noise generators. Thresholds for desirable low and undesirable high sound levels in the Noise Action Plan are as follows:

- Desirable Low Sound levels • < 50 dB(A) Lnight • < 55 dB(A) Lday
- Undesirable High Sound levels • > 55 dB(A) Lnight • > 70 dB(A) Lday

The noise mapping for roads show the M50 as the largest contributor to noise, with the N11 also generating significant noise emissions. Smaller areas of noise hotspots are present around the local authority area.

The Dublin Agglomeration Environmental Noise Action Plan 2013-2018 (and the Draft Dublin Agglomeration Environmental Noise Action Plan 2018-2023) sets out a number of potential mitigation measures to address noise issues that are under the local authorities remit.

4.2.4 Human Health and Air Quality

The Air Framework Directive 96/62/EC (CEC, 1996) details how ambient air quality should be monitored assessed and managed. This Directive requires that member states divide their territory into zones for the assessment and management of air quality. Dublin City as part of the Dublin City agglomeration is designated as a Zone A.

The Air Quality Index of health[6] is based on hourly monitoring data from sites around Ireland and is based is based on measurements of five air pollutants all of which can harm health. The five pollutants are:

- Ozone gas
- Nitrogen dioxide gas
- Sulphur dioxide gas
- PM2.5 particles and
- PM10 particle

Dublin City is located within the 'Dublin City' region. The two key sectors that predominantly impact negatively on air quality are residential heating and transport[7].

The Air Pollution Regulations (2012) were signed into law by the Minister for Environment, Community and Local Government on 31st August 2012. One of the key elements of the regulations has been the designation of new towns as smokeless zones and the expansion of the ban areas in towns that were previously covered under the old regulations. All of the four local authorities in Dublin have a ban on the sale, marketing, distribution and burning of specified fuel i.e. only smokeless fuel allowed

[6] http://www.epa.ie/air/quality/
[7] Air Quality in Ireland 2016 EPA

The EPA State of the Environment Report (2016) has further highlighted the role of environmental quality and health and in turn has highlighted the adoption of the newer more stringent World Health Organization guideline values for air quality. The Clean Air Policy Package (EC 2014) involves a move to tackling air emissions at source with potentially tighter air quality standards from 2020 onwards[8].

4.2.5 Existing issues Population and human health.

The key issues associated with the Eastern and Midland RSES[9] and population/human health were used for this section, complemented by issues identified in the Dublin City CDP 2016-2022, key relevant issues include:

- Addressing historic settlement pat terns leading to sprawl and Unbalanced regional development;
- Increased capacity/ infrastructural requirements for water and wastew ater treatment to service population growth;
- Increased requirements for public transport services and cycle corridors to service population growth and commuter belts;
- Increasing car dependency and associated emissions to air;
- Changes in climate, especially increases in temperature, will impact the concentration of pollutants in the air, as temperatures increase, so too will the concentration of pollutants. This is also the case with the changing strength and frequency of high wind speeds due to climate change, which may cause pollutant dispersion and could potentially affect a larger area and population.

The following broad range of issues has been identified in the SEA ER of the Dublin City CDP 2016-2022, which include localised as well as more strategic issues:

- The effect of transport sector on air quality – results from air quality monitoring indicate that compliance with stringent new PM10, PM2.5 and NO2 standards may present problems in urban areas where there is heavy traffic.
- Impacts on residents from excessive noise uses, e.g., related to commercial activities, and complaints related to construction.
- Requirements of the 'Dublin Regional Air Quality Management Plan' to be taken into account.
- Implementation of the 'Dublin Agglomeration Action Plan relating to the Assessment and Management of Environmental Noise.'
- Need to encourage people to move into the city rather than out to the suburbs in the interests of sustainable development.
- Demand for more housing units and finite stock of zoned and serviced lands.
- The city has a high vacancy rate and should encourage the use of the existing vacant stock.
- The effect of changing economic circumstances on population figures.
- Transboundary impacts with other Dublin Region Local Authorities. These cumulative impacts need to be taken into account.

[8] SEA ER of National Mitigation Plan 2017.

[9] SEA Environmental Report for the draft Eastern and Midland RSES https://emra.ie/draft-rses-public-consultation/

4.3 Biodiversity, Flora and Fauna

In general terms biodiversity[10] refers to:

- Different habitats such as woodlands, wetlands, grasslands and estuarine habitats and the range of flora and fauna species they support.
- Different species such as plants, mammals, birds, insects, fish, microbes, mosses and fungi, and their inter-relationships such as food chains and cohabitation.
- Genetic diversity within species which is vital for healthy populations of individual species to survive. Ecosystems diversity which are the relationships between different species, their habitats and their local, non-living environment (geology, hydrology and microclimate).
- Features of the landscapes, which by virtue of their linear and continuous structure (such as hedgerows or streams) or their function as links (such as ponds or small woods) are essential for the migration, dispersal and genetic exchange of wild species.
- Flora and Fauna are the plant and animal life, respectively.

A wide range of economic and social benefits and services result from the protection of biodiversity, for example, it forms the basis of our landscapes, provides for food and clean water supplies, opportunities for waste disposal, nutrient recycling, flood storage and regulation, amenity and recreational opportunities through development of green infrastructure network. It is increasingly recognised the nature based solutions can offer a further means to adapt and respond to climate change.

[10] Text from draft SEA ER of Clare CDP 2017-2023

4.3.1 Overview

Dublin city is a largely urban environment and is partially built on reclaimed or in-filled lands. The city and its bay, as a natural harbour at the confluence of several river basins, contain a variety of ecosystems that are biologically diverse and of international and national importance for the species which inhabit them and their associations. The ecological value of these areas is a resource for Dublin's citizens and also remarkable for such an urbanised capital city.

The City Council has an objective to promote connectivity of habitats and the enhancement of green corridors of public open space both for biodiversity and amenity values. The system of freshwater streams, rivers, estuarine habitats and beaches that is managed by Dublin City Council provides a network of connected natural areas, part of the green infrastructure of Dublin city. To protect and enhance this natural asset, several management plans have been prepared for all aspects, including biodiversity and flora and fauna, for the Dodder, Tolka, Liffey and North Bull Island. Habitat management plans have also been prepared for a number of city parks, including Bushy Park and Le Fanu Park.

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

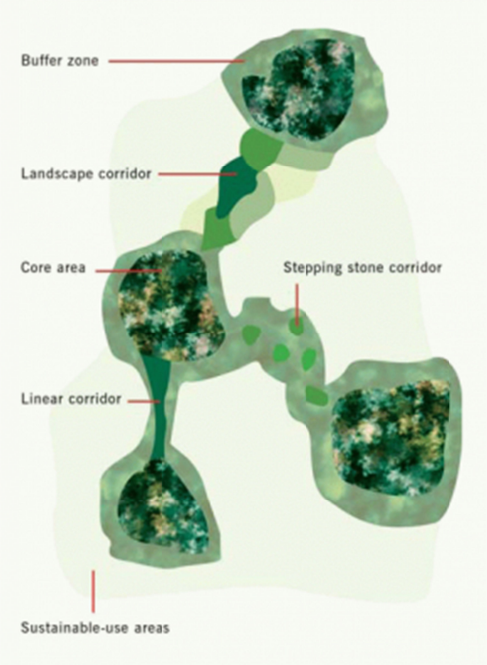
importance as they form part of a network of green spaces across the Plan area including gardens, parks, graveyards, amenity walks, railway lines and patches of woodland and scrub within which animals and plants continue to thrive.

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.

The council has an objective in the existing Plan to promote connectivity of habitats and the enhancement of green corridors of public open space both for biodiversity and amenity values. The system of freshwater streams, rivers, estuarine habitats and beaches that we manage provides a network of connected natural areas, the green infrastructure of Dublin city.

Green infrastructure strategies are recognised as an essential component in European, national and regional policies. The city's green infrastructure network includes historic parks, gardens and Georgian squares of national and international importance. Green infrastructure is recognised as comprising an essential component contributing to quality of life and well-being for residents, in addition to conserving habitat connectivity and reducing habitat fragmentation. To protect and enhance this natural asset, Dublin City Council has prepared several management plans for all aspects, including biodiversity and flora and fauna. These plans include the Dodder, Tolka, Liffey and North Bull Island.

FIGURE 3 OVERVIEW OF LANDSCAPE MOSAIC WITH STEPPING STONES AND ECOLOGICAL CORRIDORS[11]



4.3.2 Designated Sites

Within the County there are habitats of high biodiversity and conservation value and a number of designated sites associated within the county which are designated as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Natural Heritage Areas (NHAs).

Whilst Natural Heritage Areas (NHAs) and other designated sites do not form part of the Natura 2000 network they contribute to the network in a supporting role, often by providing stepping stones and ecological connectivity for mobile species in particular. Under the Wildlife Amendment Act (2000), Natural Heritage Areas are legally protected from damage from the date they are formally proposed for designation.

[11] source: http://www.sicirec.org/definitions/corridors)

Special Areas of conservation and Special Protection Areas

North Dublin Bay is a candidate SAC, and includes North Bull Island. The site straddles both Dublin City and Fingal County Council administrative areas and covers the inner part of North Dublin Bay, the seaward boundary extending from the North Bull Wall Lighthouse to the Martello Tower at Howth Head.

South Dublin Bay is also candidate SAC. This site includes Booterstown Marsh, along the city boundary and straddles both Dublin City and Dún Laoghaire-Rathdown County Council administrative areas. The site lies south of the River Liffey and extends from the South Wall to the West Pier at Dún Laoghaire. The new habitats at Merrion Gates and just south is becoming increasingly important for roosting waterfowl and includes embryonic dunes and a sand spit. The largest stand of eelgrass on the east coast occurs within this designated area at Merrion Gates.

An offshore SAC– Rockabill to Dalkey Island SAC is outside the Dublin city boundary, approximately 2.4 km off the Dublin coastline and is designated for reefs and the harbour porpoise.

In addition, there exists the potential for a site located approximately 30 km east of Dublin city to become designated in the future as an SAC for the protection of 'leaking gas structures' (an Annex I habitat). This site is currently called the Codling Fault Zone SAC (site code: 003015.

SPAs are sites which are legally protected for birds under the EU Birds Directive. There are two in Dublin City: South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA.

Natural Heritage Areas (NHA)

Dublin City Council manages several proposed Natural Heritage Areas (pNHA) which are: North Dublin Bay, South Dublin Bay, Mooring 'Dolphins', Dublin Docks near Pigeon House Harbour, the Royal Canal and the Grand Canal. These are designated under the Wildlife Act as of national importance for the habitats and/or species present.

RAMSAR Sites

North Bull Island and Sandymount Strand are listed sites in Dublin city under the RAMSAR Convention of 1971 (signed by Ireland in 1985) as wetlands of international importance, particularly for wildfowl habitats. It is a voluntary treaty of which Ireland is a signatory. The RAMSAR committee for Ireland is currently compiling a national database on wetlands however there is currently no database for Dublin city.

Special Amenity Area Orders (SAAO)

North Bull Island is a National Special Amenity Area, representing a landscape of national importance for its aesthetic and recreational value; Bull Island is one of three such designations in Ireland and was designated under Special Amenity Area Order in 1994. There is a proposed SAAO under consideration for the river Liffey valley. While these sites are designated by Ministerial Order on the basis of their outstanding amenity values, it is the natural heritage of both locations which provides the resource for recreation and amenity. Protection of biodiversity, flora and fauna is therefore a contributing factor to amenity potential.

National Nature Reserves

North Bull Island and Baldoyle Estuary are both designated national nature reserves under the terms of the Wildlife Act.

Flora Protection Order Sites

The making of a Flora Protection Order under the Wildlife Act provides protection for nationally important sites for protected plants. North Bull Island is listed for lesser centaury, hemp nettle and meadow saxifrage. The Royal Canal is listed for opposite-leaved Pondweed.

4.3.3 Dublin Bay Biosphere

North Bull Island was recognised on the UNESCO World Network of Biosphere Reserves in 1981. North Bull Island is unique among biosphere reserves given its close proximity to a capital city. There are two golf clubs on the island, the Royal Dublin Golf Club and St Anne's Golf Club; these are not part of the biosphere reserve extents itself but are integral to the site and have important links to the reserve.

The Dublin Bay Biosphere Biodiversity Conservation and Research Strategy 2016-2020 was published in 2017 and aims, firstly, to provide a coordinated framework for biodiversity conservation and research activities to be undertaken by DBBP and, secondly, to provide clarity regarding these planned activities to all stakeholders within DBB.

4.3.4 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).

4.3.5 Aquatic Biodiversity

A review of fish stocks carried out for the river Tolka by Inland Fisheries Ireland in 2011 indicated the presence of juvenile Atlantic salmon, represent the first record of wild salmon reproducing in this river in a century. A Fishery Enhancement Plan for Phase 1 of Cardiffsbridge Park, Finglas (2006) was prepared as part of the Master Plan for Cardiffsbridge Park. Dublin City Council has also collaborated with Inland Fisheries Ireland, Queen's University Belfast and local angling clubs in a genetic study of trout populations in all of the city's major rivers to determine spawning areas and population sources for future management of fisheries stocks.

Under Article 5 of the Shellfish Water Directive (2006/113/EC) Malahide Shellfish Area, located approximately 3.2 km to the north-east of Dublin City's boundary, has been designated as shellfish growing waters. A pollution-reduction programme was established by the minister for the Environment, Community and Local Government to protect these waters and improve water quality.

4.3.7 Alien and Invasive Species

The control of invasive species in Ireland comes under the Wildlife (Amendment) Act 2000. Under the European legislation, the Birds and Natural Habitats Regulations 2011 (SI 477 of 2011) , Section 49(2) prohibit the introduction and dispersal of species listed in the Third Schedule (including Japanese Knotweed) whereby "any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow [….] shall be guilty of an offence."

Note some of the alien and invasive species are considered greater risk than others, and the potential for water corridors such as the Dodder to be vectors of the dispersal of these species is important; as well as accidental transfer or introduction arising from construction activities or recreational activities.

4.3.6 Existing Issues: Biodiversity, Flora and Fauna

Projected increases in temperature, wind speeds, cold snaps and rainfall will put an increased stress on biodiversity, by causing damage, habitat loss and increasing the prevalence of invasive species.

Flood plains and wetland areas are essential for flood control, pollution control, water quality and supply as well as act as vital carbon sinks, along with peatlands and woodlands, which could help address climate change.

Changes in precipitation levels, air and soil temperatures, water availability and sea level rise all have implications in terms of effects on biodiversity. The effects will be cumulative, long-term and often complex. The uncertainty that surrounds climate change and what will occur also adds to the complexity and uncertainty of identifying impacts.

Other key issues relate to the following:

- The potential for climate change to increase spread of non-native species, habitat change and increases spread of pathogens
- Using nature based solutions to adapt to climate change
- Ensuring increased walking and cycling proposals minimise adverse effects to flora and fauna.

The SEA ER of the Dublin City Development Plan 2016-2022 highlighted other environmental issues as they relate to biodiversity:

- Potential increased flood risk from changed land-use patterns, climate change and predicted sea rise level could result in loss or alteration of habitats through erosion and alteration of levels.
- City Council area is traversed by a number of key regional river systems; future development within the city area should not have a deleterious effect on the aquatic life in these systems.
- The existing wastewater treatment plant at Ringsend is operating over its design capacity and has no additional capacity to facilitate the anticipated increase in population in the city. This will potentially lead to deterioration in water quality and associated ecological impacts if no mitigation measures are put in place.
- Increased volumes of surface water run-off due to conversion of permeable landscapes to impermeable. This can lead to increased flooding, erosion and alteration and direct loss of habitat.

The SEA ER of the Eastern and Midland RSES identifies further potential issues relating to this CCAP:

- Loss or disturbance of habitats and species from land use change and changes to land management; and
- in combination/cumulative effects without landuse plans and programmes such as forestry, fisheries etc.

Figure 4 Special Area of Conservation sites within 15km of the County

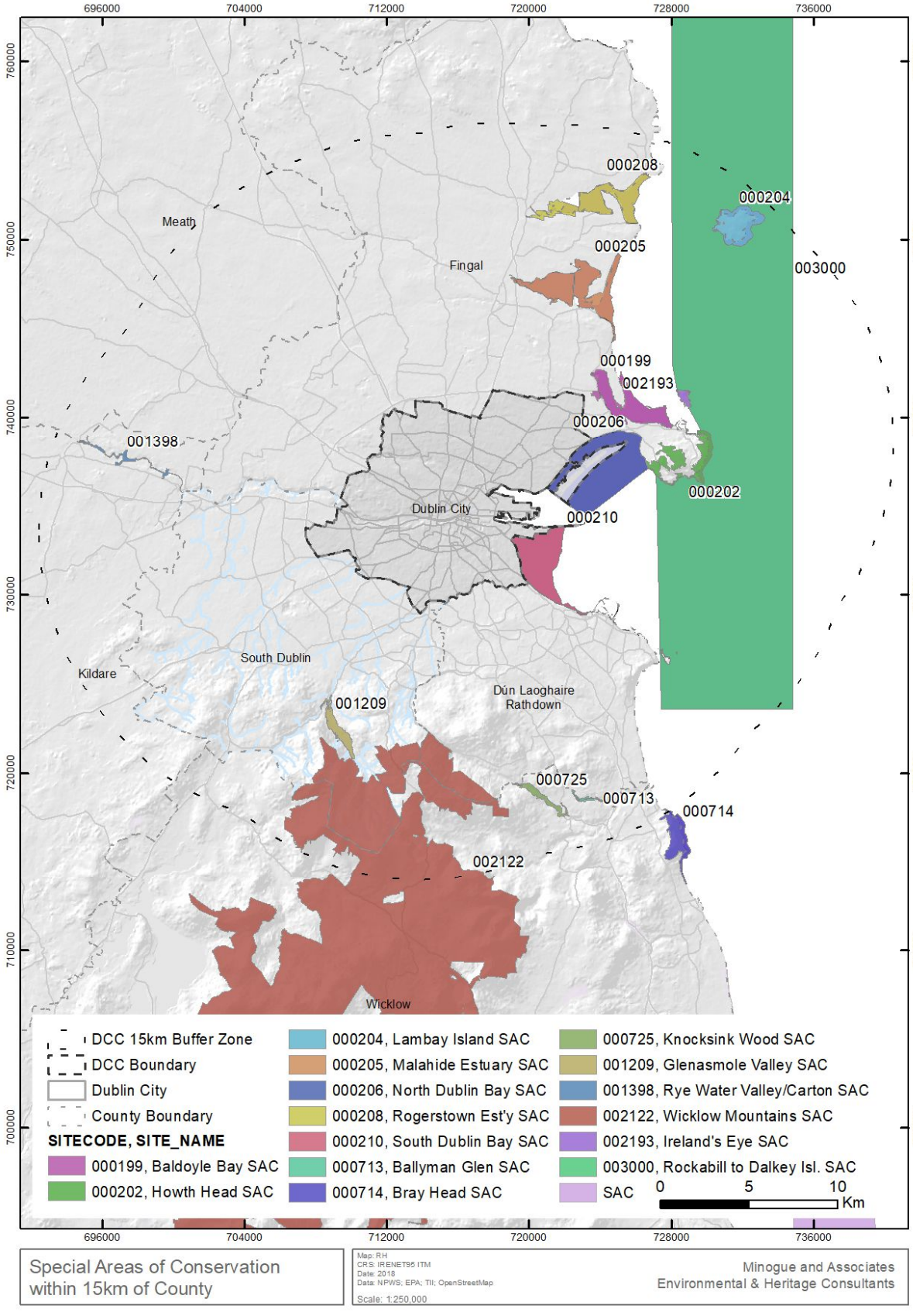


Figure 5 Special Protection Area sites within 15km of the County

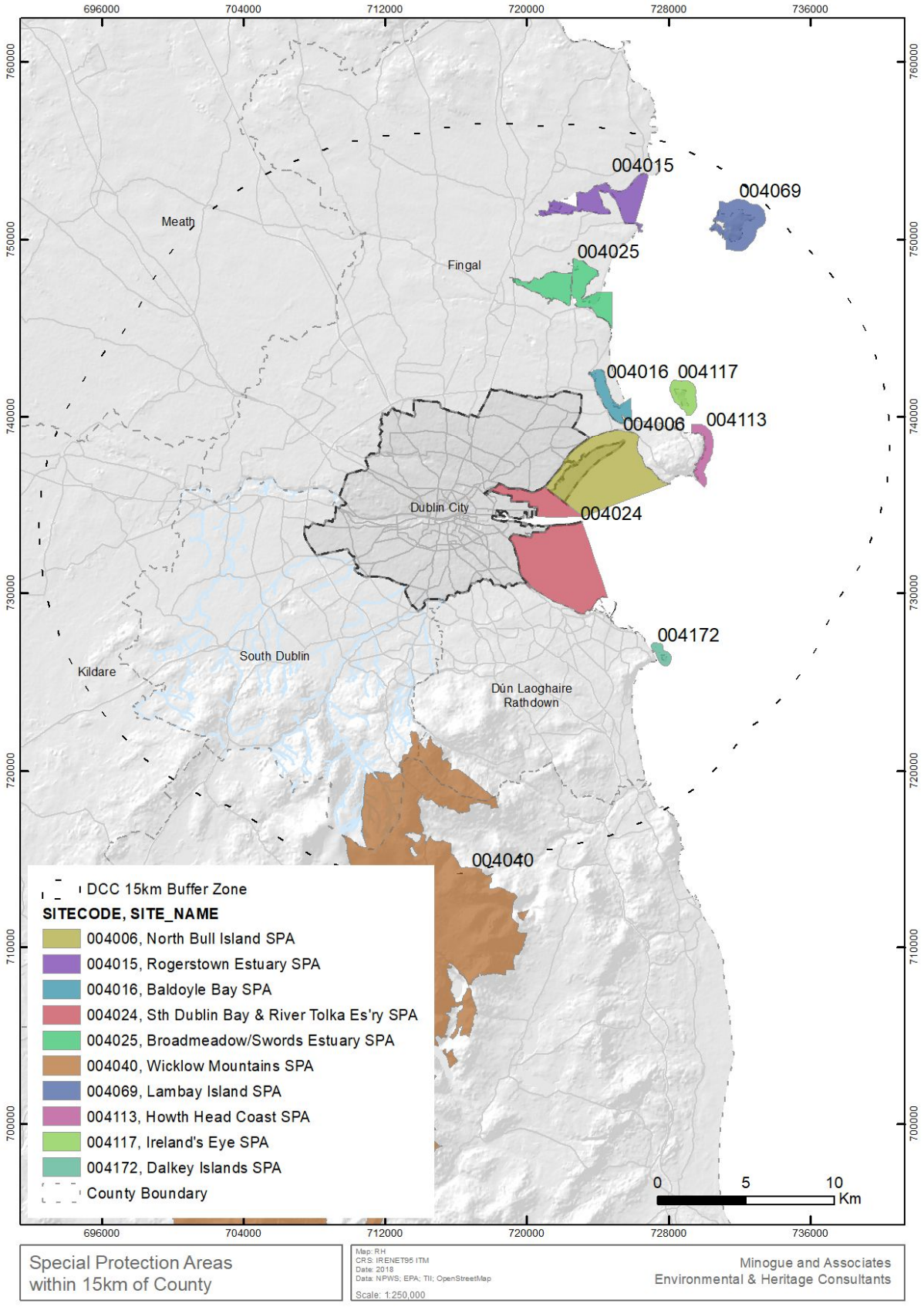
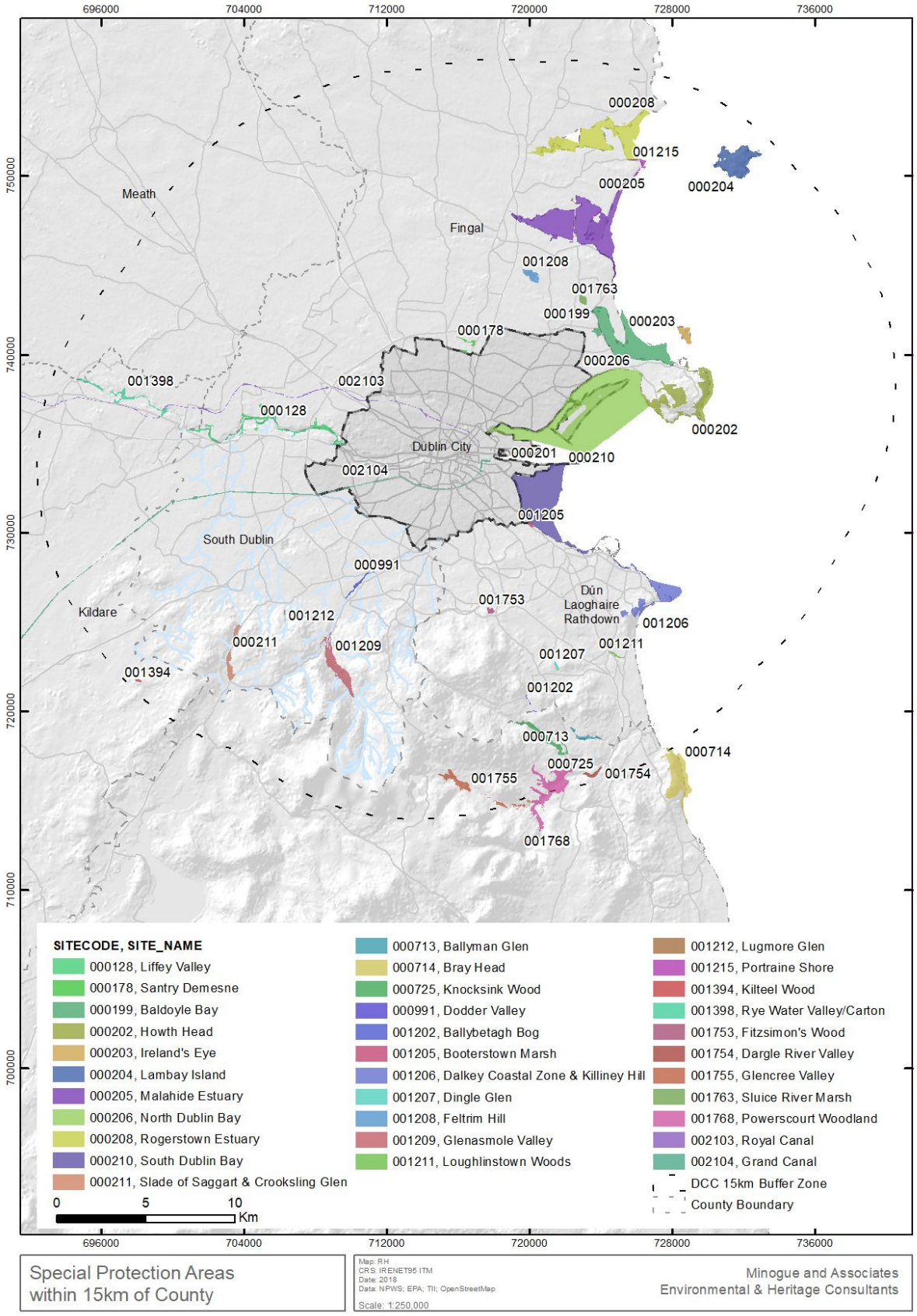


FIGURE 6 PROPOSED NATURAL HERITAGE AREAS



4.4 Water Resources[12] including Flood Risk

Water resources and their quality have a clear interaction and impacts with other environmental parameters, therefore its protection and enhancement is of particular importance.

4.4.1 Water Framework Directive

The Water Framework Directive (WFD) is a key initiative aimed at improving water quality throughout the EU. It applies to rivers, lakes, groundwater, estuarine and coastal waters. The Directive requires an integrated approach to managing water quality on a river basin basis; with the aim of maintaining and improving water quality. The WFD identifies River Basin Districts as the key management units with clearly defined water bodies forming the basis for assessment reporting and management. The first cycle of RBD management plans were from 2009 to 2015. For the second cycle the Eastern, South Eastern, South Western, Western and Shannon River Basin Districts have been merged to form one national River Basin District.

The most recent data for the new plans being prepared is from the catchments.ie website. A catchment is an area where water is collected by the natural landscape and flows from source through river, lakes and groundwater to the sea. Dublin City is situated within the Liffey and Dublin Bay Catchment (code: 09). The area of this catchment covers 1,624,42km^2 and supports a total population density of 777 people per km^2.

4.4.2 Surface Waters

Surface Waters: Dublin city has river water bodies monitored under the WFD: including the Liffey, Tolka, Santry, Dodder and Camac rivers. Dublin city also has four transitional waterbodies (estuaries) – the Upper and Lower Liffey estuary, the Tolka estuary and North Bull Island Estuary. The entirety of Dublin city's coastline falls within the Dublin Bay coastal water body. There are no lakes within the city

4.4.3 Groundwater:

Groundwater is a further significant resource and refers to water stored underground in saturated rock, sand, gravel, and soil. Surface and groundwater functions are closely related and form part of the hydrological cycle. The protection of groundwater from land uses is a critical consideration and groundwater vulnerability is becoming an important management tool. The entire island of Ireland has been designated as a Protected Area for Groundwater under the WFD.

Groundwater is important as a drinking water supply as well as the supply to surface waters. In addition, groundwater supplies surface waters. Groundwater is exposed to higher concentrations of pollutants that are retained in the layers of rock and soil. The exposure to pollutants lasts much longer as groundwater moves at a slower pace through the aquifer. The quality of our drinking water supply, fisheries and terrestrial based habitats is intrinsically linked with groundwater quality. The Geological Survey of Ireland (GSI) aquifer categories are based on their vulnerability to pollution, i.e. the ease at which it can enter the subsurface layers. The classification of extreme or high vulnerability means that the groundwater in these areas is very vulnerable to contamination due to hydrogeological and soil factors.

[12] From Catchments.ie

The overall status of the Groundwater is good; the main risks are from urban derived pressures.

4.4.5 Coastal Waters

Marine Spatial Planning (MSP) will be a key requirement and challenge in planning for climate change in Ireland as a coastal county, will be of particular relevance to the local authority.

Directive 2014/89/EU established a framework for MSP and details the main goals (Article 5) and minimum requirements (Article 6). The Marine Spatial Plan must be in place by March 2021.

There are three designated bathing waters within the Dublin City Council area at Dollymount, Merrion Strand and Sandymount. Regular monitoring of bathing water quality is carried out during the bathing season in conformance with the requirements of the Bathing Water Quality Regulations 2008 (S.I. 79 of 2008).

Three Bathing waters are present in the Plan area –Dollymount, Sandymount and Merrion Strand. All three bathing waters were in compliance with the EU mandatory and the Irish national standards for bathing water quality in 2013. The most recent data is for 2017 and shows Dollymount and Sandymount achieving excellent/good quality broadly throughout the survey period; Merrion is recorded as having poor water quality on 9 survey days over the bathing season[13].

4.4.4 Register of Protected Areas (RPA)

Protected areas are areas that have been designated as needing special protection because of their particular importance for use as bathing waters, drinking water supply, growing and harvesting of shellfish, conserving sensitive habitats and species or because they are particularly affected by eutrophication due to excessive inputs of phosphorus and/or nitrogen. The River Liffey and Estuary are listed on the RPA for Nutrient Sensitive Waters. Nutrient Sensitive Areas comprise nitrate vulnerable zones designated under the Nitrates Directive (91/676/EEC) and areas designated as sensitive under the Urban Waste Water Treatment Directive (91/271/EEC).

4.4.5 Flood Risk

The Planning System and Flood Risk Management, Guidelines for Planning Authorities, 2009, issued by the DoEHLG and undertaken in conjunction with the OPW, requires Planning Authorities to prepare a Strategic Flood Risk Assessment (SFRA). The primary purpose of the SFRA is to determine flood risk within a particular geographical area. It should be noted the SFRA is an ever evolving document, which is to be reviewed and updated on a regular basis in the light of emerging information, flood data and an improved understanding of flood risk.

A Strategic Flood Risk assessment was undertaken for the County Development Plan.

The highest tide ever recorded in Dublin City was on 3rd January 2014 reaching 3.014 metres in Malin. The second highest tide recorded was on 1st February 2002 at 2.950 metres in Malin. These were the highest tides recorded for the last 400 years, and possibly longer for Dublin Bay. To reduce vulnerability to sea level rise, a minimum safety of four metres above present sea level in the east coast of Ireland is recommended; this accounts for a rise in sea level of 0.5 metres, a storm surge of 2.95 metres, and a safety margin[21].

[13] http://www.dublincity.ie/bathingwater. Accessed on 28th January 2019.

It is important to note that sea level rise, while an important phenomenon to understand for Dublin City, is only one element that contributes to flooding issues in the City. It is also important to understand the other elements which, when combined with rising sea levels, contribute to flooding. This includes combinations of extreme tide levels, which are made up of astronomic tides and storm surges (fluctuations in water level due to atmospheric pressure, wind speed, seiches, etc) and wave action.

4.4.6 KEY ISSUES: WATER RESOURCES

The SEA ER of the DCC County Development Plan 2016-2022 highlighted the following issues:

- Some surface waters are at significant risk of failing to achieve the WFD objective of 'good' status in 2015. Of the transitional waterbodies present in Dublin city, the Lower Liffey Estuary is currently at 'good' water status while the Tolka and North Bull Island Estuaries are at 'moderate' status. The Dublin Bay coastal waterbody is at 'good' status, and both groundwater bodies in Dublin city are currently at 'good' waterbody status.
- All river waterbodies however are currently at 'moderate' to 'poor' status. It should be noted that the quality of river waters flowing into the Dublin City Council area are to a large extent determined by activities in the upstream catchments in adjoining local authorities. However, the management of water quality on a single national river basin district under the Water Framework Directive should lead to a more integrated approach to the management of the all river catchments.
- The main pressures to rivers in Dublin city are upstream pollution, combined sewer overflows, misconnections of wastewater from individual houses and urban runoff.

Flooding is a natural process that can happen at any time in a wide variety of locations and plays a role in shaping the natural environment. Dublin city is most vulnerable to two key sources of flooding – fluvial and coastal. The challenge for Dublin city is to reduce the flood risk in the city to the National Flood Standards to above 1% annual exceedance probability (AEP) (or roughly 100 year flood event) for fluvial flooding and above 0.5% AEP (roughly 200 year flood event) for tidal flooding, as far as is reasonably possible.

Other issues relating to water and climate change include coastal flooding and erosion, sea level rises and settlement, infrastructure and alteration of coastal habitats including estuaries.

- Avoiding the spread of alien and invasive species
- Opportunities to integrate blue infrastructure measures through flood risk management.

FIGURE 7 RIVERS IN DUBLIN CITY

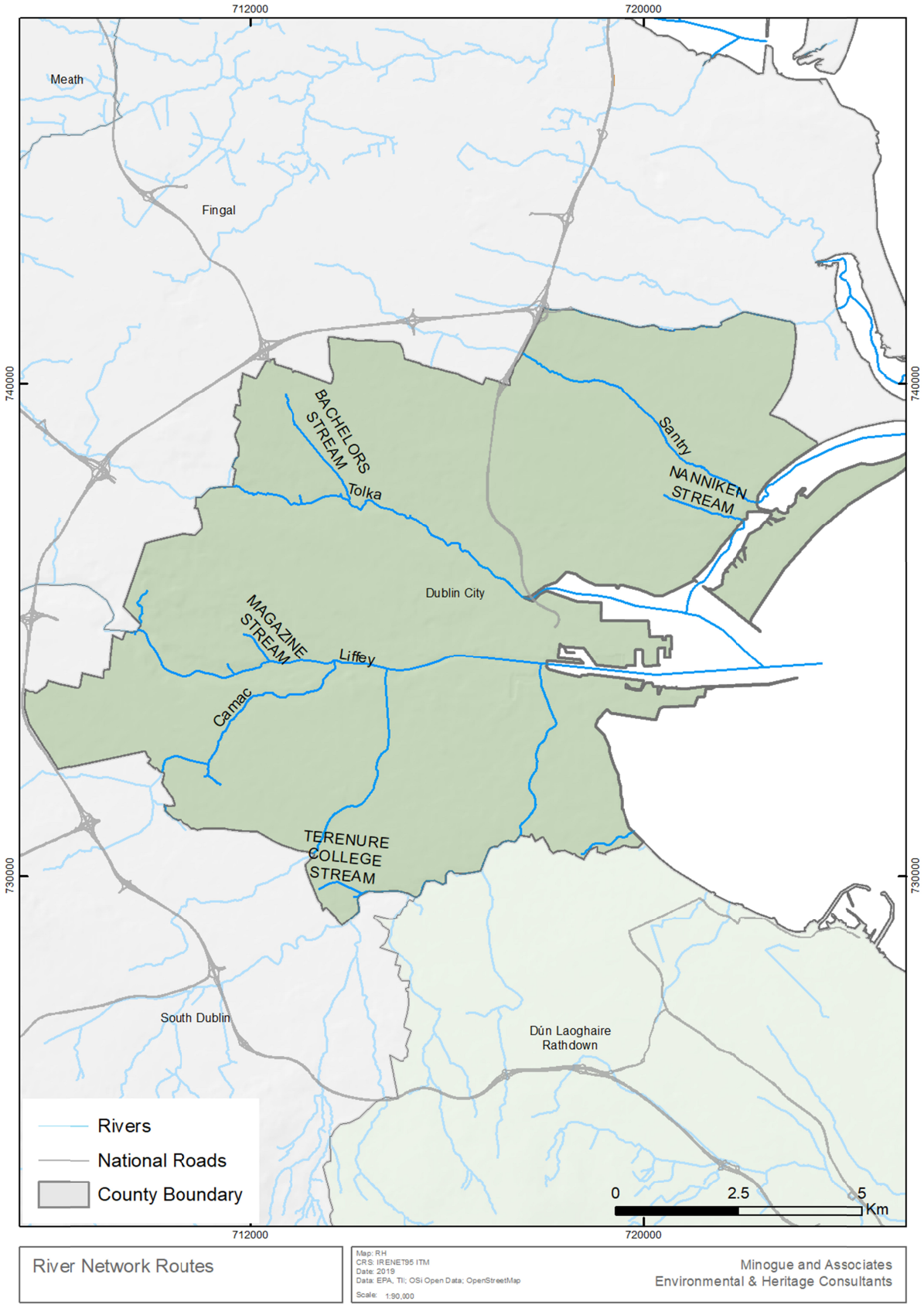


FIGURE 8 WATER FRAMEWORK DIRECTIVE SUBCATCHMENTS OF DUBLIN CITY

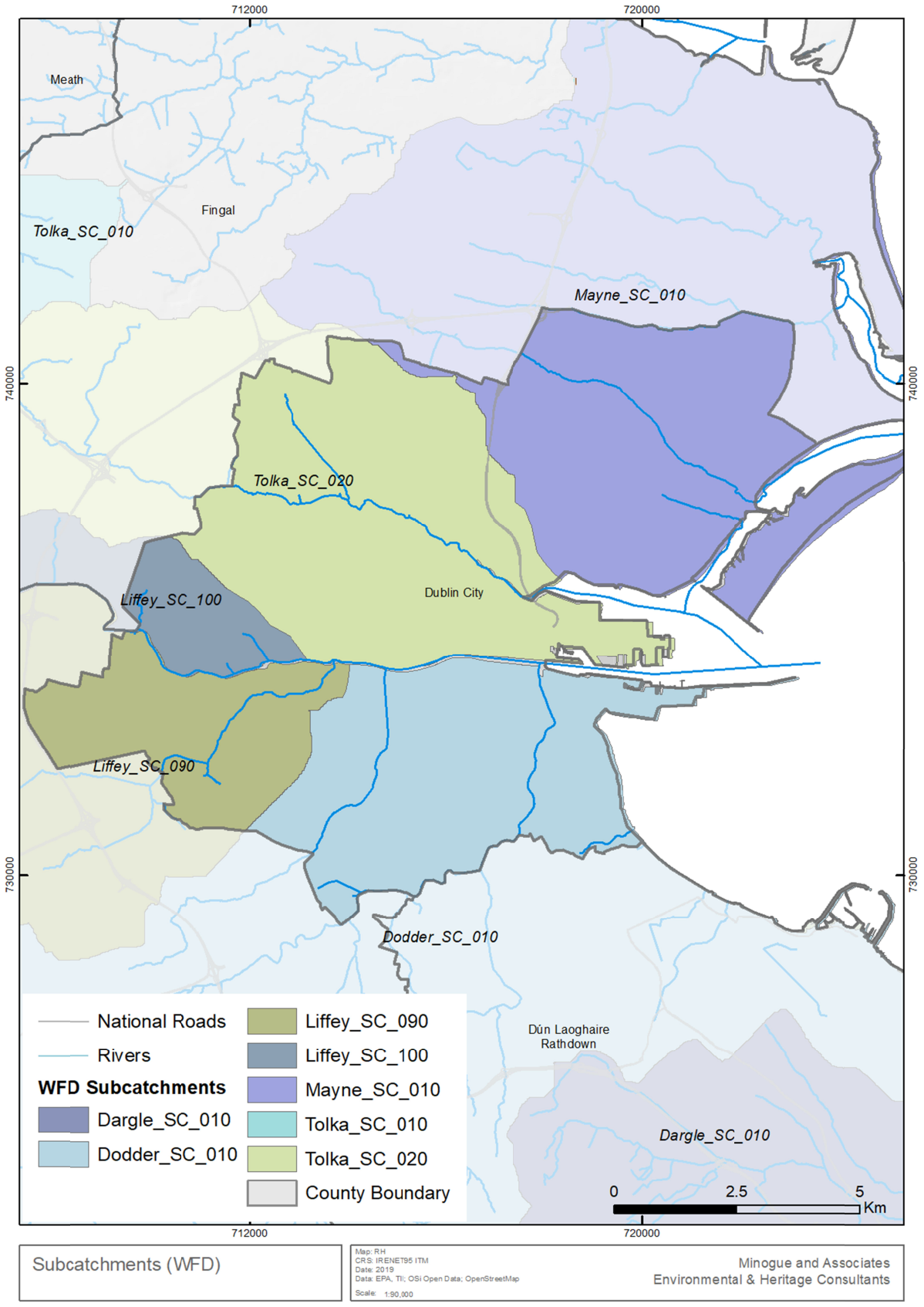


FIGURE 9 WATER QUALITY OF SURFACE WATER DUBLIN CITY

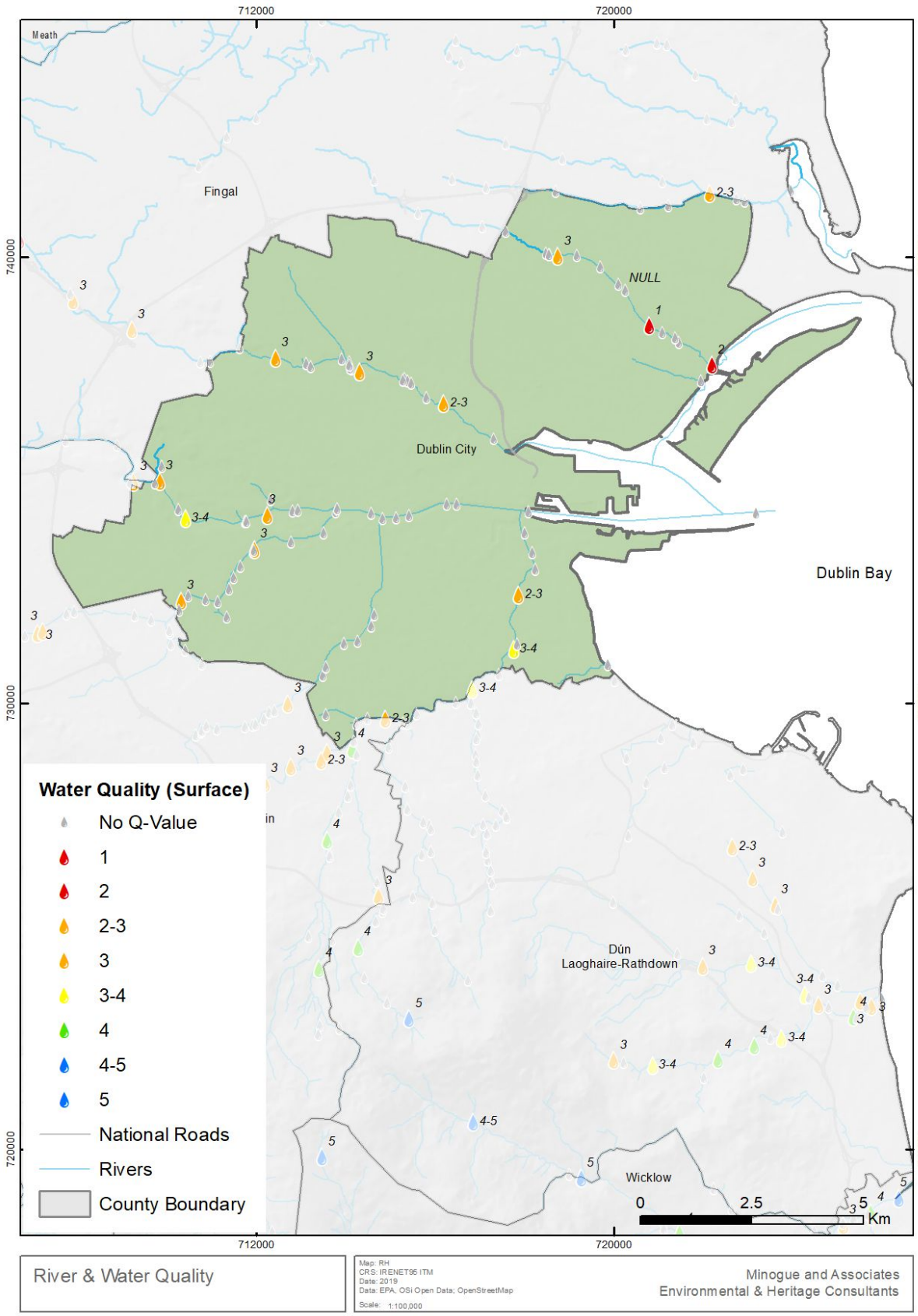
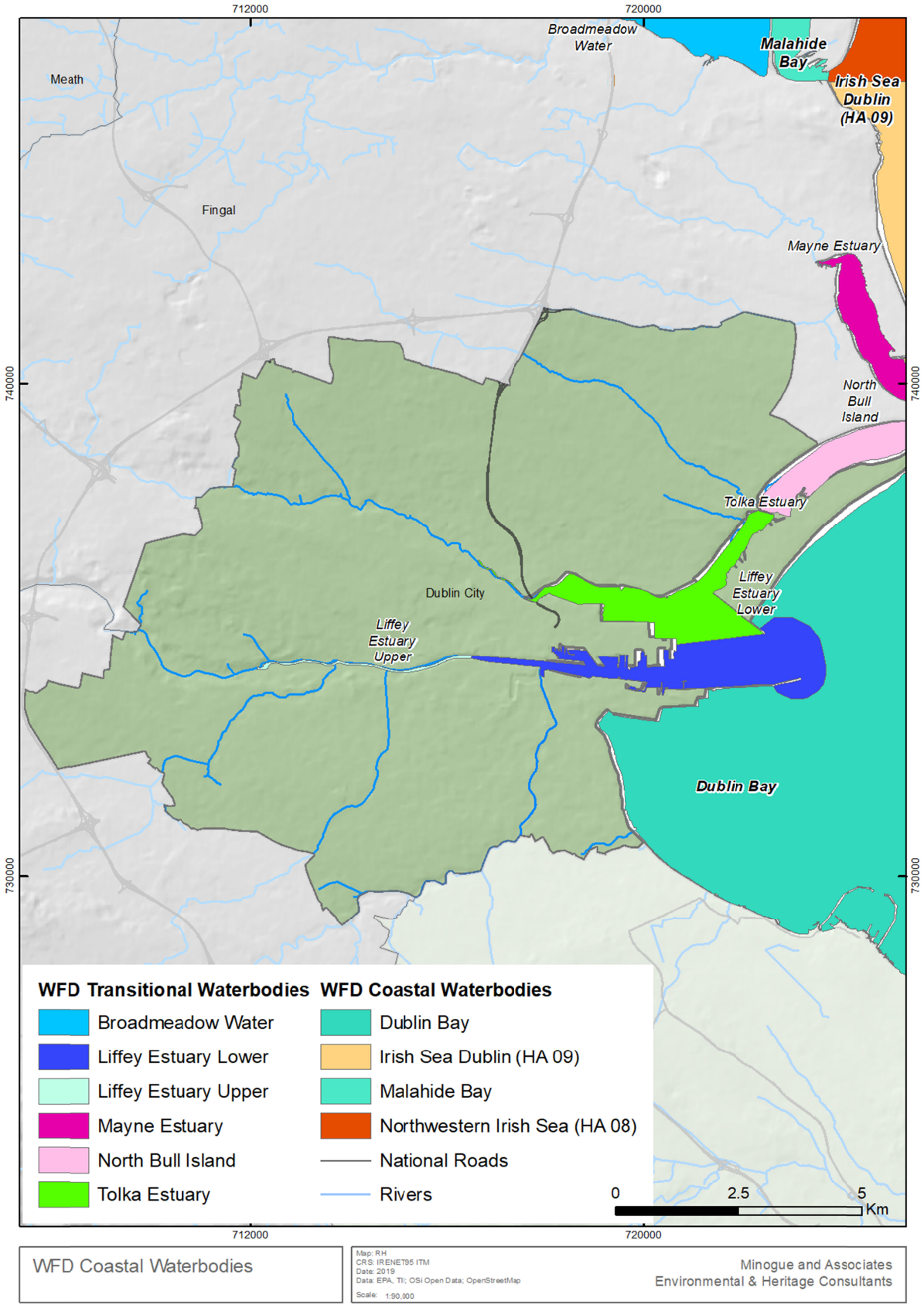


FIGURE 10 COASTAL WATERBODIES UNDER THE WFD FOR DUBLIN CITY



WFD Coastal Waterbodies

Map: RH
CRS: IRENET95 ITM
Date: 2019
Data: EPA, Tii; OSi Open Data; OpenStreetMap
Scale: 1:90,000

Minogue and Associates
Environmental & Heritage Consultants

4.5 Soil and Geology

4.5.1 Geology

Bedrock geology in the county comprises limestone, see **Figure 11.** There are also number of Geological Heritage Sites in the County, see **Figure 12.**

4.5.2 Soil

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.

There is no overarching soil legislation in place currently, however the 7th Environment Action Programme (EAP) recognises the challenge of soil degradation and provides by 2020 that land be managed sustainably with soil adequately protected.

The soil of Dublin is derived from glacial till of Irish Sea origin, with limestone and shale and is largely comprised of grey-brown podzols. Lighter-textured grey-brown podzolics are good all-purpose soils, while heavier-textured members are highly suited to pasture production, responding well to manurial and management practices. The coast of Dublin has a layer of alluvium overlying the topsoil, which is a result of the low-lying status of the city. This sequence of soils remains only in undisturbed areas of the coast. As Dublin is a very built-up city, much of the topsoil and alluvium have long since been removed.

Given the historical landuse, systematic geochemical mapping of soils in the greater Dublin area was undertaken as part of a EU project. Over 1000 samples were taken across the greater Dublin area, including the sampling of 368 points within Dublin city's public parks and open spaces. Results show that inner city soils typically have higher levels of potentially harmful elements and organic pollutants than areas towards the outer city; this is a pattern seen in many cities around the world and can be tied to historical industrial activities as well as fossil fuel burning and use of leaded paints and fuels. Polycyclic aromatic hydrocarbons (PAHs) are also present in the soil, reflecting historic coal burning and other historic industrial emissions, as well as more modern transport-related emissions. The presence of polychlorinated biphenyls (PCBs) is likely associated with historic industrial activities and paint particles in the soil.

A significant portion of Dublin City is built on reclaimed or infilled land. This reclamation began back in the eighteenth century. The North Docklands were reclaimed between 1717 and 1729. A 1 km stretch of land between the city centre and the river Dodder was reclaimed by Sir John Rogerson between 1917 and 1927. North Lotts and East Wall were reclaimed by the end of the 1750s. A bank was constructed along the present South Lotts Road by 1760. The area between these banks was gradually reclaimed together with adjoining areas of the Dodder estuary. The dry dock between the Grand Canal Dock and the Dodder was filled in

1918. Reclamation continued progressively in an easterly direction from the beginning of the nineteenth century. Traditionally the material used for reclamation in Dublin included construction and demolition waste, waste topsoil and municipal and industrial wastes. For example, Ringsend Park was originally a landfill site of unknown material and has only a thin layer of topsoil. The existing promenade along Strand Road was also infilled with landfill materials.[14] Many of the city's parks were built over landfill sites, including Fairview Park and Tolka Valley Park.

It is important to both recognise and promote this role in terms of the carbon storage capacity of soil, potential biodiversity and water benefits (subject to agricultural practice) and food security. **Figure 13** presents the county soil map.

4.5.3 Existing issues: Geology and Soil

- Maintaining and enhancing soil function and its carbon storage role where possible.
- Addressing extent of soil sealing, increased surface run off and poor permeability of lands in the county
- Retention and creation of areas of greenfield in terms of open space, green infrastructure, permeability and biodiversity considerations.
- Promoting soil conservation and food security in areas of agricultural production in the county.

Because of the complex interrelationship between water, air and soil, declining soil quality can contribute to negative or declining water or air quality and function.

[14] Environmental Impact Statement, Sutton to Sandycove (S2S) Project.

Figure 11 Bedrock Geology

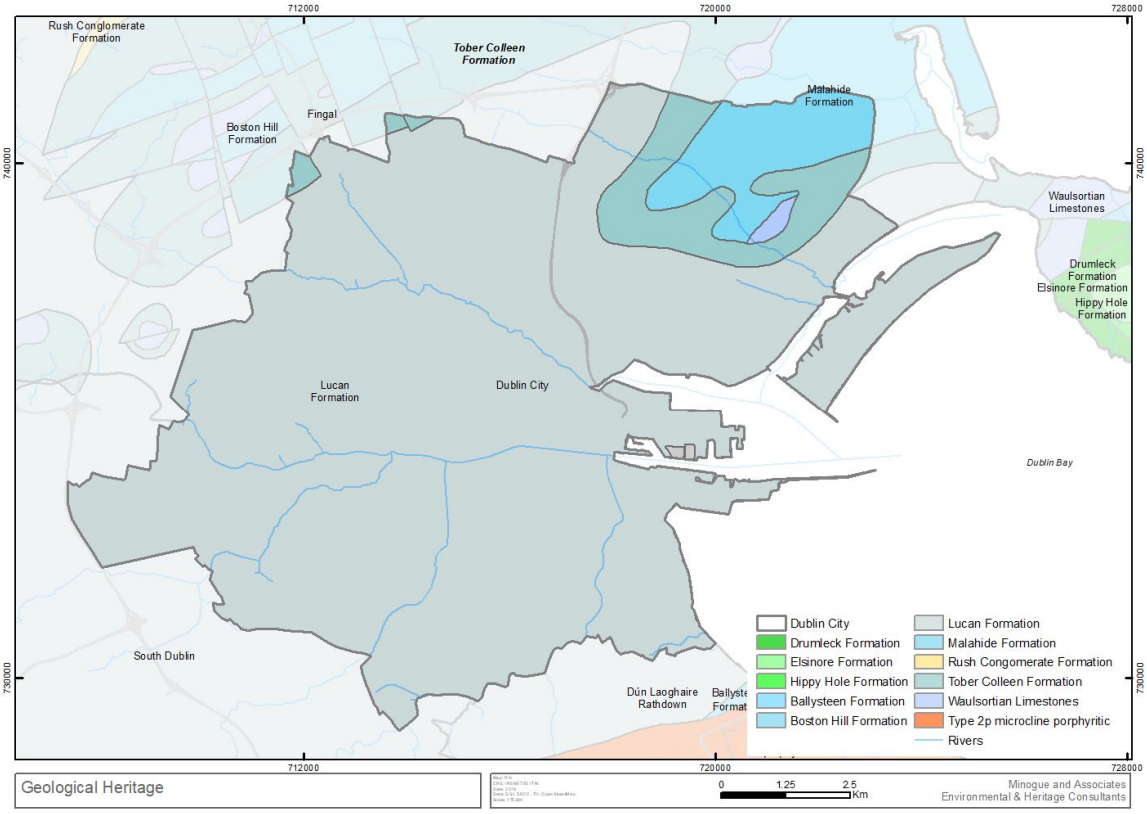


FIGURE 12 GEOLOGICAL HERITAGE SITES IN THE COUNTY

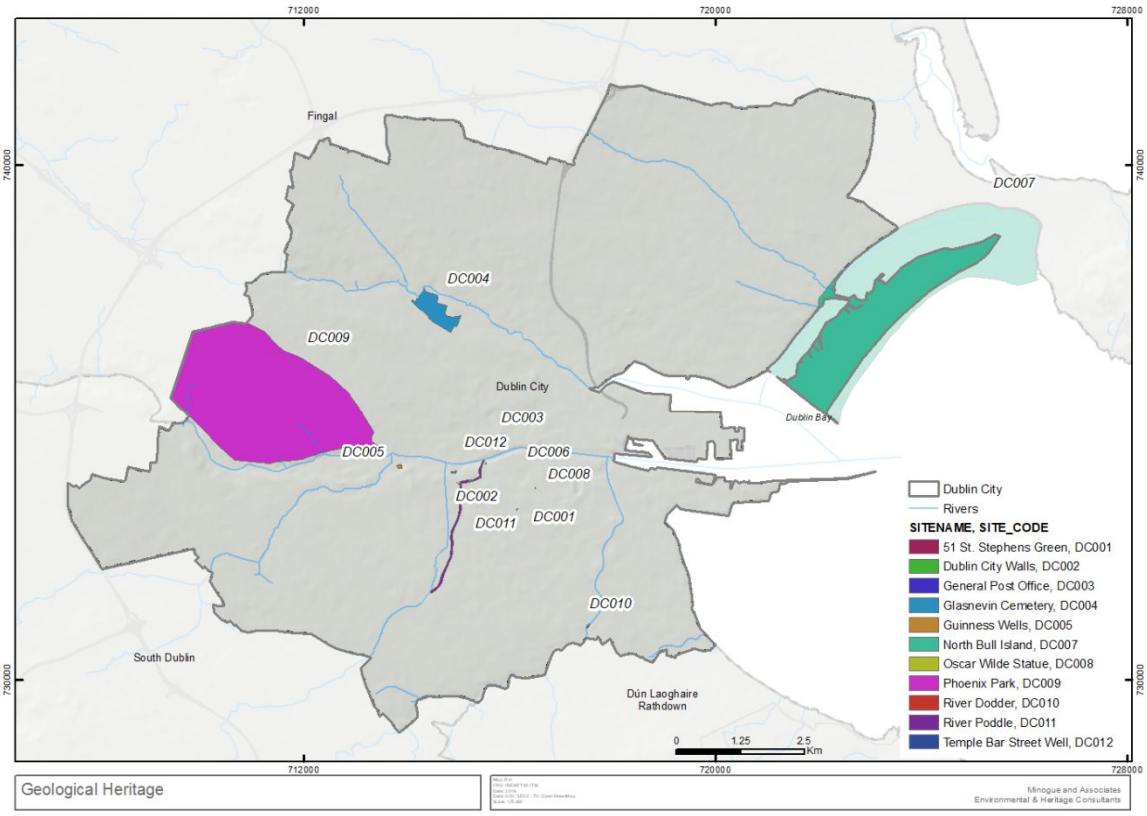
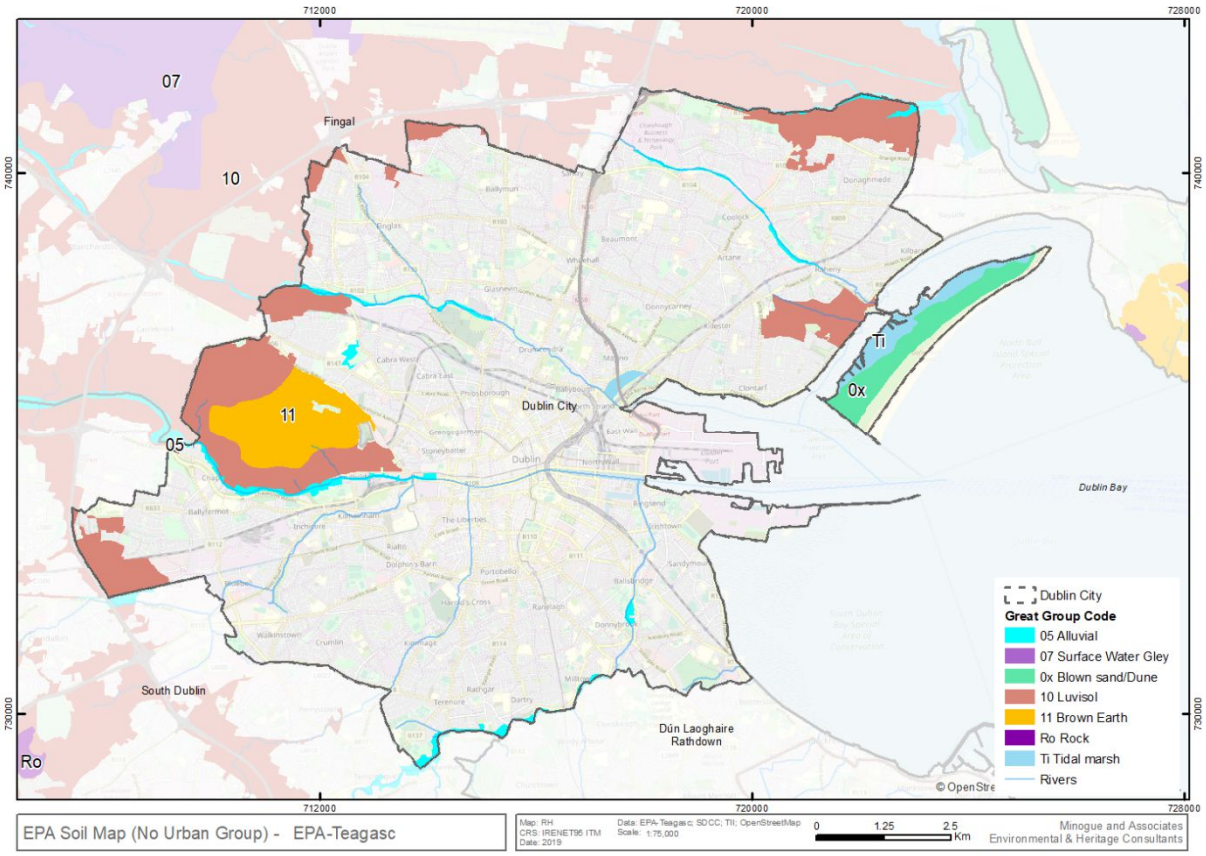


FIGURE 13 SOIL MAP OF THE COUNTY



4.6 Cultural Heritage

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

Dublin is an ancient city with many sites of archaeological, architectural and cultural heritage importance. As a vibrant and expanding city, there is a continuing need to balance day to day operations with protection of the cultural resource that is so much a part of the fabric of Dublin and one of the key draws for the tourism industry.

4.6.1 Archaeology

Archaeological heritage is defined as including structures, places, caves, sites, features or other objects, whether on land, underwater or in inter-tidal zones. All archaeological structures, constructions, groups of buildings, development sites, all recorded monuments as well as their contexts, and moveable objects, situated both on land and underwater are part of the

Therefore the archaeological heritage of the area is not confined to the archaeological sites within the Record of Monuments and Places. It also includes

any archaeological sites that may not have been recorded yet, as well as archaeology beneath the ground surface, or underwater as well as the context of any such site discovered.

Dublin City Council is rich in archaeology and has a diverse range of monuments covering a number of historic eras. It is deemed that the plan area is of high archaeological potential due to the potential for the presence of hitherto unknown sub-surface archaeological remains. This determination is based on the presence of substantial archaeological remains from many periods of the past within the city area. Dublin originated first as two separate monastic enclosures (Átha Cliath and Linn Dubh), and then as a fortress for Viking ships on the Liffey.

After the Anglo-Norman invasion of 1170, the walled city expanded reclaiming land at wood quay and large suburbs developed to the north (Oxmantown), to the south and west around Ship Street and St Patrick's Cathedral and the Liberties. On the outskirts were villages such as Chapelizod, Finglas and Donnybrook, etc.

Much of the medieval city was still intact in 1610 when John Speed mapped it for the first time. During the eighteenth century however, the Wide Streets Commission reshaped the old medieval city, and created a network of main thoroughfares by wholesale demolition or widening of old streets or the creation of entirely new ones. The result is that it is difficult to grasp the form of the old city or to understand the context of surviving medieval fabric/street patterns at ground level. Nevertheless, much remains that is of value and which can be reinforced or stitched back together and presented in the city's renewal. A clear strategic vision is required for the oldest part of the city. The City Walls Conservation Plan goes some way to addressing this but should be extended to address the suburbs as a second phase.

Given the limited development in recent years, there have been fewer opportunities to conduct archaeological investigations, given the likely presence of sub-surface archaeology. Church curtilages are important historical resources and can often be used for recreation and amenity purposes as well however this may also lead to the disturbance of archaeological features.

Industrial Heritage

From around 1750 onwards, numerous large-scale industries developed in Dublin which had a profound effect on the city's economy and society, and which contributed greatly to the physical character of the city today. The term 'industrial heritage' covers everything from the extraction of raw materials, manufacturing and processing into usable forms or finished products, public utilities, transport, communications and energy production. In some contexts it also includes military maritime and institutional functions. It is an aim of the plan to minimise interference in original maritime and transport-related heritage in order to protect docks, quays, sea walls and historic industrial fabric where possible.

The importance of industrial heritage in the shaping of Dublin city cannot be underestimated. The Guinness Brewery is one of Dublin's most important industrial heritage sites and Guinness is identified as a significant brand internationally and is inextricably linked with the capital. With the exception of Guinness however, industry is currently a critically underutilised and undervalued aspect of Dublin's built heritage.

A key issue in the conservation of the city's built heritage is recording and conserving Dublin's unique industrial heritage, a substantial portion of which has already disappeared without record. Industrial buildings are not always of high architectural significance and so are poorly represented on the Record of Protected Structures for this reason. The National Monuments Act (amended) protects sites and monuments down to, but not after, 1700 AD. In this way, industrial heritage has continually fallen between the two primary statutory instruments for protection of built heritage. Dublin City Council has undertaken an inventory of industrial heritage. The Dublin City Industrial Heritage Record (DCIHR) and the Development Plan have regard to this record.

UNESCO World Heritage

To build on the city's civic identity, the historic centre of Dublin city is currently on Ireland's Tentative List of UNESCO World Heritage Sites.

4.6.2 Built Heritage

Part IV of the Planning and Development Act 2000 (as amended) defines the term "architectural heritage" as structures and buildings together with their settings and attendant grounds, fixtures and fittings, groups of structures and buildings and sites, which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest, and "where a structure is protected, the protection includes the structure, its interiors and the land within its curtilage (including their interiors) and all fixtures and features which form part of the interior or exterior of all these structures".

An Architectural Conservation Area (ACA) is a place, area, group of structures or townscape that is of special, architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or value, or contributes to the appreciation of protected structures.

There are currently just over 9000 structures listed for protection in the Record of Protected Structures; Dublin City Council is currently revising and updating this register. These structures include individual houses, warehouses, shop fronts, churches, boundary walls, bridges, building exteriors etc. A considerable number of these buildings are considered to be of Local Importance under the National Inventory of Architectural Heritage (NIAH) Guidelines.

In addition to the Record of Protected Structures, structures of architectural heritage merit, although not put forward for inclusion in the Record of Protected Structures (RPS) may be of local value and may continue to contribute to the identity of a particular area of the city. The development plan seeks to actively protect buildings/structures of heritage value, which may not be protected, but which make a positive contribution to the area and identity of the city. Dublin city is unique in form and character. The contributions of any features, which give identity to and enhance that uniqueness, have been given recognition in the preparation of the Plan.

Figure 15 shows the archaeological recorded sites in the County and **Figures 16** and **17** shows the Record of Protected Structures, ACAs and Conservation Areas.

4.6.3 Existing Issues: Cultural Heritage

- Potential for additional archaeological resources
- Adapting older buildings to become more energy efficient or enhance their energy efficiency

- Potential climate change effects on built heritage associated with more extreme climate events.
- Given the spatial concentration of many built heritage features associated with the coastline of DCC the potential effects of sea rises, and surges could increase effects on these features and their settings.
- Protected structures close to flood risk areas
- Increased storm activity has implications for those coastal sites prone to erosion;
- Coastal defence construction pressures such as construction of sea walls, gabions, rock armour revetments and groynes.

  These influences may result in damage to archaeological features in the coastal zone (e.g. middens) and intertidal and subtidal areas (e.g. shipwrecks).

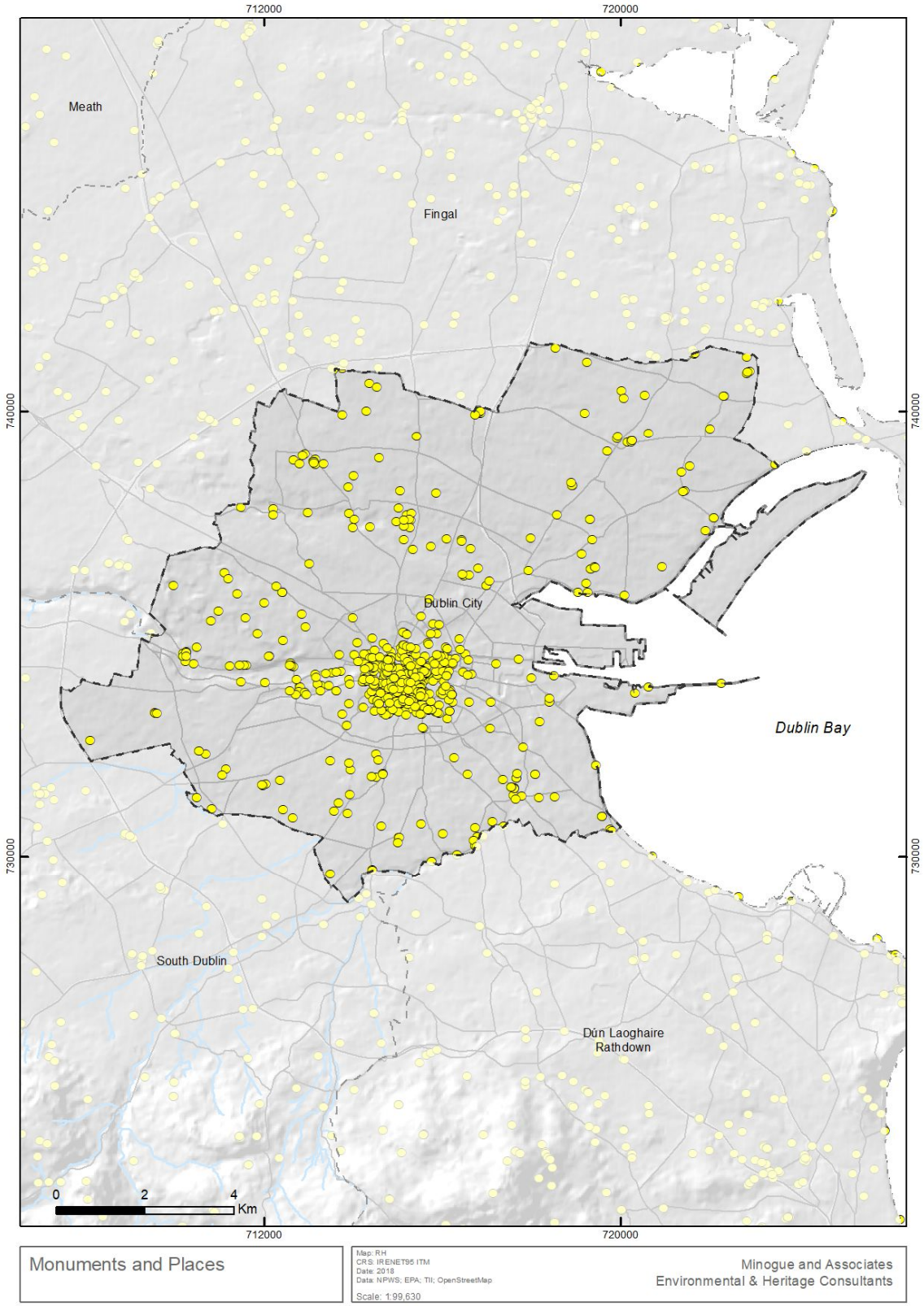


FIGURE 14 SITES AND MONUMENTS DUBLIN CITY

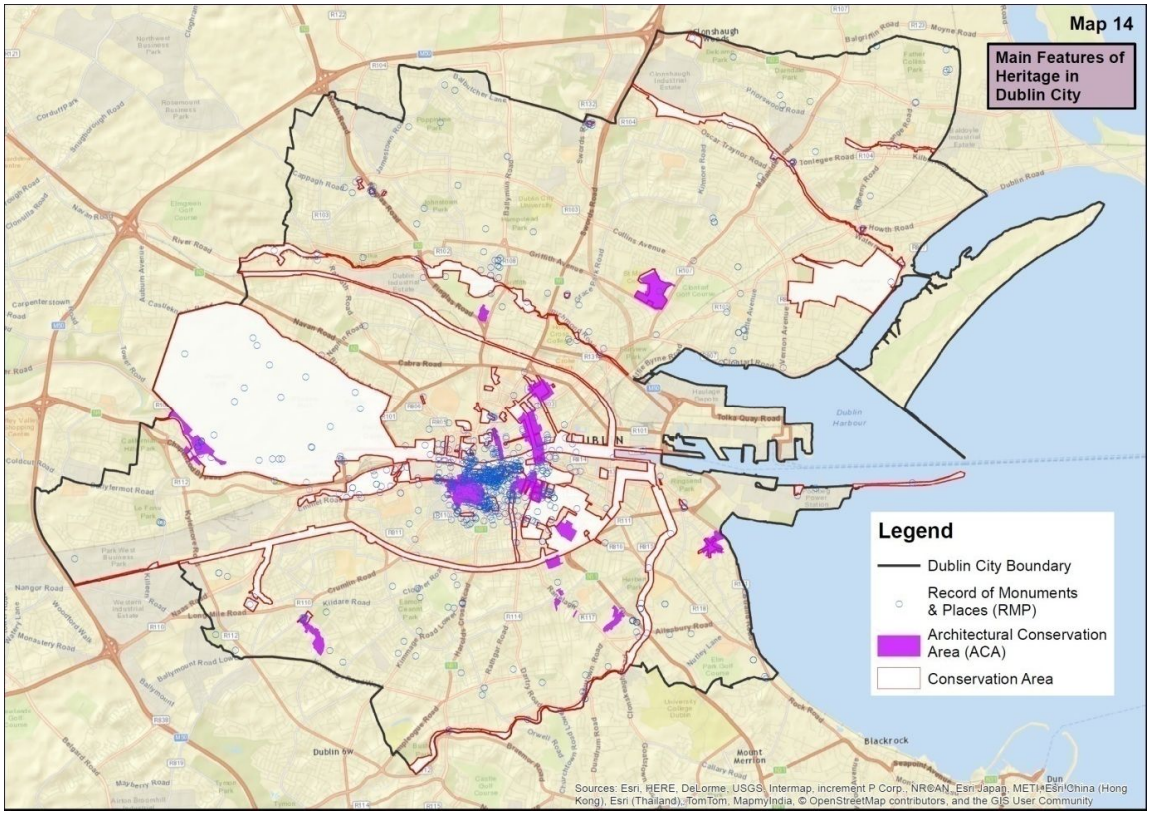
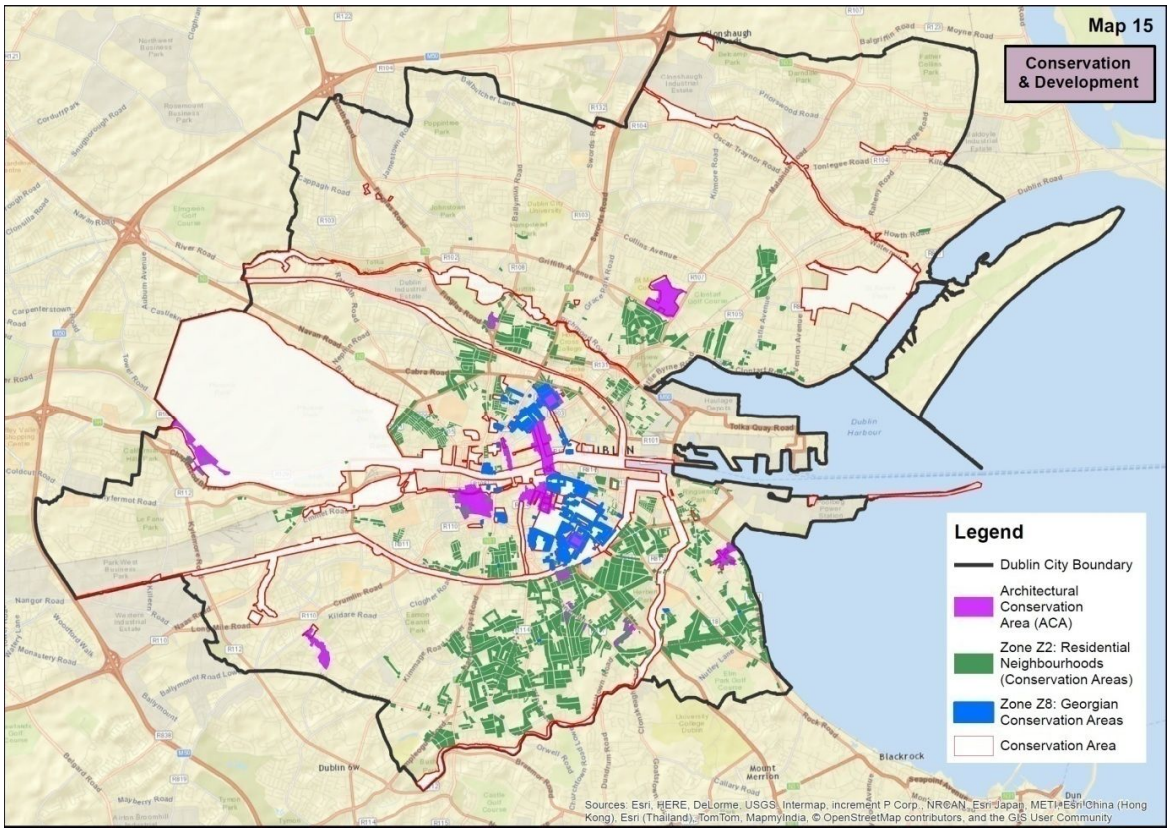


FIGURE 15 RMP, ACAS AND CONSERVATION AREAS DUBLIN CITY (FROM SEA ER OF DUBLIN CITY CDP)

FIGURE 16 CONSERVATION AREAS IN DUBLIN CITY



4.7 LANDSCAPE

Landscape consists of the public and private landscape of the city. It fulfils an array of environmental, ecological, social, recreational and aesthetic functions of the developing city. Dublin City has significant green spaces through the provision of parks such as the Phoenix Park, St Anne's Park and a number of institutional lands, including Trinity College Dublin.

The city's parks, institutional lands, private gardens and graveyards all contribute significantly to the biodiversity resource in the city. Remaining hedgerows, semi-natural grasslands and trees are of particular importance.

The city's landscape and parks contain significant wildlife resources, including woodland, semi-natural grasslands and remnant hedgerows. In this way, Dublin's city's parks support species of local and national importance, including otters, bats, hedgehogs and kingfishers. The city's parks also play a significant amenity and educational role in the city.

The townscape of the city is as significant as it creates and contributes to the urban character. This varies within the City, from the older medieval areas to Georgian Dublin and newer redevelopment areas such as the Grand Canal Dock.

Key vistas and viewpoints/landmarks in the city also contribute to local character and include the Grand and Royal Canals, coastal views as well as various tall structures including church steeples and landmarks such as Wellingtons Column in the Phoenix Park.

4.7.1 EXISTING ISSUES: LANDSCAPE

Landscape measures represent a key opportunity to adapt and respond to climate change impact through the following

- Blue and green infrastructure planning and delivery
- Allowing for landscape scale response to increased water levels and flood risk
- Planning for ecological connectivity
- In terms of climate change and landscape issues, potential issues including alteration of landscapes associated with changing vegetation , for example changing forestry practices, increased surface water and drying out of wetter, acidic soils.

4.8 Air quality and Climate

4.8.1 Air Quality

The Air Quality Index for health (EPA) provides air quality information with health advice for both the general public and people sensitive to air pollution. The index is displayed on a colour-coded map, updated hourly. The index is based on information from monitoring instruments at representative locations in each region. Dublin City is located within the 'Dublin City' region. Air Quality is generally classified as 'good'.

Further information on Air Quality and Human Health is provided in Section 4.2.4.

4.8.2 Climate Change and Greenhouse Gas Emissions

Adaption and responding to climate change is a key objective the CCAP and the following baseline is taken from the DCC CCAP. The adaptation baseline has identified that the effects of climate change are already impacting Dublin City at a significant rate and are very likely to increase in their frequency and intensity.

The number of days with heavy rainfall has increased and the amount of extreme flooding events has also risen in the last 10 years. Dublin City has also experienced extreme temperatures, as witnessed recently in 2018, with Met Éireann issuing its first ever Status Red warning for snow in February, followed by one of the hottest summers on record during June and July.

All these extreme weather events clearly highlight the need to reduce the impacts that climate change is having on the environment, the economy and the citizens of Dublin.

DCC Local Authority Emissions

Dublin City Council (DCC) is responsible for the energy use and emissions from its buildings and facilities, its public lighting, and also from its vehicle fleet. The information from the Sustainable Energy Authority of Ireland's (SEAI's) Monitoring and Reporting (M&R) database shows that DCC consumed a total of 186 gigawatt hours (GWh) of primary energy in 2017. The energy database also shows that DCC improved its energy performance by 29.8% between the baseline year (which is an average of between 2006 - 2008) and 2017, which represented a cumulative absolute saving of 39.9 GWh of primary energy during the same period.

This highlights a gap-to-target of 3.2%, meaning that DCC must improve its energy performance by a further 3.2% between now and 2020, in order to meet its 33% energy reduction target.

Buildings and facilities were the highest energy consumers, accounting for 63% of the Council's overall primary energy consumption. This is mainly due to the large number of Council-owned buildings. Public lighting was the second highest energy consumer, accounting for 25% of the total energy consumption, while the municipal fleet accounted for 12% of the total energy use.

As a signatory to the Covenant of Mayors for Climate and Energy, DCC is committed to reducing its own carbon emissions by 40% by 2030, compared to the baseline year.

DCC's emissions decreased from 53,240 tonnes of CO2 in 2006 to 40,370 tonnes of CO2 in 2017. This means that DCC is now 8,430 tonnes of CO2 (16%) away from the 2030 target of a 40% emission reduction from its baseline year.

In 2017, the Council's total emissions amounted to 40,370 tonnes of CO2.

Buildings and facilities were the highest contributors, accounting for 55% of total emissions. This was followed by public lighting and the municipal fleet, each contributing 32% and 13% to the Council's emissions, respectively.

Total Dublin City Emissions

The most recently-available information for total emissions in the entire Dublin City area is based on Census 2016 data. Using this data, Codema was able to calculate that the total emissions for the Dublin City area amounted to 2,810,880 tonnes of CO2 equivalent in 2016. The sectors that produced the most emissions were the residential, commercial and transport sectors, accounting for 35%, 33%, and 25% of the total emissions, respectively. Dublin City Council's own emissions accounted for 1.4% of this total, with social housing contributing another 3.3%. This highlights the need for collaboration and action from all stakeholders to tackle the remaining 95.3% of emissions from public and private sector sources in Dublin City.

4.8.3 Key Issues: Air Quality and Climate

The SEA ER of the Dublin City Development Plan 2016-2022 identified the following issues:

- Best practice methods for energy efficiency, energy conservation and water conservation, e.g., district heating network, combined heat and power systems, energy efficiency
- Continued regard to the Sustainable Energy Action Plan.
- Feasibility of renewable energy sources throughout the city.
- Further reductions in CO2 emissions required
- Rising sea levels. Pluvial (rainfall) and coastal flood risk from changing land-use patterns and climate change.
- Importance of city vegetation/ landscape to act as a carbon sink.
- Pressure from transport-related emissions.
- Greater co-ordination with the other planning authorities in the Greater Dublin Region to respond to these shared regional issues set out
- Planning for and adapting to climate change.

The risks associated with sea level rise in DCC are:

• Coastal deposition and damage to existing defences from increased wave heights at the coastline. This will greatly affect coastal habitats, with estuaries and wetlands particularly vulnerable

• Changes in coastal morphology, changes in sea level with an increase in intensity of coastal storms tend to exacerbate coastal erosion and deposition risk

• Increased pressure on sanitation systems - sea level rise can result in overflows from combined drainage systems being unable to function, resulting in increased flood risk on land. Also, as wastewater treatment plants and sewage pumping stations are often located close to the coast, these facilities are at particular risk.

• Damage to critical infrastructure and housing from coastal flooding and sea level rise. These results in economic and social risks to DCC especially since some housing and major infrastructure (roads, DART lines) are along the coast

- Increased wave heights and high tides producing damage further inland and upstream

- Destruction and alterations of coastal and marine ecosystems, habitats and species

4.9 Material Assets

The EPA SEA Process Draft Checklist (2008) defines material assets as the critical infrastructure essential for the functioning of society such as: electricity generation and distribution, water supply, wastewater treatment, transportation, etc. An overview is provided below.

4.9.1 Transport

The Dublin City Council area covers an area of approximately 115 km^2 and is populated by 527,612 people. Within its boundaries there are just over 31 km of Irish Rail track and now the Luas Cross city, Red and Green lines traverse parts of the city. The entire rail track within the Dublin City Council area is designated as major rail.

Existing Road Network:

A total of circa 1,200 km of road is currently in the charge of Dublin City Council. The roads are of varying quality and are maintained on a demand/priority basis.

Most of the information readily available relates to the city centre, i.e., the area within the canals. The National Transport Authority notes that in total 192,670 people access the canal to the city centre in the morning peak (7.00 a.m. to 10.00 a.m.) by all modes of transport.[15] This number is projected to increase significantly by 2020. It is also reported that 64,169 people accessed the city centre by car at peak time. The network within the city centre, i.e., the canals is full at 20,000 cars.

[15] Report on trends in mode share of vehicles and people crossing the Canal Cordon 2006-2014. National Transport Authority and Dublin City Council (2015).s

Cycle

To date a total of circa 191 km of cycle lanes have been provided within the Dublin City Council area (SEA ER of Dublin City Development Plan 2016-2022). This is made up of both segregated lanes and combined bus and cycle lanes. The cycle lanes provided form part of a citywide cycle network.

Construction was completed on a bicycle rental scheme for the city centre, Dublin's City Bikes, and the scheme began operation in September 2009. The scheme has been extremely successful, beginning with 450 bikes at 40 stations and expanding to 550 bicycles at 44 stations in 2011. In 2013 a major expansion was announced, to add a further 950 bikes and 58 additional hire stations. Dublin is the seventeenths city to have implemented such a bike scheme and is one of the most successful in the world

It is estimated that there is approximately 2,400 km of footpath within the City Council area. This is of varying quality and it is maintained on a demand/priority basis.

In June 2015 the NTA and Dublin City Council published their joint Dublin City Transport Study which sets out proposals to enhance movement within and across the city and to facilitate a modal shift to greater use of public transport, cycling and walking.

Figure 19 shows rail and light rail in the county.

4.9.2 Water Services

The treatment of wastewater is governed by the Urban Waste Water Treatment Directive (91/271/EEC) (amended by Directive 98/15/EEC) transposed into Irish law by the Urban Waste Water Treatment Regulations 2001 (SI 254 of 2001) and the Urban Waste Water Treatment

(Amendment) Regulations 2004 (SI 440 of 2004). The Directive aims to protect the environment from the adverse effects of the wastewater discharges by ensuring that wastewater is appropriately treated before it is discharged to the environment. The treatment of wastewater is relevant to the Water Framework Directive which requires all public bodies to coordinate their policies and operations so as to maintain the good status of water bodies which are currently unpolluted and bring polluted water bodies up to good status by 2027.

WASTEWATER

Waste water in Dublin City is currently treated in Ringsend Wastewater Treatment Works which discharges into Dublin Bay. The treated waters are treated to a Tertiary standard, which is in compliance with the Urban Wastewater Treatment Directive. The quality of the discharged waters is within the requirements of the Urban Waste Water Treatment Directive.

The Greater Dublin Drainage Scheme will represent a significant wastewater infrastructure development for the Greater Dublin Regional area which will allow for an underground orbital sewer and two pumping stations, a new wastewater treatment plan at Clonshaugh (in Dublin City) and an outfall pipe located 6km out to sea from Baldoyle Bay. This project is subject to technical studies with a view to submitting a planning application accompanied by an Environmental Impact Statement (EIS) and Natura Impact Statement (NIS) in 2018.

WATER

It is anticipated that Dublin will need a new major water source by 2025, based on projection of growth in the Greater Dublin Area. Irish Water is currently planning the development of a new major water source for the East and Midlands which will include supplying projected demand in the GDA water supply area. Irish Water is also currently implementing a major water conservation programme in order to maximise the availability of treated water from current sources.

4.9.3 WASTE MANAGEMENT

The Regional Waste Management Plan 2015-2024 for the Eastern-Midlands Region encompasses the local authorities: Dublin City, Dún Laoghaire- Rathdown, Fingal, Kildare, Louth, Laois, Longford, Meath, Offaly, Westmeath and Wicklow. The regional plan provides the framework for waste management for the next six years and sets out a range of policies and actions in order to meet the specified mandatory and performance targets.

The Waste Framework Directive (WFD) has incorporated previous separate directives that addressed waste oils and hazardous waste. Principles in relation to waste prevention, recycling, waste processing and the polluter pays principle are included within this Directive.

In 2014 the EC adopted a communication promoting the Circular Economy. The circular economy considers waste as a resource which in turn can be recirculated into systems that focus on maintaining, repairing, reusing, refurbishing and recycling materials.

Denmark, Sweden, Japan, Scotland and the Netherlands[16] are currently the most advanced countries in terms of embedding the circular economy into their waste management system. Key elements of the communication include:

[16] http://circulatenews.org/2015/04/an-introduction-to-circular-economy-in-scandinavia-sweden-and-denmark-leading-the-race-to-circularity/

- Increase recycling and preparing for municipal waste to 70% by 2030
- Increase recycling and preparing for reuse of packaging waste to 80% by 2030
- An aspiration to eliminate landfill by 2030
- Member states to be responsible for ensuring the separate collection of bio waste by 2025.
- Reduction of food waste by at least 30% by 2025.

Dublin City Council will be committing a certain amount of waste to the thermal treatment plant in Ringsend within Dublin City Councils administrative area, the construction and use of which forms a part of the waste management strategy for the Greater Dublin Area.

4.9.4 Key Issues: Material Assets

Extreme weather events pose significant risks to critical assets such as electricity infrastructure. Projected increases in temperature, wind speeds, cold snaps and rainfall will also put a stress on the built environment, particularly on critical infrastructure (such as electricity and communication networks) and residential developments (with the most vulnerable populations being particularly at risk).

Increases in wind speeds, cold snaps and rainfall will put a stress on transport networks, which may lead to disruption of transport services during extreme events

Flooding also puts groundwater supplies at risk, as these can be contaminated due to the high infiltration of flood water.

Key issues to consider for material assets include:

- Encouraging sustainable use of resources
- Reducing reliance on private transport
- Workable alternatives to private transport and future public transport services and modal shift
- Projected increases in temperature, heat waves and droughts may increase the risk of fires in landfill sites and can also increase the prevalence of vermin and odour.
- Energy – both energy efficiency in buildings and transport and alternative, renewable sources of energy.

FIGURE 17 EXISTING TRANSPORT PROVISION IN DUBLIN CITY

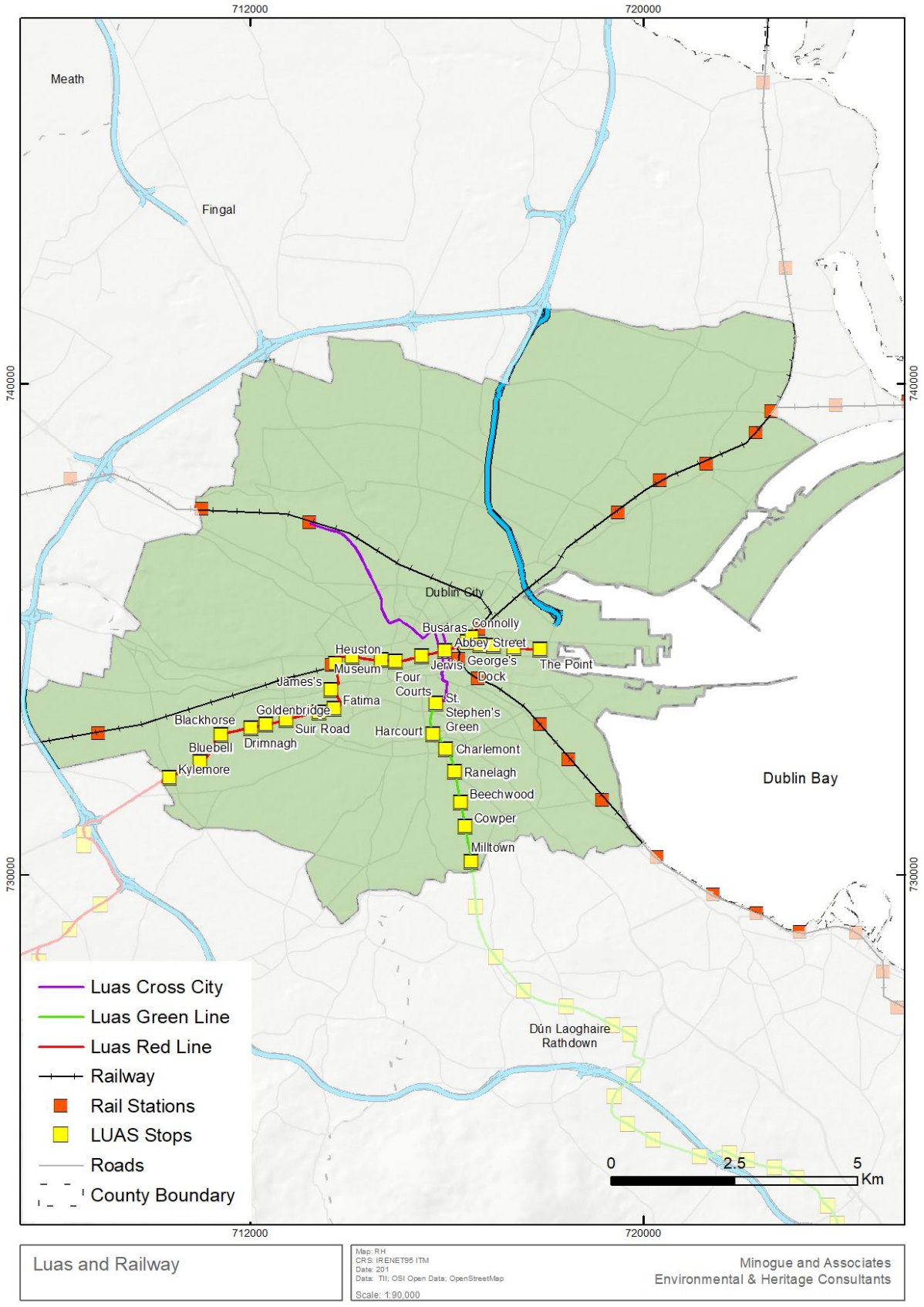
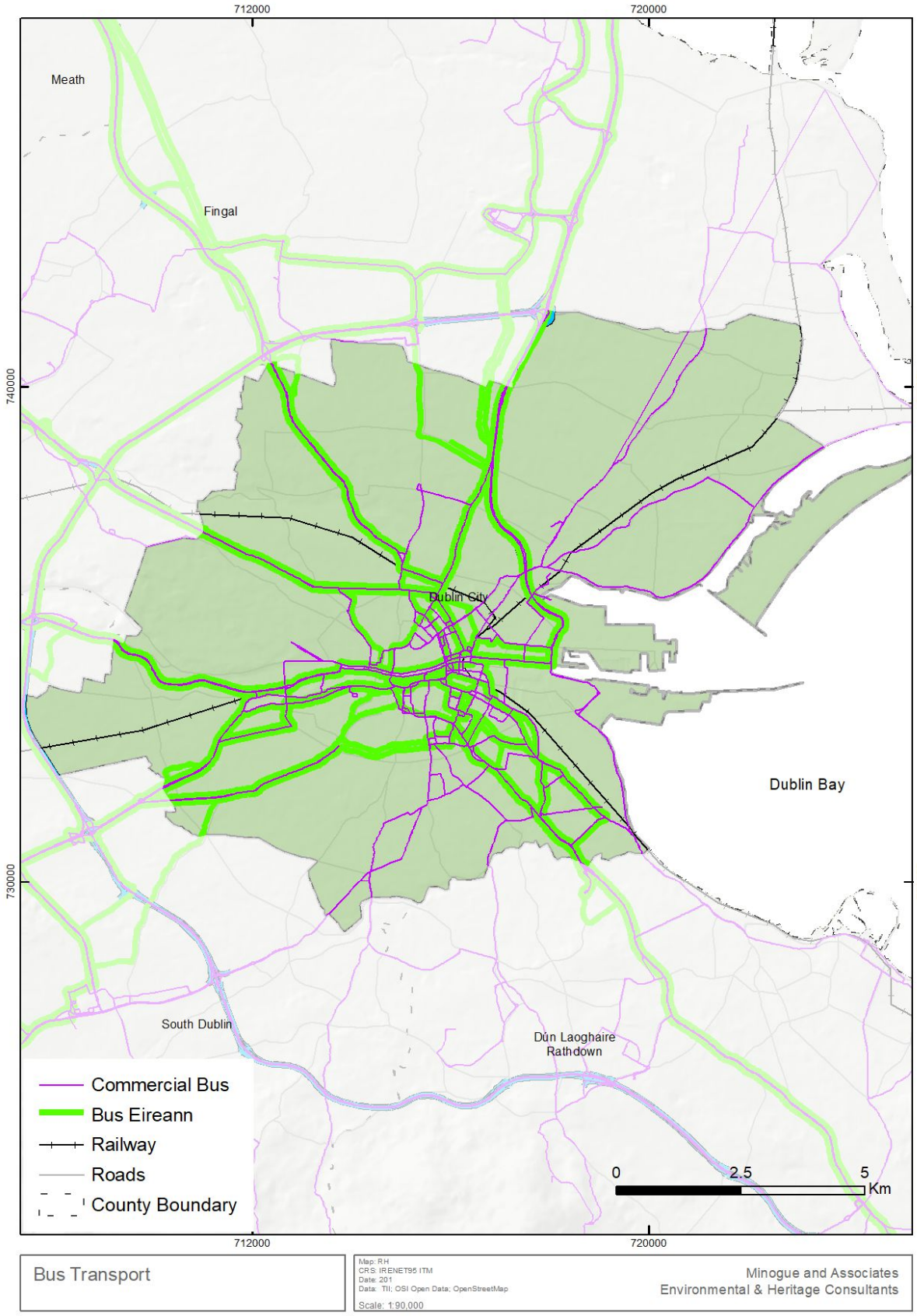


FIGURE 18 CURRENT BUS PROVISION DUBLIN CITY

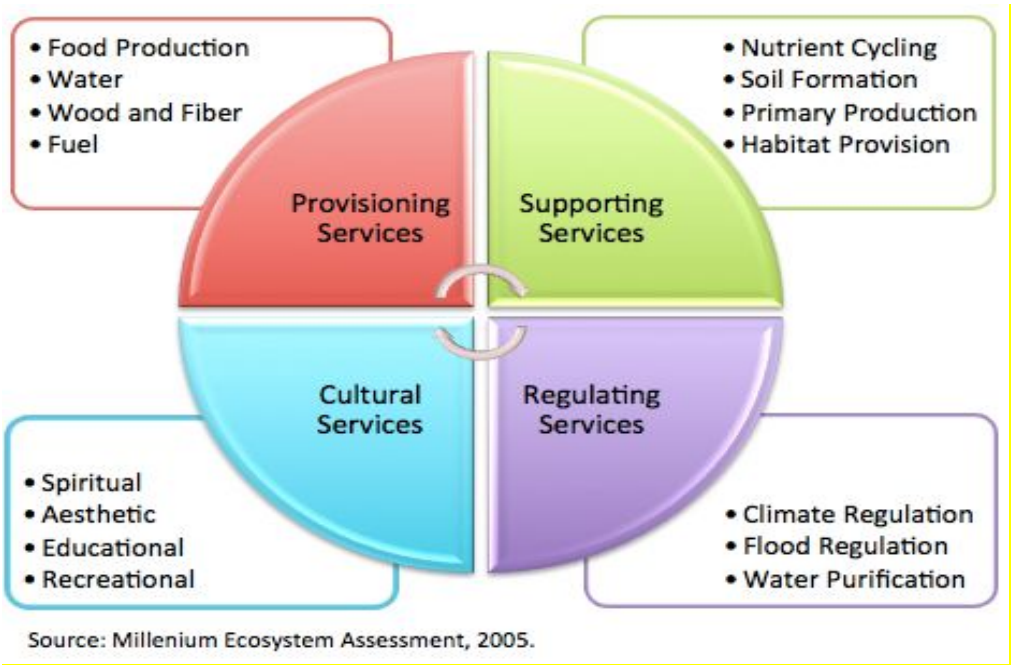


4.10 Inter-relationships

4.10.1 Ecosystem Services

Awareness about the roles and functions of ecosystems has increased in recent years and it can be a useful means to highlight their importance and value services to society. The Economics of Ecosystem Services and Biodiversity (TEEB) study defines ecosystem services as: '*the benefits people receive from ecosystems'*. Humans are ultimately dependant on the natural environment and ecosystem services highlight how these systems provide and interact to create the essential components for human well- being. Four key services are identified for ecosystems and are shown in the following **Figure 21**.

FIGURE 19 ECOSYSTEM SERVICES.



Source: Millenium Ecosystem Assessment, 2005.

4.10.2 National Ecosystem and Ecosystem Services Mapping Pilot (NPWS)

The National Parks and Wildlife Service (NPWS) commissioned a short project for a National Ecosystem and Ecosystem Services mapping pilot for a suite of prioritised services based on available data. The project completed in 2016.

In addition to highlighting the importance and values of biodiversity and ecosystems, the project set out to initiate discussion on how ecosystem services assessments can be integrated into multi-sectoral decision making processes in Ireland. The deliverables also contribute to meeting a number of Ireland's national, EU and UN obligations. The project utilised available information and built upon existing approaches and tools including the MAES conceptual framework and the JNCC Spatial Framework approach and CICES (Common International Classification of Ecosystem Services) as well as initiatives and activities in Ireland. The following maps show an initial assessment from this project highlighting the ecosystems services provided in the 4 Dublin Local Authorities. These are briefly discussed below in the context of the relevant CCAP.

FIGURE 20 ECOSYSTEM SERVICES –WATER REGULATION OF FLOWS

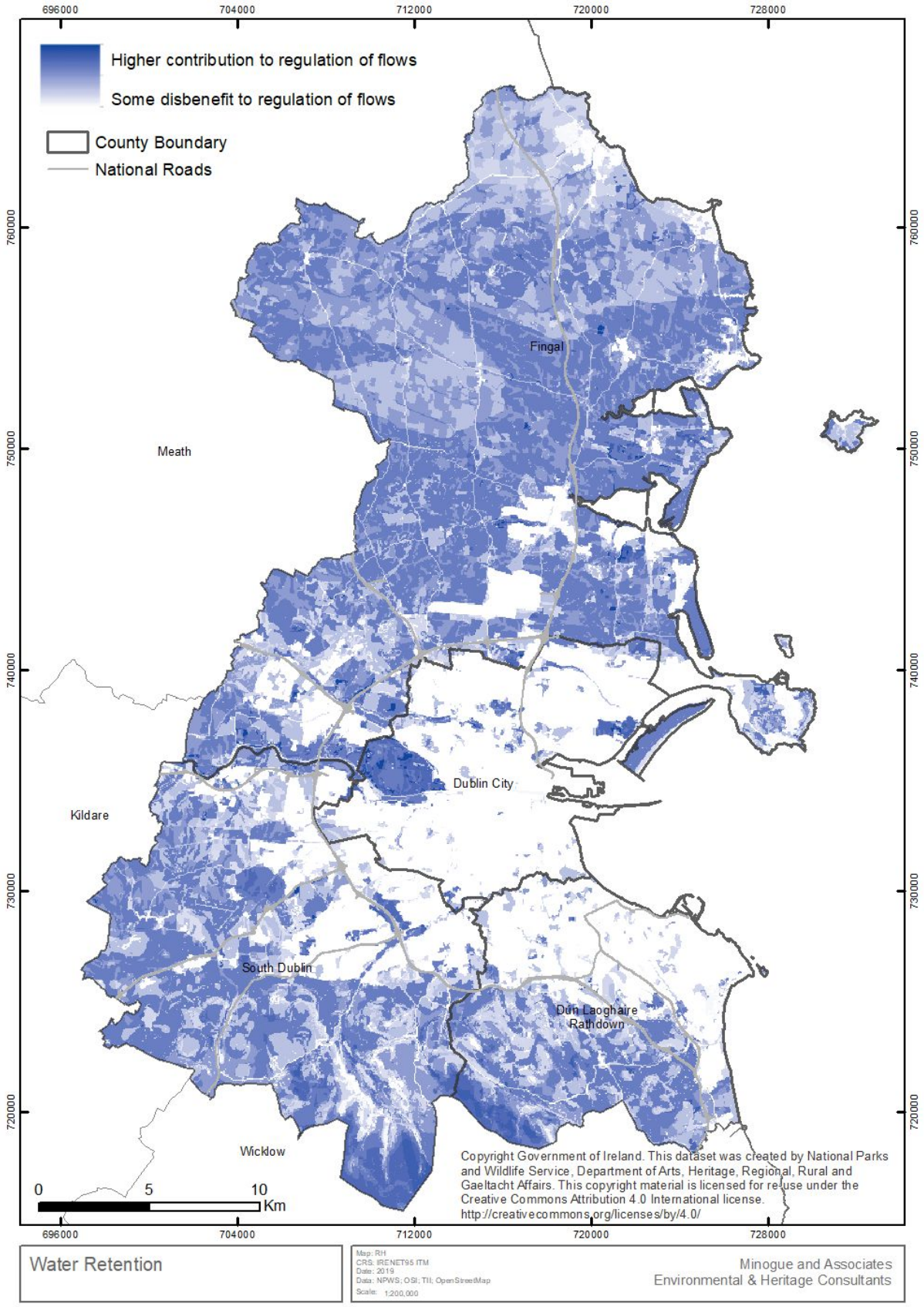


FIGURE 21 ECOSYSTEM SERVICES –WATER FILTRATION

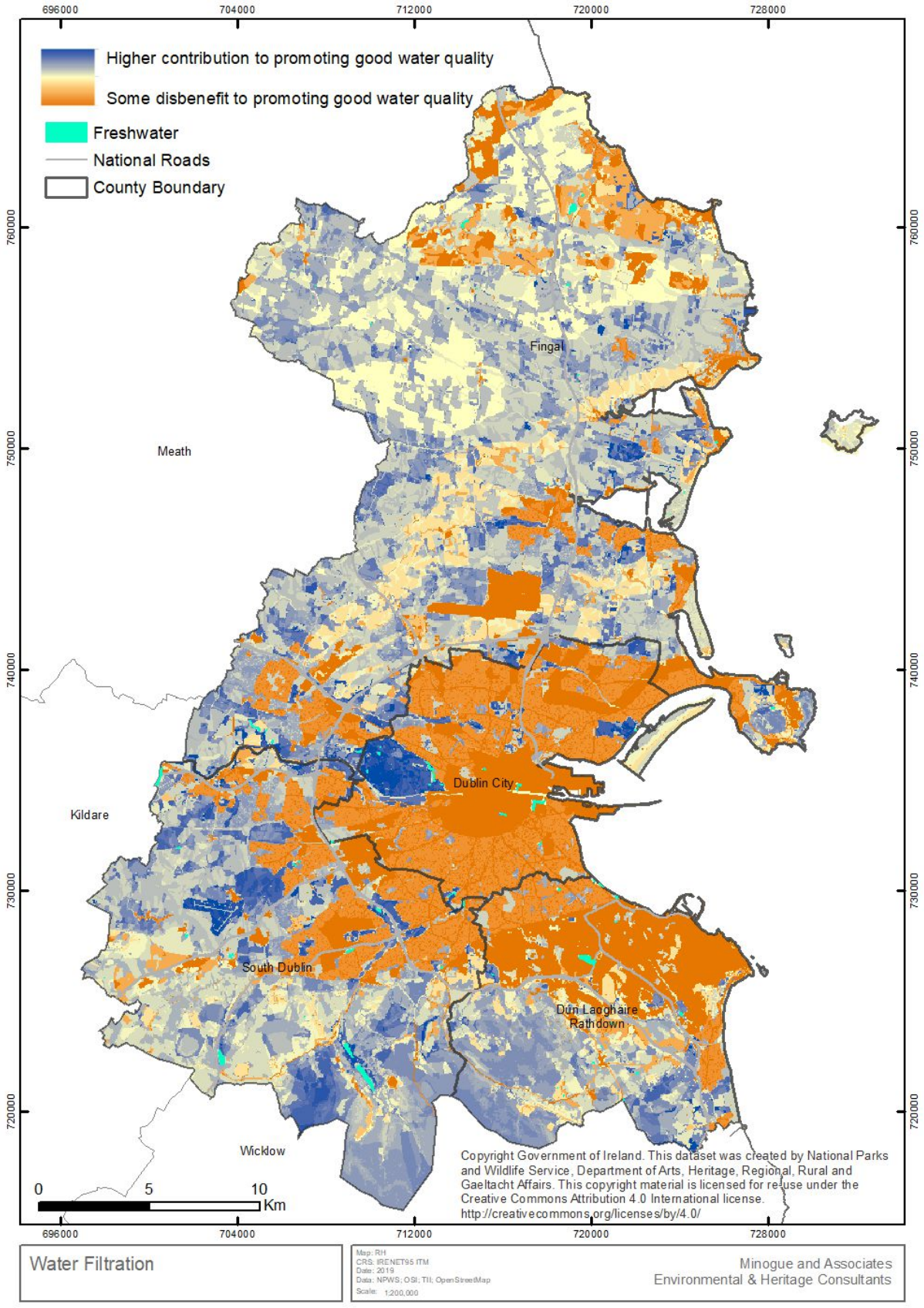
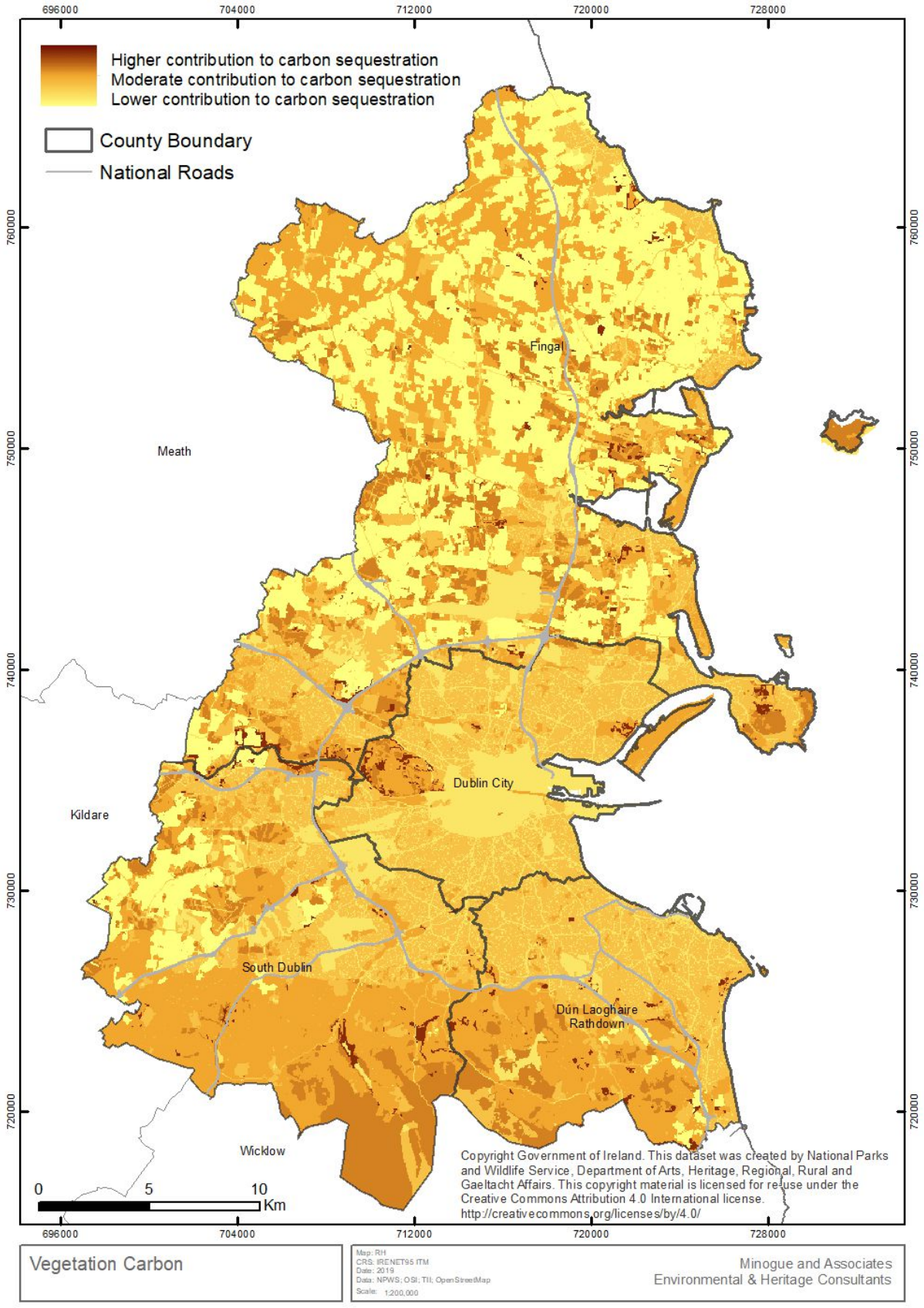


FIGURE 22 ECOSYSTEM SERVICES- CARBON SEQUESTRATION



In the context of Dublin City, the above assessment demonstrates the importance of the surrounding areas in terms of water storage, filtration and carbon sequestration. The large open space/parkland at Phoenix Park and Bull Island highlight the importance of these areas within the context of providing ecosystem services to Dublin City.

4.10.1 Environmental Sensitivity.

In accordance with the SEA Directive, the interrelationship between the environmental parameters above must be taken into account. Although all such parameters may be considered interrelated and may impact on each other at some level environmental

The Figure below shows the overall environmental sensitivity for the plan area and sphere of influence, and follows the same approach (i.e.: ranking of environmental parameters) as that used in the Dublin City CDP 2016-2022 SEA process.

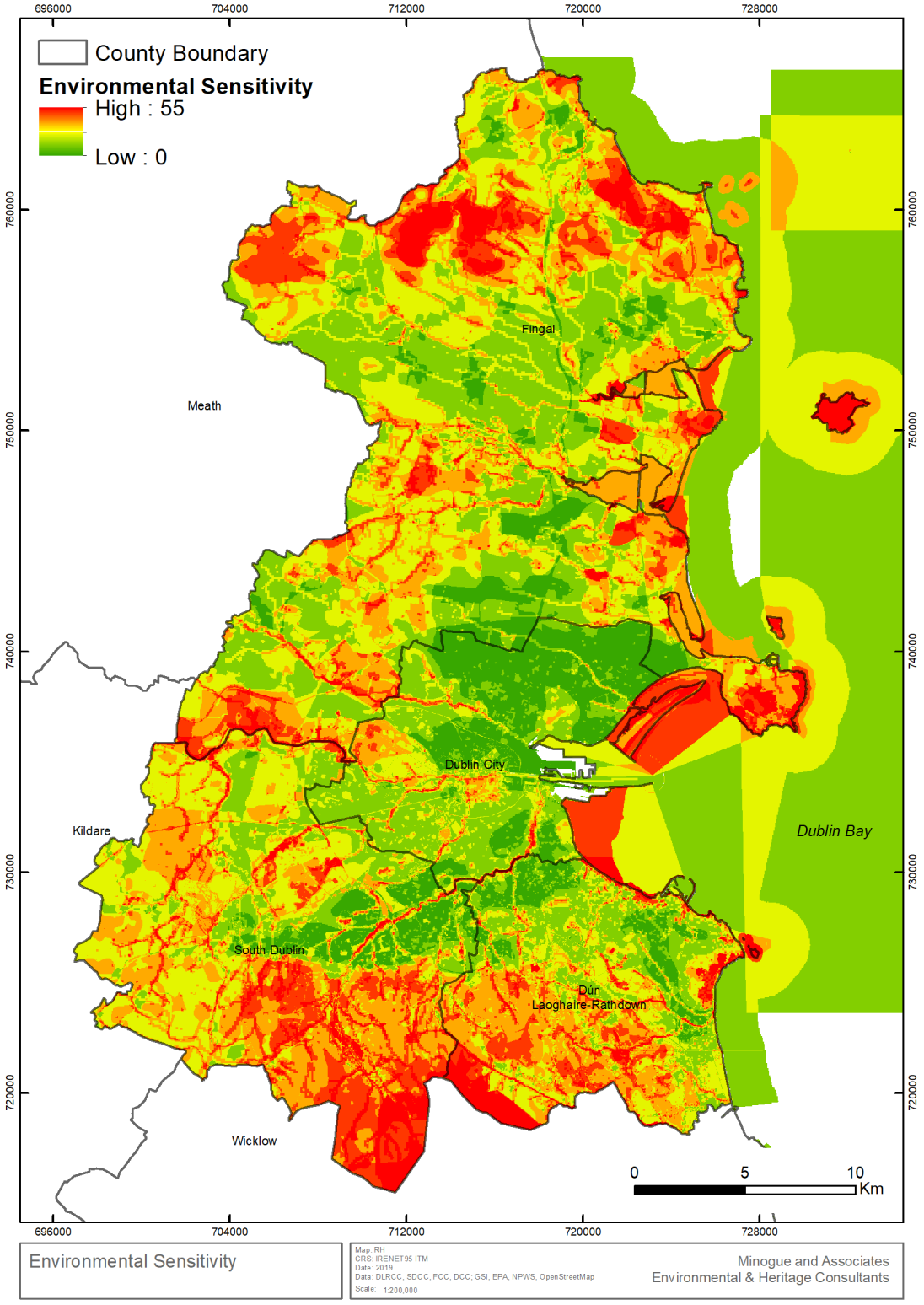
In order to show consistency between the four local authorities in terms of overall environmental sensitivity, the following parameters were utilised:

Every Parameter value = 5 (except Groundwater Vulnerability)

<table>
<tr><td>All Dublin Local Authorities</td><td colspan="3">SAC, SPA, NHA, pNHA
NIAH, SMR
ACA (SDCC; FCC; DLR) / Arch zone (DCC)
Rivers / Lakes
Nutrient Sensitive Waters
Corine – pasture/non-irrigated/peat/natural grassland categories
Ancient Woodland Survey (NPWS)
RPA drinking water rivers
RPA drinking SWB
RPA bathing SWB
Sites and Monuments
GW Vulnerability</td></tr>
<tr><td>Fingal County Council</td><td>Highly Sensitive Landscapes
Nature Development Areas</td><td>South Dublin CC</td><td>SDCC- Grean Areas (Urban Atlas) -
SDCC - AREAS_OF_ARCHELOGICAL_POTENTIAL
SDCC – Views
SDCC – Hedgerows
SDCC- Parks
SDCC – Trees in Dodder Valley</td></tr>
<tr><td>FCC, SDCC, DLR</td><td>Record Protected Structure</td><td>DLR</td><td>Conservation Area; Ecological Networks, Coastal Habitats</td></tr>
</table>

By mapping key environmental layers (GIS) to produce an environmental sensitivities map, it provides a visual impression which can assist in identifying which areas within the Plan area experience the highest concentration of environmental sensitivities and consequently the areas potentially most vulnerable to potential environmental impacts from development. This can be a useful guide when considering the strategic options in relation to the plan during the early stages in the plan making process, and identifying areas that are of greater or lesser vulnerability. **Figure 25** shows the environmental sensitivity map for the four Dublin Local Authorities.

FIGURE 23 Environmental sensitivity mapping of the four Dublin Local Authorities



4.11 Evolution of the environmental baseline in the absence of the CCAP

The SEA legislation requires that consideration is given to the likely evolution of the current baseline where implementation of the CCAP 2019-2024 does not take place. In the absence of the CCAP the environment would evolve under the requirements of the Dublin City Development Plan 2016- 2022.

Overall, this Climate Change Action Plan will be monitored and updated on an annual basis, with a review and revision every five years. Whilst the Dublin City CDP 2016-2022 will remain the primary landuse framework for the county, in the absence of the CCAP, the detailed actions accompanied by targets and indicators will not allow for the annual measuring of progress in this area. This presents a lost opportunity to implement changes at local authority, and community level across the county.

Key actions relating to nature based solutions which offer a suite of positive environmental effects would not be implemented with subsequent opportunities lost to green up infrastructure, promote food security and enhance tree planting. Other actions such as wetlands provision in public parks would be omitted.

At county level, the local authority would be less likely to contribute to continue to the reduction in carbon emissions associated with their fleet, lighting and buildings.

Promoting regional or inter county actions relating to public transport, walking and cycling may be less effective in the absence of this action plan.

4.12 Environmental issues in neighbouring areas.

Whilst the CCAP is prepared for Dublin City, the regional approach for the four DLAs is a key element of the four CCAPs; therefore a summary of key environmental issues identified for Climate Change in the SEA ER of neighbouring local authority areas is presented below in Table 4. It is accepted that many of the climate change issues are cross cutting and give rise to a variety of effects and issues on SEA parameters, in particular, biodiversity, flora and fauna, water resources, soil, landscape, material assets and population and human health.

TABLE 6KEY CLIMATE CHANGE ISSUES IDENTIFIED IN SEA ER OF NEIGHBOURING LOCAL AUTHORITY COUNTY DEVELOPMENT PLANS

SEA Topic	Existing Environmental Issues Dublin City Council
Fingal County Development Plan 2017-2023	Some of the likely potential impacts of climate change for Fingal have been identified as follows: Increased likelihood and magnitude of precipitation levels and flooding events Disruption to urban infrastructure due to flooding Increased sea levels and loss of coastal land Potential residential and commercial water shortages, and Increased vulnerability for at risk sections of society due to changing demographic and hazards Towns along the coast will become increasingly vulnerable to rises in sea levels, coastal erosion and coastal squeeze. More intense storm events are also likely outcomes of climate change.

South Dublin County Development Plan 2016-2022	The two single greatest issues facing South Dublin in relation to climate change relate to increased amounts of greenhouse gas emissions from Transport movements, and the danger posed by flooding events, which will occur as a result of the former. Solutions require reductions in unsustainable transport movements, and the amelioration of potential flooding events. The manner in which transport movements can be reduced is tied into the provision of high quality public transport between key locations in South Dublin and into Dublin City. At the neighbourhood level, the design and incorporation of walkable and cycle friendly urban developments is to be accommodated. The preservation, or creation of walking links along the most direct routes within existing urban areas, specifically to shop, workplaces, schools and public transport links, must be given high priority, otherwise trips by car will continue to grow. Reducing car movement at the neighbourhood level through increasing ease of pedestrian movement must be the foundation stone for an overall decrease in emissions. The potential for increased flooding in the County, particularly in proximity to the Dodder River. Accommodation of retention areas for flood waters must be considered at this stage, prior to the onset of major flooding events. In addition to maintaining green spaces and existing flood plains free from development, the requirements of the Dodder River CDFRAMS (and the Liffey CFRAMS) must be taken into account.
Dun Laoghaire Rathdown County Development Plan 2016-2022	Legislative objectives governing air and climatic factors in Dún Laoghaire-Rathdown were not identified as being conflicted with.
Kildare County Development Plan 2017 - 2023	Legislative objectives governing air and climatic factors in County Kildare were not identified as being conflicted with.
Meath County Development Plan 2013-2019	Land use changes can and will have far reaching implications for climate change that could include sweeping changes to commuter patterns with the building of more one-off houses in rural areas (also influenced by Government policy such as the Guidelines for Sustainable Rural Housing) and the resultant increase in GHGs, SO2, NOx, VOC and other pollutant emissions.

5 STRATEGIC ENVIRONMENTAL OBJECTIVES

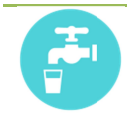
5.1 INTRODUCTION

The purpose of the SEA Objectives is to ensure that the assessment process is transparent and robust and that the CCAP considers and addresses potential environmental effects. SEA Objectives have been set for each of the ten environmental topics identified at the Scoping Stage of the SEA process.

These objectives are derived from the principles identified through the plan, policy and programme review and align where possible with the SEOs developed for the Dublin City Development Plan 2016-2022. Where they differ from the CDP 2016-2022 objectives, the text is shown in italic bold font. The results of this are summarised in a table, called an evaluation matrix (See Chapter Seven and Annex A of this SEA ER).

TABLE 7 STRATEGIC ENVIRONMENTAL OBJECTIVES

SEA Topic	Environmental Protection Objective
Biodiversity Flora and Fauna	To protect and where appropriate enhance the diversity of habitats, species, ecosystems and geological features.
Population and human health	To create a sustainable compact city and a high quality healthy safe environment in which to live, work and/or visit.
Water	To protect and where necessary improve the quality and management of watercourses and groundwater, in compliance with the requirements of all water and habitat based legislation including the river Basin. Management Plan of the Eastern River Basin District.
Air Quality and Climate	Minimise emissions of pollutants to air associated with development activities and maintain acoustic quality.
	Contribute to the mitigation of/and adaptation to climate change and implement requirements of Strategic Flood Risk assessment
Soil and Geology	See Landscape Objective
Material Assets	

	To make best use of Dublin city's infrastructure and material assets and to promote the sustainable development of new infrastructure to meet the needs of the city's population.
Cultural Heritage 	To protect and where appropriate enhance the character, diversity and qualities of Dublin city's cultural, including architectural and archaeological, heritage.
Landscape 	To protect and where appropriate enhance the character, diversity and special qualities of Dublin city's landscapes and soils.
	***Interrelationships*** ***Maintain and improve the health of people, ecosystems and natural processes*** ***Actively seek to integrate opportunities for environmental enhancement during adaptation to climate change***

6 CONSIDERATION OF ALTERNATIVES

6.1 INTRODUCTION

One of the critical roles of the SEA is to facilitate an evaluation of the likely environmental consequences of a range of alternative development scenarios, in this case the Dublin City CCAP 2019-2024. These alternative development scenarios should meet the following considerations:

- Take into account the geographical scope, hierarchy and objectives of the plan –be realistic
- Be based on socio-economic and environmental evidence – be reasonable
- Be capable of being delivered within the plan timeframe and resources –be implementable
- Be technically and institutionally feasible – be viable

In developing, refining and assessing the alternatives for the draft CCAP, the toolkit included in Developing and Assessing Alternatives in Strategic Environmental Assessment Good Practice Guidance (EPA 2015) was utilised.

In addition to the above, the CCAP will function within the policy hierarchy established by national, regional and county strategic plans, as well as relevant legislation.

This chapter presents the approach to considering and assessing the alternatives for the CCAP. Section 6.2 presents the alternative scenarios. Section 6.3 presents the evaluation of the alternatives for potential environmental effects. This in turn informed the selection of a preferred alternative for the CCAP which is presented in Section 6.4.

6.2 ALTERNATIVES CONSIDERED

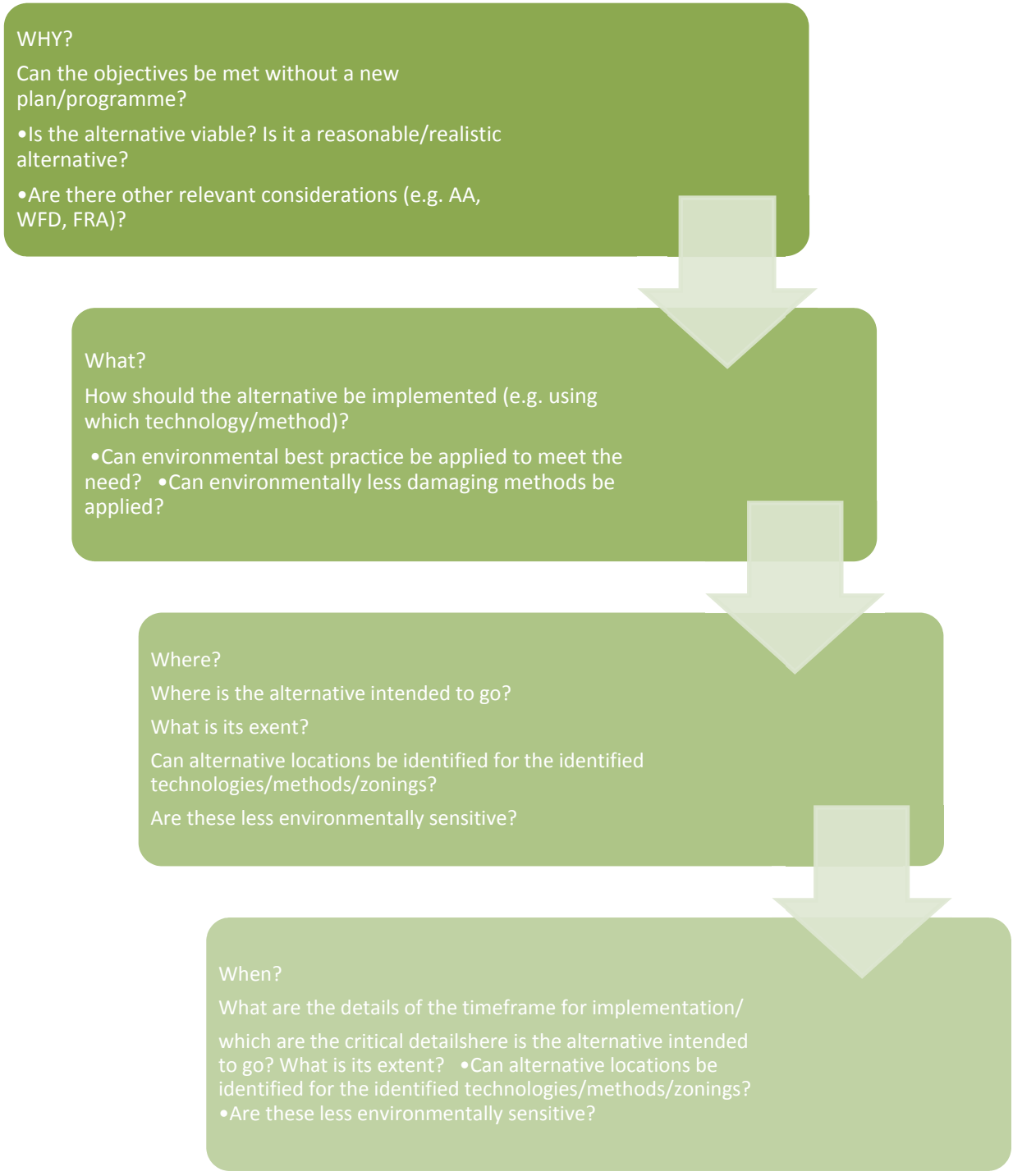
In a *Strategy towards Climate Change Actions Plans for Dublin 2017*, seven focus areas were identified as having the greatest potential to help the Dublin LAs move towards a zero-carbon society and adapt to the effects of climate change. These focus areas were as follows:

- Water, Waste, Planning, Transport, Energy, Ecosystems and Biodiversity and Citizen Engagement.

The focus areas can have predominately either mitigation or adaptation solutions, or both. For example, the Energy focus area mainly concerns mitigation (i.e. reducing the use of fossil fuels and their associated CO2 emissions), while Water largely focuses on adapting to changes that are occurring or will occur in the near future due to climate change. Meanwhile, the Citizen & Stakeholder Engagement focus area concerns both mitigation and adaptation.

The aim of the CCAP is to work with the other Dublin local authorities in a co-ordinated manner to achieve the actions identified as being capable of implementing over a Five Year Period whilst also contributing to both mitigation and adapting to climate change. In

considering Alternative Scenarios for the CCAP, the following questions were used to help frame the Consideration of Alternatives[17]:



Therefore the Alternatives considered are as follows:

[17] Adapted from Figure 4.3 Developing and Assessing Alternatives in the Strategic Environmental Assessment Process (EPA, 2015).

TABLE 8 ALTERNATIVES CONSIDERED

	Why **Can the objectives be met without a new plan/programme?** **•Is the alternative viable? Is it a reasonable/realistic alternative?** **•Are there other relevant considerations (e.g. AA, WFD, and FRA)?**	**What** **What?** **How should the alternative be implemented (e.g. using which technology/method)?** **•Can environmental best practice be applied to meet the need? •Can environmentally less damaging methods be applied?**	**Where** **Where?** **Where is the alternative intended to go?** **What is its extent?** **Can alternative locations be identified for the identified technologies/methods/zonings?** **Are these less environmentally sensitive?**	**When** **When?** **What are the details of the timeframe for implementation/ which are the critical details here is the alternative intended to go?** **What is its extent? •Can alternative locations be identified for the identified technologies/methods/zonings?** **•Are these less environmentally sensitive?**
Alternative 1: Do-Nothing (rely CDP policies and objectives to address and adapt to climate change)	This alternative could see the do nothing scenario be continued by using the existing CDP policies and landuse zonings to continue to adapt and plan for effects on climate change.	Through using climate change policies in the CDP and providing the landuse framework for responding to climate change. Landuse activities relevant could include renewable energy, transport and flood risk management	This would include the city of Dublin	This would cover the timeframe of the current CDP upto 2022
Alternative 2: Prioritise largest greenhouse gas emission sectors – Energy and	This would require the preparation of an action plan that would concentrate on energy and transport for Fingal as a means to address and respond to climate	It would prioritise measures that would reduce energy emissions, promote renewable energy and sustainable transport projects	This would include the city of Dublin	This would likely reflect the timeframe of the CDP given its landuse implications.

	Why Can the objectives be met without a new plan/programme? •Is the alternative viable? Is it a reasonable/realistic alternative? •Are there other relevant considerations (e.g. AA, WFD, and FRA)?	What What? How should the alternative be implemented (e.g. using which technology/method)? •Can environmental best practice be applied to meet the need? •Can environmentally less damaging methods be applied?	Where Where? Where is the alternative intended to go? What is its extent? Can alternative locations be identified for the identified technologies/methods/zonings? Are these less environmentally sensitive?	When When? What are the details of the timeframe for implementation/ which are the critical details here is the alternative intended to go? What is its extent? •Can alternative locations be identified for the identified technologies/methods/zonings? •Are these less environmentally sensitive?
Transport	change			
Alternative 3: Approach the priority areas in a balanced manner to provide for both responses to climate change impacts (adaptation) and reduce greenhouse gas missions mitigation).	This is the existing CCAP. It would consider a mixture of adaptation and mitigation measures for the climate change action plan and would include citizen engagement and awareness raising throughout. It would be underpinned by a baseline assessment of greenhouse gas emissions and sectoral use in the county	This would include a suite of measures that would aim to bring co-benefits where possible and rely on nature based solutions where possible	This would be tailored to Dublin City but prepared as part of a broader regional approach to climate change	This would extend to 2024 and include a detailed monitoring regime to allow for annual reporting and monitoring of actions.

	Why	What	Where	When
	Can the objectives be met without a new plan/programme? •Is the alternative viable? Is it a reasonable/realistic alternative? •Are there other relevant considerations (e.g. AA, WFD, and FRA)?	What? How should the alternative be implemented (e.g. using which technology/method)? •Can environmental best practice be applied to meet the need? •Can environmentally less damaging methods be applied?	Where? Where is the alternative intended to go? What is its extent? Can alternative locations be identified for the identified technologies/methods/zonings? Are these less environmentally sensitive?	When? What are the details of the timeframe for implementation/ which are the critical details here is the alternative intended to go? What is its extent? •Can alternative locations be identified for the identified technologies/methods/zonings? •Are these less environmentally sensitive?

6.3 Assessment of potential effects for each alternative scenario

This section presents the assessment of potential environmental effects for each Alternative Scenario. This is undertaken by assessing each alternative against the SEOs presented in Chapter 5 of this SEA ER. It is informed by the environmental baselines as well as the policy review.

The assessment of Alternatives is categorised as follows, as many of the alternatives share similar objectives, to highlight where an alternative may generate particular positive or negative effects, a + or – is shown. :

Positive	
Neutral	
Uncertain	
Negative	

TABLE 9 ASSESSMENT OF ALTERNATIVES

Strategic Environmental Objectives	Alternative 1:Do Nothing Scenario	Alternative 2.Prioritise Energy and Transport	Alternative 3 Prioritise all main sectors and include for awareness raising
Biodiversity			
To protect and where appropriate, enhance the diversity of habitats, species, ecosystems and geological features.	Uncertain to negative	Uncertain/ negative	Positive++
Population and Human Health			
To create a sustainable compact city and a high quality safe environment in which to live, work and/or visit.	Positive	Uncertain	Positive++
Water			
To protect and where necessary improve the quality and management of watercourses and groundwater, in compliance with the requirements of all water and habitat based legislation including the river Basin. Management Plan of the Eastern River Basin District.	Positive	Positive	Positive++
Comment: Whilst all alternatives show consistency with these Water SEOs, Alternative 3 has allowed for full integration of strategic flood risk assessment and promotes nature based solutions as another means to respond to climate change thereby increasing the overall environmental performance of the option. .			
Soil and Geology and Landscape			
To protect and where appropriate enhance the character, diversity and special qualities of Dublin city's landscapes and soils.	Positive	Neutral	Positive++
Material Assets			
To make best use of Dublin city's infrastructure and material assets and to promote the sustainable development of new infrastructure to meet the	Positive	Positive	Positive

Strategic Environmental Objectives	Alternative 1:Do Nothing Scenario	Alternative 2.Prioritise Energy and Transport	Alternative 3 Prioritise all main sectors and include for awareness raising
needs of the city's population			
Climate and Air Quality			
Minimise emissions of pollutants to air associated with development activities and maintain acoustic quality.	Positive	Positive	Positive++
Contribute to the mitigation of/and adaptation to climate change and implement requirements of Strategic Flood Risk assessment.	Uncertain	Neutral	Positive ++l
Cultural Heritage			
To protect and where appropriate enhance the character, diversity and qualities of Dublin city's cultural, including architectural and archaeological, heritage.	Positive	Uncertain	Positive
Landscape			
To protect and where appropriate enhance the character, diversity and special qualities of Dublin city's landscapes and soils.	Neutral	uncertain	Positive++

6.5 Preferred Alternative

In terms of all SEOs, Alternative 3 is identified as creating most positive interactions as it provides greater environmental performance overall and also allows for a greater environmental gains, than may be achieved through Alternatives 2 and 1. In addition, the mulit faceted approach contributes to greater co-benefits by providing for a wider range of environmental effects particularly around nature based solutions and resource management. The inclusion of measures for citizen engagement and awareness raising through the CCAP option is also positive for a number of SEOs.

7 Assessment of Significant Environmental Effects

7.1 Introduction

The purpose of this section of the Environmental Report is to predict and evaluate as far as possible the environmental effects of the CCAP 2019-2024.

SEA is an iterative process and the CCAP has taken consideration of environmental issues raised during the SEA process to date. These issues have been incorporated into the CCAP and the principal purpose of this chapter is to discuss the evaluation of these. The discussion of likely impacts is grouped around each of the following environmental parameters as described in Chapter Four.

- Population & Human Health
- Biodiversity, Flora & Fauna
- Water Resources including flooding
- Soil & Geology
- Climatic Factors and Climate change
- Cultural Assets
- Material Assets
- Landscape
- In-combination and cumulative effects.

7.2 Approach to Assessment

Having established the environmental baseline and the key environmental sensitivities for the Plan area in Chapter 4, and the Strategic Environmental Objectives in Chapter 5, an assessment for any potential environmental effects from implementing the CCAP can be undertaken.

An assessment of cumulative and in-combination effects is also presented in the concluding section of this chapter.

7.2.1 Population and Human Health-Significant effects

Land use planning impacts on the everyday lives of people and can either hinder or help promote healthy sustainable environments and communities. For example the provision of safe walking routes and cycle-ways, parks, playgrounds, safe routes to school, public transport facilities, etc. result in direct and indirect health benefits and allow for healthier transportation choices to be made by communities above private motor car.

Many of the actions identified in the CCAP give rise to long term positive effects on population and human health both by responding and adapting to the impacts of climate change, and also reducing greenhouse gas emissions through a series of measures.

Reflecting the opportunity for co-benefits of the CCAP, measures around energy efficiency and district heating opportunities can help address fuel poverty in relation to vulnerable individuals as well as the chance to reuse energy from within the local area, for example Energy: *Action 2 Requirement for all new developments to be district heating-enabled in Poolbeg West, North Lotts and Grand Canal SDZs.*

Actions 12 (Fabric upgrade programme) and *16 (PV panels)* provides positive, long term effects both in relation to resource management (by reusing existing buildings and greenhouse gas savings

through avoiding new build particularly of concrete sourced products), but it also helps to address fuel poverty particularly in housing stock that may require upgrading to achieve greater energy efficiency, reducing fuel bills and overall enhancing the comfort of these dwellings.

Reflecting key objectives in the Dublin CDP 2016-2022 the CCAP will support and encourage a modal shift in transport by expanding the walking and cycling network, encouraging and promoting greater engagement and awareness raising in relation to walking and cycling and promoting behavioural change; for example see the following *Transport Actions 16 to 19 Pedestrian zones, Action 26 Identify and promote use of new routes on Hike It! Bike It! Like It! platform* and *27 Develop cycle network strategy,* in addition to public realm and planning measures.

All the measures included in the Nature Based Solutions and a large number of the Flood Resilient measures are identified as generating long term positive effects on this SEO.

The measures particularly in Nature Based Solutions provide for multiple positive effects via tree planting, woodland strategy, SUDs, and wetlands, which can provide a range of ecosystem services including water purification, carbon storage, and assist in absorption of emissions associated with transport such as Particulate matter and providing noise buffers, these create positive effects on population and human health (see for example *Action 12 Identify areas for integrated constructed wetlands, Action 10 Implement Dublin Bay Biosphere work programme, 31 Develop urban woodland strategy.*

By implementing measures around flood management and where measures such as wetlands and flood attenuation ponds are created, these respond to potential flood risk events and therefore give rise to positive effects on these SEOs.

Mitigation measures are recommended in relation to preparation of a Coastal Zone Management plan to include consideration of cultural heritage which provides consistency with both population and cultural heritage SEOs.

7.2.2 Biodiversity, Flora and Fauna-Significant Effects

The promotion of a nature based measures and resource management in particular along with blue and green infrastructure actions all strengthen overall protection of biodiversity resources and the Biodiversity SEOS.

Mapping trees in the county (Nature Based Solutions Action 14), Collect data to inform preparation of a list of habitats and species in Dublin city vulnerable to climate change (Action 7)), as well as Action 1 Regional working group on nature based solutions and joint action plans to protect native habitats and species across all 4 DLS (Action 2) are examples of actions that are long term positive and consistent with these SEOs.

A number of these Transport Actions are recommended for mitigation either due to the potential in the absence of mitigation on conservation management objectives of European Sites (Actions 45 Sustainable Transport hubs –various locations); however it is considered the existing environmental protection measures in the DCC CDP2016-2022 should address these potential effects appropriately.

Walking and cycling actions, if they were to take place on or near sensitive habitats or species vulnerable to disturbance

would give rise to adverse effects. However the existing environmental protection provisions in the CDP will apply and provide sufficient mitigation measures.

Indirect and cumulative positive impacts are identified for biodiversity in relation to actions around Resource Management such as reducing illegal dumping.

Nature based solutions identified as particularly positive include Action 8 Develop Green Infrastructure Strategy for the Region. Citizen engagement actions include Action 33 Identify sites suitable for community gardens for local food production are further such examples.

7.2.3 Water - Significant Effects

Potential effects on water resources (and frequently biodiversity) in the absence of mitigation include:

- Surface water runoff from impermeable surfaces leading to reduced water quality in groundwater springs or surface waters affecting qualifying habitats and species downstream(impacts can range from short to long term);
- Changes in the flow rate of watercourses arising from an increased footprint of impermeable surfaces within the Plan area - increasing the extent of impermeable surfaces will result in a decrease in infiltration and an increase in runoff;
- Generally, land use practices can result in water quality impacts and whilst surface water impacts may be identified quickly, impacts to groundwater can take much longer to ascertain due to the slow recharge rate of this water resource;
- Water quality impacts can also have human health impacts in the case where bacterial or chemical contamination arises.

The Dublin City CDP 2016-2022 already includes a range of provisions and measures to address and minimise the above effects, including measures around green infrastructure, flood risk management and development control.

The CCAP however further enhances and strengthens these through the flood resilience actions and nature based solutions in particular. Additional tree planting and a focus on riparian habitat (Actions 3 *Establish a cross-departmental Trees and SUDS Working Group to promote and pilot water sensitive urban design incorporating urban tree planting* and 35 *Study impacts and benefits of increased buffer distances to watercourses*) provide for positive effects as they reduce soil run off and allow for water attenuation and filtration. Again this provides for longer, positive effects associated with linear habitat creation and ecological connectivity.

Measures around SUDs, such as Action 36 (retrofitting of SUDs) in the Flood Resilience theme are particularly positive, creating long term direct positive effects on water resources, as well as soil and biodiversity, landscape and population as well as Action *12 Identify areas for integrated constructed wetlands.*

An additional mitigation measures is recommended for the Flood Resilience to provide consistency in awareness raising and natural flood management measures across the DLAs. A mitigation measure is also recommended as an overarching

measure for flood defence actions -again to promote nature based solutions.

7.2.4 Soil and Geology - Significant Effects

Soil quality and function may be enhanced through particular measures associated with flood resilience, nature based solutions and resource management in particular.

Awareness raising around illegal dumping (Action 12) and Action 19 leaf composting can generate positive effects on soil through enhancement of the resource and a more sustainable approach to enriching soil. Action 38 *Prepare an analysis of soil sealing in Dublin City to determine levels of permeability* is particularly important given the largely urban character of the city's soils and its functions in terms of carbon sequestration and water attenuation, as well as its contribution to biodiversity.

A number of the measures relating to flood resilience including recognition of flood plains and production of Regional Flood Plain Management Guidelines (Action 5) indirectly benefit soil and geology SEOs.

7.2.5 AIR Quality and Climate

Overall the CCAP will contribute positively to climate change adaptation through the following:

- Blue and green infrastructure giving rise to increased surface water storage and potential carbon sequestration
- Focus on energy efficiency and innovation as seen through the actions identified in the Energy Theme, examples include
- Action 4 provides for an evidence based climate change chapter in the County Development Plan, both of which will allow for policy responses and in the CDP context, landuse zoning responses based on the evidence prepared.
- Other energy related measures including *Energy efficiency works in 30 Council owned and operated buildings* (Action 10) are all identified as positive in relation to this SEO.

Key measures relating to behavioural change around transport and the increase in walking/cycling and public transport measures are essential in addressing transport emissions over the lifetime of the CCAP and beyond.

Recognising the ecosystems functions of soil, water and biodiversity is a key element in the Nature Based solutions theme and is an important acknowledgement that also provides for positive effects across a number of SEOs.

The CCAP includes targets relating to 40% reduction in the councils' Greenhouse Gas Emissions by 2030 (primarily through lighting and energy measures), a 33% improvement in the councils energy efficiency by 2020. However the CCAP also acknowledges that the council's outputs are relatively minor given the wider sectoral emissions in the county and this is why many of measures relate to the council leading on climate action, promoting behavioural change, facilitating sustainable transport options, promoting increased energy efficiency and supporting nature based solutions and citizen engagement.

The preparation of a new baseline of emissions and the annual monitoring reporting of the CCAP is a critical feature that should allow review of progress on a regular basis.

7.2.6 Cultural Assets - Significant Effects

Archaeology and Built heritage features are present throughout the plan area, and in particular those archaeological or built heritage features associated with the coastline and Dublin Bay may be particularly vulnerable to climate change effects.

The concentration of built heritage features and historic settlements on the coastline increases their vulnerability to the effects of climate change.

Cultural heritage is not often considered or captured adequately in coastal zone management planning and this can give rise to adverse effects on cultural heritage, for example:

Overlooking cultural resources can result in

- loss of cultural identity associated with certain habitats;
- loss of tourism, recreational and educational opportunities;
- decline in local ecological knowledge, skills and technology pertaining to habitat management;
- and loss of opportunities for social and cultural capital[18].

Therefore it is recommended a mitigation measure be included for the Coastal Zone Management Planning actions (Action 9).

The CCAP does not directly identify cultural heritage however through public realm improvements, green infrastructure measures and nature based solutions, effects on cultural heritage features may be minimised over the CCAP.

[18] Coastal cultural heritage: A resource to be included in integrated coastal zone management SornaKhakzad[a]MarnixPieters[b]KoenraadVan Balen[c] Ocean & Coastal Management Volume 118, Part B

7.2.7 Material Assets - Significant Impacts

Many of the measures in Energy, Transport and Flood Resilience in particular provide for mitigation and adaptation with a view to minimising adverse effects of climate change on material assets, and also responding and facilitating behavioural and modal change in energy use and transport. Examples of these include the following:

- Energy: Action 1: Create an Energy Masterplan for the Dublin Region,
- Transport: Action 27 Develop and extend cycle network; Action 45 Sustainable Transport Hubs
- Flood Resilience: whilst most of the measures here mitigate and adapt to climate change, with accompanying positive effects on material assets SEOs, *Actions 16 Develop template to capture impacts, response and costs for all major climate events* and 18 are recommended for mitigation to allow for the inclusion of 'environmental externalities' in any costing exercise, as well as promotion of natural flood measures as a priority in any updated guidelines or policies.
- Actions under Resource Management are also identified as generating positive, long terms effects particularly around the circular economy, reuse and awareness raising around food waste and recycling.

7.2.8 Landscape - Significant Effects

Long term positive effects are identified for the CCAP and landscape primarily through the nature based solutions, public realm enhancement, green and blue infrastructure, increased tree planting etc.

Many of the measures in the CCAP require a landscape level response such as Regional Flood Plain management guidelines, recognition of green and blue infrastructure and corridors and this an important approach to take when responding to climate change.

Overall, positive effects identified for Landscape SEOs, as landscape change can be considerable with climate change effects in terms of changing water levels, habitat change, transport measures and adaptation measures such as flood risk management.

An increase in open space, green infrastructure, public realm and permeability would all create long term positive effects for the Landscape SEOs.

7.3 IN-COMBINATION AND CUMULATIVE SIGNIFICANT EFFECTS

This section of the Environmental Report provides an outline of the potential cumulative effects on the environment as a result of implementation of the CCAP.

Cumulative effects are referred to in a number of SEA Guidance documents and are defined in the EPA SEA Process Checklist as "*effects on the environment that result from incremental changes caused by the strategic action together with other past, present and reasonably foreseeable future actions. These effects can result from individually minor but collectively significant actions taking place over time or space*"[19] These effects can be insignificant individually but cumulatively over time and from a number of sources can result in the degradation of sensitive environmental resources. The assessment of cumulative effects is a requirement of the SEA Directive (2001/42/EC).

The 2004 Guidelines produced by the DECLG outlines that the SEA process is in a good position to address cumulative effects for which the Environmental Impact Assessment process is not equipped to deal with. Due to the strategic nature of the SEA process a forum is provided in which cumulative effects can be addressed.

The EPA Strive Report 2007-2013 on 'Integrated Biodiversity Impact Assessment' describes cumulative effects as incremental effects resulting from a combination of two or more individual effects, or from an interaction between individual effects – which may lead to a synergistic effect (i.e. greater than the sum of the individual effects), or any progressive effect likely to emerge over time.

[19] (EPA SEA Process Checklist (2011)).

7.3.1 SUMMARY OF CUMULATIVE AND IN-COMBINATION EFFECTS IDENTIFIED

Cumulatively and in combination, several of the CCAP Actions encourage a modal shift and in turn gives rise to indirect positive effects, for example by creating more physical activity in terms of travel to work and school, positively affecting air quality with accompanying benefits to both population and human health . In addition, this can create a reduction in emissions associated with Particulate Matter and Nitrogen Dioxide. This benefits both human health as well as Biodiversity, flora and fauna and surface water features.

The majority of the Flood Resilient measures are identified as being consistent and positive across all SEOs, in particular measures that promote natural based solutions such as tree planting and SUDs are all positive across all parameters and can provide multi-functional benefits in the landscape.

In combination and cumulative effects are particularly relevant to the Nature Based solutions actions which together create long term positive effects across Population, Landscape, Biodiversity, Soil and Geology, Water and Material Assets whilst responding to climate change effects.

The resource management is also a critical theme as it promotes reduction and reuse and measures around illegal dumping and leaf composting all interact to generate positive effects.

Threaded throughout the CCAP is the theme of citizen engagement and awareness raising and this is critical to both inform, educate and engage citizens in relation to responding to climate change, whilst also identifying positive measures. Many of the engagement

actions should increase public awareness and a sense of responsibility, collective and individual action in addressing and adapting to climate change. Positive in combination effects are identified for human health around modal shifts, and green infrastructure, behavioural change, tree planting and responding to flood risk.

The SEA ER of the Dublin City Development Plan 2016-2022 provided a cumulative assessment of national level plans and programmes as they relate to the CDP. These are presented overleaf and are updated to reflect any recent important plans/programmes/projects.

7.3.1 Potential cumulative effects from other plans and projects

Table 10 Potential cumulative and in combination effects

Plan	Comment	Cumulative effects
Climate Change Action Plans 2019-2024 for other Dublin Local Authorities	During the formulation of the CCAPs for the Dublin Region, a suite of common thematic actions have been prepared for each of the local authority areas The individual action plan for each Local Authority has undergone Habitats Directive Assessment and Strategic Environmental Assessment. It has been found that by implementing the mitigation policies and objectives of the relevant CDP as identified in the NIR and SEA ER, effects to the environment and European Sites are not likely to occur	Adverse cumulative effects not identified
National Planning Framework	The purpose of the NPF is to provide a focal point for spatial plans throughout the planning hierarchy. It will provide a framework for the new Regional Spatial and Economic Strategies (RSESs) by the three Regional Assemblies and the associated enhancement of the economic development focus of local authorities as per the Local Government Reform Act 2014. The NPF will co- ordinate the strategic planning of urban and rural areas in a regional development context to secure overall proper planning and development as well as co-ordination of the RSES's and city/ county development plans in addition to local economic and community plans and local area plans and other local development.	The SEA And NIR of the NPF and Draft RSES are now available. The CCAP are consistent with key objectives as shown in Section 3 of this SEA ER.
Regional Spatial & Economic Strategy (Draft)	The RSES is a strategic plan which identifies regional assets, opportunities and pressures and provides appropriate policy responses in the form of Regional Policy Objectives. At this strategic level it provides a framework for investment to better manage spatial planning and economic development throughout the Region	The SEA Scoping Report is available for the draft Strategy. No in combination effects are identified
Water Services Strategic Plan	Ireland's first integrated national plan for the delivery of water services, the Water Services Strategic Plan (WSSP) addresses six key themes and was adopted in 2015. It was subject to full SEA and AA and concluded that Overall, the assessment has identified that the implementation of the draft WSSP is likely to	No in-combination impacts were predicted as a result of implementation of the Plans

	have positive effects on the majority of the SEOs that have been used in the assessment to help characterise the environmental effects of the WSSP and no significant negative effects were identified.	
Neighbouring County Development Plans	These plans were subject to full SEA and AA and concluded that subject to full adherence and implementation of measures likely significant effects were not identified.	No in-combination impacts were predicted as a result of implementation of the Plans
River Basin District Management Plans.	The National River Basin District Management Plan is now published (2018). The second cycle River Basin Management Plan aims to build on the progress made during the first cycle with a greater emphasis on ensuring the evidence base is available and the administration supports are fully in place to support key measures. The approach to the plan development involves characterisation of Ireland's water bodies in order to develop a tailored programme of measures to allow for the protection of good status or the restoration of good status for all water bodies. The outcomes are then monitored in order to feed into further characterisation and measures setting as the cycle moves forward. The plan was subject to SEA and Appropriate Assessment.	No in-combination impacts are predicted as a result of implementation of the Plans
CFRAMS Study	The Eastern CFRAM study has been commissioned in order to meet the requirements of the Floods Directive, as well as to deliver on core components of the 2004 National Flood Policy, in the Eastern district.	No in-combination impacts are predicted as a result of implementation of the Plans.

Greater Dublin Drainage	Irish Water made a planning application for strategic infrastructure development to An Bord Pleanála for the Greater Dublin Drainage Project in June 2018. The GDD project proposes a new regional wastewater treatment facility to be located in the townland of Clonshaugh in north county Dublin, an underground orbital sewer from Blanchardstown to Clonshaugh, a new pumping station at Abbotsown, a partial diversion of the north fringe sewer, and an outfall pipeline to return the treated water to the Irish Sea. The project also includes a regional sludge treatment centre at the new GDD facility and an associated biosolids storage facility at Newtown near Kilshane Cross.	Chapter 23 of the EIAR was reviewed with a focus on the cumulative impacts, No in-combination impacts are predicted as a result of implementation of the Project
The Greater Dublin Transport Strategy 2016-2035	The Transport Strategy for the Greater Dublin Area, 2016-2035 has been prepared and published by the National Transport Authority. It sets out how transport will be developed across the region, covering Dublin, Meath, Wicklow and Kildare, over the period of the strategy and has been approved by the Minister for Transport, Tourism and Sport in accordance with the relevant legislation. Luas, heavy rail and orbital bus routes are of particular relevance to the elements of this Strategy and the CCAP.	Positive effects in relation to the prioritisation of public transport modes above private transport.

8 MITIGATION

8.1 INTRODUCTION

Section (g) of Schedule 2(B) of the SEA Regulations (Annex 1(g) of the SEA Directive) requires the Environmental Report to describe the measures envisaged to prevent, reduce and/or offset as fully as possible any significant adverse effects on the environment from implementation of the CCAP 2019-2024.. Mitigation involves ameliorating significant negative effects. Where the environmental assessment identifies significant adverse effects, consideration is given in the first instance to preventing such impacts or where this is not possible, to lessening or offsetting those effects. Mitigation measures can be generally divided into those that:

- Avoid effects;
- Reduce the magnitude or extent, probability and/or severity of effect;
- Repair effects after they have occurred, and
- Compensate for effects, by balancing out negative impacts with positive ones.

The iterative process of the preparation of the CCAP has facilitated the integration of environmental considerations into the plan. In addition, potential positive effects of implementing the CCAP have been and will be maximised and potential adverse effects have been and will be avoided, reduced or offset.

Many impacts will be more adequately identified and mitigated at masterplan, project and EIA level. In general terms, all proposals for development will be required to have due regard to environmental considerations outlined in this Environmental Report and associated assessments. Proposals for development which are deemed contrary to the environmental objectives contained in the Dublin City CDP 2016-2022 will not normally be permitted, and if permitted, will be developed with specific mitigation measures.

The following sections present the principal environmental protection measures already included in the Dublin City CDP 2016-2022 that will apply; please note this is not an exhaustive list.

8.2 Environmental Protection Measures in the Dublin CDP 2016- 2022.

The CCAP has been prepared having regard to the policies and objectives outlined within the Dublin City Development Plan 2016-2022. The particular environmental protection measures for the CDP 2016-2022 are as follows:

TABLE 11 ENVIRONMENTAL PROTECTION MEASURES IN DUBLIN CDP 2016-2022

Dublin city council development plan 2016-2022

Policies/Objectives	CLIMATE CHANGE
CC1	To prioritise measures to address climate change by way of both effective mitigation and adaptation responses in accordance with available guidance and best practice
CC2	To mitigate the impacts of climate change through the implementation of policies that reduce energy consumption, reduce energy loss/wastage, and support the supply of energy from renewable sources. It is an Objective of Dublin City Council: CCO1: To implement the 'National Climate Change Adaptation Framework' (2012) by adopting a Climate Change Action Plan for Dublin City which will assist towards meeting National and EU targets. This will be adopted by end of 2018
CCO2	To support the implementation of the forthcoming 'Climate Change Strategy for Dublin and Climate Change Action Plan for Dublin City'. It is an Objective of Dublin City Council:
CCO3	To support the implementation of the national level 'Strategy for Renewable Energy 2012– 2020' and the related National Renewable Energy Action Plan (NREAP) and National Energy Efficiency Action Plan (NEEAP).
CCO4	To support the implementation of the 'Dublin City Sustainable Energy Action Plan 2010–2020' and any replacement plan made during the term of this development plan. It is an Objective of Dublin City Council:
CCO5	To support and collaborate on initiatives aimed at achieving more sustainable energy use, particularly in relation to the residential, commercial and transport sectors.
CCO6	To promote the concept of carbon-neutral sustainable communities throughout the city and to seek to initiate and support carbon neutral demonstration projects in conjunction with local communities.
CCO7C	To actively promote and facilitate the growth of the new emerging green industries to contribute both to the reduction of

	the city's energy consumption levels and to the role of the city as a leader in environmental sustainability.
CCO8	In conjunction with Codema, to complete a comprehensive spatial energy demand analysis to help align the future energy demands of the city with sustainable energy solutions
CCO9	To encourage the production of energy from renewable sources, such as from bio-energy, solar energy, hydro energy, wave/tidal energy, geothermal, wind energy, combined heat and power (CHP), heat energy distribution such as district heating/ cooling systems, and any other renewable energy sources, subject to normal planning considerations, including in particular, the potential impact on areas of environmental sensitivity including Natura 2000 sites.
CCO10	To support renewable energy pilot projects which aim to incorporate renewable energy into schemes where feasible.
CCO11	To support and seek that the review of the national building regulations be expedited with a view to ensuring that they meet or exceed the passive house standard or equivalent, with particular regard to energy performance and other sustainability considerations, to alleviate poverty and reduce carbon reduction targets. It is the Policy of Dublin City Council:
CC3	To promote energy efficiency, energy conservation, and the increased use of renewable energy in existing and new developments.
CC4	To encourage building layout and design which maximises daylight, natural ventilation, active transport and public transport use. It is an Objective of Dublin City Council
CCO12	To ensure high standards of energy efficiency in existing and new developments in line with good architectural conservation practice and to promote energy efficiency and conservation in the design and development of all new buildings in the city, encouraging improved environmental performance of building stock.
CCO13	To support and encourage pilot schemes which promote innovative ways to incorporate energy efficiency into new developments
CCO14	To support the government's target of having 40% of electricity consumption generated from renewable energy sources by the year 2020.
CCO15	To facilitate the provision of electricity charging infrastructure for electric vehicles. It is the Policy of Dublin City Council
CC5	To address flood risk at strategic level through the process of strategic flood risk assessment, and through improvements to the city's flood defences (see appendix 11).
	WATER QUALITY
SIO6	It is an Objective of Dublin City Council To implement the European Union Water Framework Directive through the implementation of the appropriate River Basin

	Management Plan and Programme of Measures.
SI07	To take into consideration the relevant River Basin Management Plan and Programme of Measures when considering new development proposals.
SI4	To promote and maintain the achievement of at least good status in all water bodies in the city.
SI5	To promote the enhancement of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystem
SI6	To promote the protection and improvement of the aquatic environment, including through specific measures for the progressive reduction or cessation of discharges and emissions.
SI7	To promote the progressive reduction of pollution of groundwater and prevent its further pollution
SI8	To mitigate the effects of floods and droughts subject to environmental assessments
	FLOOD MANAGEMENT
SI9	To assist the Office of Public Works in developing catchment-based Flood Risk Management Plans for rivers, coastlines and estuaries in the Dublin city area and have regard to their provisions/recommendations.
SI10	To have regard to the Guidelines for Planning Authorities on the Planning System and Flood Risk Management, and Technical Appendices, November 2009, published by the Department of the Environment, Community, and Local Government as may be revised/updated when assessing planning applications and in the preparation of plans both statutory and non-statutory. It is the Policy of Dublin City Council
SI11	To put in place adequate measures to protect the integrity of the existing Flood Defence Infrastructure in Dublin City Council's ownership and identified in the Strategic Flood Risk Assessment and to ensure that the new developments do not have the effect of reducing the effectiveness or integrity of any existing or new flood defence infrastructure and that flood defence infrastructure has regard also to nature conservation, open space and amenity issues.
SI12	To implement and comply fully with the recommendations of the Strategic Flood Risk Assessment prepared as part of the Dublin City Development Plan.
SI13	That development of basements or any above-ground buildings for residential use below the estimated flood levels for Zone A or Zone B will not be permitted
SI14	To protect the Dublin City coastline from flooding as far as reasonably practicable, by implementing the recommendations of the Dublin Coastal Flood Protection Project and the Dublin Safer Project
SI15	To minimise the risk of pluvial (intense rainfall) flooding in the city as far as is reasonably practicable and not to allow any

	development which would increase this risk.
SI16	To minimise the flood risk in Dublin City from all other sources of flooding, including fluvial, reservoirs and dams and the piped water system.
SI17	To require an environmental assessment of all proposed flood protection or flood alleviation works. It is an Objective of Dublin City Council:
SI08	All development proposals shall carry out, to an appropriate level of detail, a Site-Specific Flood Risk Assessment (SSFRA) that shall demonstrate compliance with: The Planning System and Flood Risk Management, Guidelines for Planning Authorities, Department of the Environment, Community and Local Government, November 2009, as may be revised/updated and the Strategic Flood Risk Assessment (SFRA) as prepared by this Development Plan. The site-specific flood risk assessment (SSFRA) shall pay particular emphasis to residual flood risks, site-specific mitigation measures, flood-resilient design and construction, and any necessary management measures (the SFRA and Appendix B4 of the above-mentioned national guidelines refer). Attention shall be given in the site-specific flood risk assessment to building design and creating a successful interface with the public realm through good design that addresses flood concerns but also maintains appealing functional streetscapes. All potential sources of flood risk must be addressed in the SSFRA.
SIO9	Proposals which may be classed as 'minor development', for example small-scale infill, small extensions to houses or the rebuilding of houses or paving of front gardens to existing houses, most changes of use and small-scale extensions to existing commercial and industrial enterprises in Flood Zone A or B, should be assessed in accordance with the Guidelines for Planning Authorities on the Planning System and Flood Risk Management and Technical Appendices, November 2009 as may be revised/updated, with specific reference to Section 5.28 and in relation to the specific requirements of the Strategic Flood Risk Assessment. The policy shall be not to increase the risk of flooding and to ensure risk to the development is managed.
SIO10	That recommendations and flood maps arising from the Fingal-East Meath CFRAM Study, the Dodder CFRAM Study and the Eastern CFRAM Study are taken into account in relation to the preparation of statutory plans and development proposals. This will include undertaking a review of the Strategic Flood Risk Assessment for Dublin city following the publication of the Final Eastern CFRAM Study, currently being produced by the OPW
SIO11	To work with neighbouring local authorities when developing cross-boundary flood management work programmes and when considering cross-boundary development
SIO12	To ensure each flood risk management activity is examined to determine actions required to embed and provide for

	effective climate change adaptation as set out in the Dublin City Council climate change adaption policy and in the OPW Climate Change Sectoral Adaptation Plan Flood Risk Management applicable at the time.
	NATURAL HERITAGE & LANDSCAPE
GI6	It is the Policy of Dublin City Council To support and implement the objectives of the National Landscape Strategy
GI7	To continue to protect and enhance landscape, including existing green spaces through sustainable planning and design for both existing community and for future generations in accordance with the principles of the European Landscape Convention.
GI8	To protect and enhance views and prospects which contribute to the appreciation of landscape and natural heritage. It is an Objective of Dublin City Council:
GI06	To prepare a Landscape Character Assessment (LCA) for Dublin city during the lifetime of the plan in accordance with the National Landscape Strategy and forthcoming national methodology
GI07	To promote the city landscapes, including rivers, canals and bay, as a major resource for the city and forming core areas of green infrastructure network
GI08	To undertake a 'Views and Prospects' study to identify and protect the key views and prospects of the city. Additional views and prospects may be identified through the development management process and local area plans
GI09	To maximise managed access to key landscape and amenity areas of Dublin city
GI1	It is the Policy of Dublin City Council: To develop a green infrastructure network through the city, thereby interconnecting strategic natural and semi-natural areas with other environmental features including green spaces, rivers, canals and other physical features in terrestrial (including coastal) and marine areas.
GI2	That any plan/project, either individually or in combination with other plans or projects that has the potential to give rise to significant effect on the integrity of any European site(s), shall be subject to an appropriate assessment in accordance with Article 6(3) and 6(4) of the EU Habitats Directives.
GI3	To develop linear parks, particularly along waterways, and to link existing parks and open spaces in order to provide green chains throughout the city. Where lands along the waterways are in private ownership, it shall be policy in any development proposal to secure public access along the waterway.
GI5	To co-ordinate open space, biodiversity and flood management requirements, in progressing a green infrastructure network.
GI5	To promote permeability through our green infrastructure for pedestrians and cyclists. It is an Objective of Dublin City Council:

GIO1:	To integrate Green Infrastructure solutions into new developments and as part of the development of a Green Infrastructure Strategy for the city
GIO2:	To apply principles of Green Infrastructure development to inform the development management process in terms of design and layout of new residential areas, business/ industrial development and other significant projects It is an Objective of Dublin City Council:
GIO3:	To focus on key streets in the city area between the canals for 'greening' by way of higher standards of planting and amenity along key routes.
GIO4	To improve pedestrian and cycle access routes to strategic level amenities while ensuring that ecosystem functions and existing amenity uses are not compromised and existing biodiversity and heritage is protected and enhanced.
GIO5:	To engage with and involve corporate volunteers, landowners and relevant agencies to support their communities in the development and delivery of green infrastructure programmes.
GI9	It is the Policy of Dublin City Council To incorporate open space into the green infrastructure network for the city, providing a multi-functional role including urban drainage, flood management, biodiversity, outdoor recreation and carbon absorption
GI10:	To continue to manage and protect and/ or enhance public open spaces to meet the social, recreational, conservation and ecological needs of the city and to consider the development of appropriate complementary facilities which do not detract from the amenities of spaces.
GI11:	To seek the provision of additional spaces in areas deficient in public open spaces – by way of pocket parks or the development of institutional lands.
GI12:	To ensure equality of access for all citizens to the public parks and open spaces in Dublin City and to promote more open space with increased accessibility and passive surveillance where feasible. In this regard the 'Fields in Trust' benchmark for green/recreational space city wide shall be a policy goal and quality standards.
GI13	To ensure that in new residential developments, public open space is provided which is sufficient in quantity and distribution to meet the requirements of the projected population, including play facilities for children.
GI14:	To promote the development of soft landscaping in public open spaces, where feasible, in accordance with the principles of Sustainable Urban Drainage Systems
GI19:	It is the Policy of Dublin City Council: To ensure a co-ordinated approach to the management of Dublin Bay with other State and semi-State agencies through the Dublin Bay Biosphere Partnership to develop a Biosphere Strategy for the sustainable development of Dublin Bay.
GI20:	To seek continued improvement in water quality, bathing facilities and other recreational opportunities in the coastal,

	estuarine and surface waters in the city, having regard to the sensitivities of Dublin Bay and to protect the ecology and wildlife of Dublin Bay.
GI21:	To support initiatives to reduce marine pollution in Dublin Bay in partnership with other organisations and to raise awareness by bay users and the general public and also to have regard to the Marine Strategy Framework Directive (2008/56/EC.)
GI22	To promote nature conservation of Dublin Bay by improving information and interpretation of its biodiversity for recreational users and visitors
GI23	To protect flora, fauna and habitats, which have been identified by Articles 10 and 12 of Habitats Directive, Birds Directive, Wildlife Acts 1976–2012, the Flora (Protection) Order 2015 S.I No. 356 of 2015, European Communities (Birds and Natural Habitats) Regulations 2011 to 2015.
GI24	To conserve and manage all-Natural Heritage Areas, Special Areas of Conservation and Special Protection Areas designated, or proposed to be designated, by the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
GI25	To make provisions for habitat creation/ maintenance and facilitate biodiversity by encouraging the development of linear parks, nature trails, wildlife corridors, urban meadows and urban woodlands
GI26:	To have regard to the conservation and enhancement of significant non-designated areas of ecological importance in accordance with
GIO22	It is an Objective of Dublin City Council To promote and upgrade visitor facilities at North Bull Island to raise awareness of biodiversity and promote nature conservation and manage recreation sustainably, having regard to Article (6) of the Habitats Directive. It is the Policy of Dublin City Council:
GI27:	To minimise the environmental impact of external lighting at sensitive locations to achieve a sustainable balance between the needs of an area, the safety of walking and cycling routes and the protection of light sensitive species such as bats. It is an Objective of Dublin City Council:
GIO23:	To support the implementation of the 'Dublin City Biodiversity Action Plan 2015–2020', including inter alia (a) the conservation of priority species, habitats and natural heritage features, and (b) the protection of designated sites
GIO24:	To develop Biosecurity Codes of Practice to deal with invasive species and ensure compliance with EU (Birds and Natural Habitats) Regulations 2011 and EU Regulations 2014 on the prevention and management of the introduction and spread of invasive alien species.
GI28:	To support the implementation of the Dublin City Tree Strategy, which provides the vision for the long-term planting, protection and maintenance of trees, hedgerows and woodlands within Dublin City

GI29:	To adopt a pro-active and systematic good practice approach to tree management with the aim of promoting good tree health, condition, diversity, public amenity and a balanced age-profile.
GI30:	To encourage and promote tree planting in the planning and development of urban spaces, streets, roads and infrastructure projects
GIO25	It is an Objective of Dublin City Council To protect trees in accordance with existing Tree Preservation Orders (TPOs) and, subject to resources, explore the allocation of additional TPOs for important/ special trees within the city based on their contribution to amenity or the environment.
GIO26	To review ancient and species-rich hedgerows within the city (as identified in the 2006 survey of ancient and species rich hedgerows in Dublin city) and protect existing hedgerow sections
GIO27	To protect trees, hedgerows or groups of trees which function as wildlife corridors or 'stepping stones' in accordance with Article 10 of the EU Habitats Directive.
GIO28	To identify opportunities for new tree planting to ensure continued regeneration of tree cover across the city, taking account of the context within which, a tree is to be planted and planting appropriate tree species for the location
GIO29:	To encourage trees to be incorporated in (a) the provision of temporary green spaces (e.g. pop-up parks) either planted into the soil or within moveable containers as appropriate and (b) within sustainable urban drainage systems (SUDS), as appropriate.

8.3 Recommended Mitigation Measures for the Dublin City CCAP

Overarching measure	**An integrated approach to decision making in relation to these climate change actions is recommended.**	**Included in CCAP Yes/no?**
Flood Resilience	**Recommended text in green**	
3	**Prepare and** Implement an **Integrated** Coastal Zone Management Plan **that addresses natural and cultural heritage and aligns with the Marine Spatial Planning Directive**	
7	Develop template to capture impacts, response and costs (**including ecosystem services/natural capital costs)** for all major climate events	
10	Update DLA urban drainage and flooding policies for current knowledge of flood risk and the latest best practice in drainage design **promoting natural flood measures as a priority**	
New text before Actions 11- 18 in Flood Resilience Section	The following flood storage actions will incorporate nature based solutions and biodiversity enhancement measures where possible.(Refers to actions 11 to 18)	
New measures to be consistent with neighbouring Local Authorities	***Communication and awareness campaigns on flood risk management and natural flood management measures***	

9 MONITORING

9.1 INTRODUCTION

It is proposed, in accordance with Article 10 of the SEA Directive, to base monitoring on a series of indicators which measure changes in the environment, especially changes which are critical in terms of environmental quality, for example water pollution levels. Monitoring will focus on the aspects of the environment that are likely to be significantly impacted upon by the implementation of the CCAP 2019-2024.

The targets and indicators are derived from the Strategic Environmental Objectives (SEOs) discussed in Chapter Five. The target underpins the objective whilst the indictors are used to track the progress of the objective and targets in terms of monitoring of impacts.

The monitoring programme will consist of an assessment of the relevant indicators and targets against the data relating to each environmental component. Similarly, monitoring will be carried out frequently to ensure that any changes to the environment can be identified.

Overall, this Climate Change Action Plan will be monitored and updated on an annual basis, with a review and revision every five years. This draft of the Climate Change Action Plan was developed through DCC's Climate Change Sub-Committee of the Environment SPC and approved by Environment SPC.

The Executive Manager of the Environment & Transportation Department will report on progress to the SPC annually and the SPC will monitor progress towards the set targets. Every five years there will be a full review and revision of the plan taking into account demographic, technical and other changes that have occurred and any new targets that have been introduced.

Consequently, it is recommended that this SEA monitoring regime be undertaken in line with the development plan review process; as the data will be captured through the CCAP monitoring regime, the strategic environmental monitoring can both use these data and also be derived from the planning and landuse data by DCC.

In turn the list below is subject to review at each reporting stage to reflect new data. Should the monitoring regime identify significant impacts (such as impacts on designated sites) early on in the plan implementation, this should trigger a review of the CCAP and monitoring regime. In addition, the identification of positive impacts from monitoring should also be reported as this will assist in determining successful environmental actions.

Dublin City Council are responsible for the implementation of the SEA Monitoring Programme including

- Monitoring specific indicators and identifying any significant effects, including cumulative effects;
- Reviewing the effectiveness of monitoring/mitigation measures during the lifetime of the CCAP; and

- Identifying any cumulative effects.

It is recommended that the monitoring report be made available to the public upon its completion. Table 12 below presents the SEA Monitoring Table. This table sets out the strategic environmental objectives, indicators and targets to be applied in monitoring the significant environmental effects of the implementation of the CCAP, in accordance with Section 13J(2) of the Planning and Development (SEA) Regulations 2004, as amended. It is proposed that the SEA monitoring reporting should go parallel with the reviewing of the CCAP to the CDP and when the next plan is being prepared.

Table 12 Monitoring Measures

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
Population and Human Health	To create a sustainable compact city and a high quality healthy safe environment in which to live, work and/or visit.	Sustainable densities achieved in new residential/ mixed use schemes	Average density of new residential development	Every 2 years	Planning and Property Development Department (PPDD)
		Increase the number of residential properties	Percentage increase of residential properties	Every 2 years	(PPDD)
		Improved access to community and recreational facilities	Percentage increase in the number of schools/ crèches/community parks/sports facilities and primary health centres	Every 2 years	(PPDD)
Biodiversity, Flora and Fauna	To protect and where appropriate enhance the diversity of habitats, species, ecosystems and geological features.	Maintain the favourable conservation status of all habitats and species which are within designated sites protected under national and international legislation and also habitats and species outside of designated sites.	Number of developments granted planning permission within designated sites.	Every 2 years	(PPDD) Parks and Landscape Services
			Number of Natura Impact Statements submitted to Dublin City Council	Every 2 years	Parks and Landscape Services
			Percentage increase or decrease of bat and otter	Every 2	Parks and Landscape

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
			populations in Dublin city	years	Services
		Deliver the objectives of the Dublin City Biodiversity Action Plan 2015–2020	Number of objectives/ policy actions delivered by the biodiversity plan	Every 2 years	Parks and Landscape Services
		Implementation of the actions from the green infrastructure strategy for Dublin city	Number of projects delivered by the green infrastructure strategy	Every 2 years	(PPDD) Parks and Landscape Services
			Totals of, or reduction in the quantum of greenfield lands; length of linked green corridors		(PPDD) Parks and Landscape Services
		Control and protect against the spread of noxious weeds and invasive species	Number of projects within the city that have identified noxious weeds and invasive species	Every 2 years	(PPDD) Parks and Landscape Services
		Achieve the objectives of the Tree Strategy and Canopy Survey for Dublin city	Percentage increase of tree planting within Dublin city	Every 2 years	(PPDD) Parks and Landscape Services
			Tree canopy cover within the city area to contribute to carbon sequestration (no. of	Every 2 years	Parks and Landscape Services

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
			trees)		
		Implementation of setback/ buffer zones of 10 m for development along watercourses	Number of planning applications adhering to the 10 m buffer zone setback	Every 2 years	(PPDD)
		Increased provision for soft landscaping in existing and new developments	Amount of open space provided in planning applications for Z10 and Z15 lands	Every 2 years	(PPDD)
Climatic Factors Air Quality	Contribute to the mitigation of/ and adaptation to climate change and implement requirements of Strategic Flood Risk assessment. Minimise emissions of pollutants to air associated with development activities and maintain acoustic quality.	Maintain air quality status and meet value targets for named pollutants in line with Air Quality Framework Directives	Values of monitored pollutants in the air, including the levels of Nitrogen Oxides (NO_x) and Particulate matter (PM_{10}) not breach regulation limits	Every 2 years	Roads and Traffic – Noise and Air Section
		Decrease greenhouse gas emissions in line with national targets	Average energy consumption of new residential housing stock, tonnes of CO_2/ year	Every 2 years	Energy Division
		Increase energy efficiency (reduce energy waste) from renewable energy sources in line with the National Energy Efficiency Action	Number of objectives implemented from Dublin City Energy Strategy	Every 2 years	Energy Division
			Number of permitted developments that include	Every 2	Energy Division

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
		Plan	district heating	years	
			Number of permitted developments incorporating solar renewables	Every 2 years	Energy Division
			Number of (social) housing units, public buildings and community centres connected to district and group heating systems	Every 2 years	Energy Division
		Produce noise maps for Dublin city and ensure they are updated	Number of zonings that conflict in relation to acoustic increases	Every 2 years	Roads and Traffic – Noise and Air Section
		Increase modal shift to public transport, walking and cycling	Percentage/quantum of population travelling to work by public transport, walking and/ or cycling.	Every 2 years	Roads and Traffic
		Compliance with the requirements of the Development Plan's Strategic Flood Risk Assessment	Percentage of planning applications compliant with the SFRA	Every 2 years	(PPDD) Environment and Engineering – Water Division
		Compliance with the OPW's Guidelines for Planning	Percentage of planning applications incorporating	Every 2	(PPDD)

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
		Authorities – The Planning System and Flood Risk Management	flood risk assessment and conditions requiring appropriate flood resilient measures for new developments	years	Environment and Engineering – Water Division
		Implement Sustainable Urban Drainage Systems in all new developments	Number of Sustainable Urban Drainage Systems implemented in new planning applications	Every 2 years	(PPDD) Environment and Engineering – Water Division
Water	To protect and where necessary improve the quality and management of watercourses and groundwater, in compliance with the requirements of all water and habitat based legislation, including the River Basin Management Plan of the Eastern River Basin District.	Achieve and maintain good status of all surface water bodies.	Improvement in Status of Water Body as per RBMP	Every 2 years	Environment and Engineering – Water Division
		All designated bathing waters to comply with the requirements of the Bathing Water Quality Regulations 2008 (S.I. 79 of 2008)	Bathing waters comply with requirements of Bathing Water Regulations	Every 2 years	Environment and Engineering – Water Division
		Identify and provide Surface Water pipelines as appropriate	Lengths of new Surface Water pipeline installed	Every 2 years	Environment and Engineering – Water Division
Material Assets	To make best use of Dublin city's infrastructure and material assets and to	Develop public transport, cycleways and road infrastructure to facilitate	Percentage change in commuting modal shift to	Every 2 years	Environment and Transportation

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
	promote the sustainable development of new infrastructure to meet the needs of the city's population	sustainable growth and travel patterns	sustainable travel modes		
		Extend and improve the cycling and walking network	Number of new cycling and walking schemes implemented	Every 2 years	Environment and Transportation
		Comply with the Eastern Midlands Waste Management Plan and operate sustainable waste management practices	Quantum of residential and commercial waste reused and recycled	Every 2 years	Engineering – Waste Management
		Protect and enhance green infrastructure	Number of greenfield sites developed	Every 2 years	(PPDD) Parks and Landscape Services
Cultural Heritage	To protect and where appropriate enhance the character, diversity and qualities of Dublin city's cultural, including architectural and archaeological, heritage	No loss or adverse impact on the fabric or setting of monuments on the Record of Monuments	Number of planning applications with archaeological conditions that were complied with	Every 2 years	(PPDD)
		No loss of or adverse impact on the architectural heritage value or setting of protected structures and monuments	Loss of, or adverse impact on protected structures, architectural conservation areas or NIAH structures	Every 2 years	(PPDD) City Architects – Conservation
			Number of archaeological	Every 2	(PPDD)

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
			sites with archaeological conditions attached	years	City Architects – Conservation
		No loss of or adverse impact on structures recorded on the National Inventory of Architectural Heritage	Number of protected structures put at risk or on the derelict sites register	Every 2 years	(PPDD) City Architects – Conservation
		Revision of the Dublin Heritage Plan 2002–2006, to ensure enhancement of key sites	Number of conservation plans implemented through the Dublin Heritage Plan	Every 2 years	(PPDD) City Architects – Conservation City Archaeologist
			Number of proposed plans and schemes screened/assessed by the Conservation Officer for the City and City Archaeologist	Every 2 years	(PPDD) City Architects – Conservation City Archaeologist
			Number of Architectural Conservation Areas designated	Every 2 years	(PPDD) City Architects – Conservation
Landscape and Soils	To protect and where appropriate enhance the character, diversity and	Develop new areas of open space and increase number of trees	Number of new parks/ open spaces, change in area of the parks and number of trees	Every 2 years	(PPDD) Parks and Landscape

Environmental Receptor	Environmental Protection Objective	Target	Indicator	Frequency of Reporting	Department Responsible
	special qualities of Dublin city's landscapes and soils and geological features		planted		Services
		Create a well-connected city landscape consisting of linear connections (e.g. river corridors and networks)	Length of existing and new linked landscape corridors	Every 2 years	(PPDD) Parks and Landscape Services
		Develop brownfield lands and vacant sites	Total area of brownfield lands and vacant sites developed	Every 2 years	(PPDD) Parks and Landscape Services
Inter-relationships	***Maintain and improve the health of people, ecosystems and natural processes*** ***Actively seek to integrate opportunities for environmental enhancement during adaptation to climate change***	Integration of blue and green infrastructure measures including in approved planning applications within Dublin City Council including SUDS, Integrated Wetlands, Hedgerows, Native tree planting scheme	***Blue and Green Infrastructure measures implemented over lifetime of plan*** Number of Blue infrastructure features included in development		

9.3 Conclusion

This SEA Environmental Report demonstrates how environmental parameters have been addressed in the plan preparation process. Consultation has been undertaken for the Scoping of this Environmental Report and further opportunity to comment on the CCAP will be possible over the forthcoming weeks.

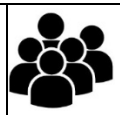
The SEA and Appropriate Assessment processes have been undertaken in line with the Planning and Development (Strategic Environmental Assessment) Regulations 2004 to 2011 (as amended). Subject to the full and proper implementation of the mitigation measures outlined in this SEA Environmental Report and the Proposed CCAP, it is considered that significant adverse impacts on the environment will be avoided.

ANNEX A: DETAILED ASSESSMENT OF ACTIONS IN THE DUBLIN CLIMATE CHANGE ACTION PLAN 2019-2024

No likely interaction with /insignificant impact with SEOs	0	Potential conflict with SEOs – likely to be mitigated	⇳
Likely to improve status of SEOs	↑	Probable conflict with SEOs – unlikely to be mitigated	↓

SEA Topic								
Biodiversity Flora and Fauna	Population and human health Noise	Water Resources including flood	Soil and Geology	Material Assets	Air Quality and Climatic Factors	Cultural Heritage	Landscape	Interrelationship
								

ENERGY AND BUILDINGS

	Action Area									
	Energy Planning									
1	Create Energy Master Plan for the Dublin Region	⇳	↑	⇳	⇳	⇳	↑	⇳	⇳	↑
2	Requirement for all new developments to be district heating-enabled in Poolbeg West, North Lotts and Grand Canal SDZs	⇳	↑	↑	⇳	↑	↑	↑	↑	↑
3	Prepare Dublin City Sustainable Energy and Climate Action Plan	↑⇳	↑	↑	↑	↑	↑	↑	↑	↑
4	Evidence-based climate change chapter in County Development Plan 2022-2028	↑	↑	↑	↑	↑	↑	↑	↑	↑
	ENERGY Management									

	Action Area									
5	Develop ISO 50001 compliant energy management system	O	↑	↑	↑	↑	↑	↑	↑	↑
6	Annual Monitoring and Reporting to SEAI	**O**	↑	↑	↑	↑	↑	↑	↑	↑
7	Publish Energy Review annually	O	↑	O	O	↑	↑	O	O	↑
8	Display Energy Certificates for public buildings	O	↑	O	O	↑	↑	O	O	↑
	ENERGY EFFICIENCY & RENEWABLES									
9	Identify sites for trialling renewable energy projects, including Solar PV	↕	↑	↑	↑	↑	↑	↑	↑	↑

	Action Area									
10	Energy efficiency works in 30 Council owned and operated buildings	↑	↑	↑	↑	↑	↑	↑	↑	↑
11	Dublin Fire Brigade energy efficiency works	O	↑	O	O	↑	↑	O	O	↑
12	Continue the Fabric Upgrade Programme of housing stock	O	↑	O	O	↑	↑	O	O	↑
13	Develop and implement Public Lighting Master Plan	↕	↑	O	O	↑	↑	O	O	↑
14	Landlord lighting upgrades in 15 complexes across the City	↕	↑	O	O	↑	↑	O	↑	↑
15	Facilitate EPC project in 7 leisure centres/dry sports centres across Dublin City	↑	↑	↑	↑	↑	↑	↑	↑	↑

	Action Area									
16	Install PV panels on Council buildings in Dominick Street, North King Street, Cornamona Court	O	↑	↑		↑	↑	O	O	↑
17	New nZEB Super Depots	O	↑	↑	↑	↑	↑	↑	↑	↑
	RESEARCH & INNOVATION									
18	Develop proposal to use Docklands SDZ to test smart public lighting infrastructure	↑	↑	↑	↑	↑	↑	↑	↑	↑
19	Expand and develop Small Business Innovation & Research (SBIR) programme	↑	↑	↑	↑	↑	↑	↑	↑	↑
20	Work with CARO on research and project proposals for grant funding	↑	↑	↑*O*	↑*O*	↑	↑	*O*	↑O	↑
	ENERGY AWARENESS									

	Action Area									
21	Continued staff energy awareness in Council buildings	O	↑	O	O	↑	↑	O	O	↑
22	Engage with students about energy and buildings through CPD Programme/Engineers Week		↑		↑	↑	↑	↑		↑
23	Provide citizens with energy awareness material in public buildings		↑			↑	↑			↑
24	Provide City Council tenants with energy awareness materials at home, particularly at the time of taking up new tenancy		↑			↑	↑			↑
25	Monitor and develop the Home Energy Savings Kits in DCC's public libraries		↑			↑	↑			↑

	Action Area									
	ENERGY & BUILDINGS									
26	*Develop research and funding opportunities for renewable and efficiency projects*	↑	↑	↑	↑	↑	↑	↑	↑	↑
27	Dublin District Heating System	↑	↑	↑	↑	↑	↑	↑	↑	↑
28	Undertake programme of flat complex regenerations	↑	↑	↑	↑	↑	↑	↑	↑	↑

Comment: For all of the above actions there are positive, long term impacts regarding climate change, air quality, population and human health and overall will achieve consistency with the Interrelationship SEOs.

For a number of the actions, there are no significant interactions identified for a number of SEOS, examples being energy awareness raising and SEOs relating to water.

For some of the actions such as grand applications/funding in conjunction with CARO (Action 20) neutral or positive effects for SEOs around biodiversity, landscape as the detail at this stage is not known.

For proposals around lighting, district heating, energy masterplans – impacts may be identified, again for Biodiversity e.g.; adverse effects on lighting of dark corridors used for commuting by species such as otters/bats. However, existing provisions of the Dublin City CDP 2016-2022 are considered to be appropriate and robust in this instance to ensure adverse effects are avoided.

For energy and building actions, positive long term effects relating to cumulative action addressing greenhouse gas emissions across all SEOs are identified. Though small,

	Action Area									
combined together, these actions can make a contribution and showcase best practice elsewhere. *A small number of SEOs could, in the absence of mitigation give rise to potential adverse effects; these relate to the following:* *Action 1: Create an Energy Masterplan for Dublin,* *Action 2: District heating enabled in Strategic Development Zones* *Action 3: Develop a Public Lighting Masterplan "* *However, there are sufficient and appropriate mitigation measures through environmental protection measures in the DCC CDP 2016-2022 to address these and provide appropriate mitigation.*										

TRANSPORT

	TRANSPORT									
1	Develop strategy to convert fleet to low emission vehicles	O	↑	O	O	↑	↑	O	O	↑
2	Pilot more electric vehicles within Council fleet	O	↑	O	O	↑	↑	O	O	↑

	TRANSPORT									
3	Conduct detailed study of staff modal split	O	↑	O	O	↑	↑	O	O	↑
4	Promote Cycle-to-Work Scheme to DCC staff	O	↑	O	O	↑	↑	O	O	↑
5	Implement Smart Mobility Hub in Civic Offices	O	↑	O	O	↑	↑	O	O	↑
6	Carbon offset programme for staff flights	↑	↑	↑	↑	↑	↑	↑	↑	↑
7	Occupational driver training for fleet staff	O	↑	O	O	↑	↑	O	O	↑
8	Assess potential for using an e-mobile for real time air quality monitoring in the City Centre	O	↑	O	O	↑	↑	O	O	↑
	PLANNING &									

	TRANSPORT									
	PUBLIC REALM									
9	Implement the measures outlined in the Dublin City Centre Transport Study 2016	↑	↑	↑	↑	↑	↑	↑	↑	↑
10	Implement traffic calming programme	O	↑	O	O	↑	↑	O	↑	↑
11	Expand 30 km/h speed limit zones to all residential areas of the City	O	↑	O	O	↑	↑	O	O	↑
12	D30 public awareness campaign of speed limits in City	O	↑	O	O	↑	↑	O	O	↑
13	Regular maintenance of regional and local roads	↕	↑	↕	O	↑	↑	O	O	↑
14	Rolling out last mile delivery eco hubs in the City Centre Area	↑	↑	↑	↑	↑	↑	↑	↑	↑

	TRANSPORT									
15	Develop 'last mile' delivery solutions, as part of SBIR challenge		↑			↑	↑			↑
16	Phase I Pedestrian Zones (2016-2022): • Liffey Street • Mary Street • Talbot Street • Castle Street/Cork Hill • Barnardo's Square • Temple Bar Public Realm	↑	↑	↑	↑	↑	↑	↑	↑	↑
17	Phase II Pedestrian Zones (2023-2028): • Dame Street West • Lord Edward Street • Parnell Street	↑	↑	↑	↑	↑	↑	↑	↑	↑

	TRANSPORT									
	• O'Connell Bridge • D'Olier Street • Lombard Street • Westland Row • Nassau Street • Aungier Street/Valentine District • Merrion Square • Pearse Street • North Lotts North Quays									
18	Phase III Pedestrian Zones (2029 and beyond): • South Quays	↑	↑	↑	↑	↑	↑	↑	↑	↑

	TRANSPORT									
	• Tara Street Parkgate Street									
19	To investigate the introduction of traffic-free areas on sections of • Drury Street • South William Street • Exchequer Court • Dame Court • Dame Lane retaining access for car parks and deliveries	↑	↑	↑	↑	↑	↑	↑	↑	↑

	TRANSPORT									
20	World Car Free Day	↑	↑	↑	↑	↑	↑	↑	↑	↑
21	European Mobility Week	O	↑	O	O	↑	↑	O	O	↑
22	DCC to liaise with NTA on BusConnects programme	↕	↑	↑	↑	↑	↑	↕	↕	↑
23	2 EV Charging point trials in the Docklands	O	↑	O	O	↑	↑	O	O	↑
24	Assessment of Council public car parks for trickle and rapid charge EV points	O	↑	O	O	↑	↑	O	O	↑
	ACTIVE TRAVEL & BEHAVIOUR CHANGE									
25	Organise Pedestrian Days in areas with high footfall	O	↑	O	O	↑	↑	O	↑	↑

	TRANSPORT									
26	Identify and promote use of new routes on Hike It! Bike It! Like It! platform	⇳	↑	⇳	↑	↑	↑	↑	↑	↑
27	Develop cycle network strategy	⇳	↑	⇳	⇳	⇳	↑	⇳	⇳	↑
28	Dodder Greenway (Pedestrian and Cycle Improvement) - 7.5Km section	↑	↑	↑	↑	↑	↑	↑	↑	↑
29	4 km Clontarf-to-City Centre Cycle Scheme	⇳	↑	↑	↑	↑	↑	↑	↑	↑
30	Liffey Cycle Route	O	↑	↑	↑	↑	↑	⇳	⇳	↑
31	Fitzwilliam Cycle Route - 1 km route with upgrades for junctions	O	↑	↑	↑	↑	↑	↑	↑	↑
32	Sandyford-to-City Centre Cycle Scheme -	⇳	↑	⇳	↑	↑	↑	⇳	⇳	↑

	TRANSPORT									
	proposal and options for 9 km route									
33	Royal Canal Phase 3 - 2.1 km two-way cycle track with pedestrian route	↑	↑	↑	↑	↑	↑	↑	↑	↑
34	Grand Canal Premium Cycle Route - 4.4 km addition to route linking Portobello to Blackhorse	O	↑	↑	↑	↑	↑	↑	↑	↑
35	Pedestrian and cycle bridges over the Royal Canal at North Wall Quay	O	↑	↑	↑	↑	↑	↑	↑	↑
36	Cycle Training Programme for 6th Class students / Pedal Power Labs	O	↑	↑	↑	↑	↑	↑	↑	↑
37	Emissions-linked parking charges in City Centre	↑	↑	↑	↑	↑	↑	↑	↑	↑

	TRANSPORT									
38	Increase number of public bike parking facilities	O	↑			↑	↑	↕	↑↕	↑
39	Expand Stationless Bike scheme	O	↑	O	O	↑	↑	O	O	↑
40	Expand Dublinbikes scheme	O	↑	O	O	↑	↑	↕	↕	↑
41	Implement policy to increase modal shift to cycling	↑	↑	↑	↑	↑	↑	↑	↑	↑
42	DCC to host Velo City 2019	O	↑	O	O	↑	↑	O	O	↑
43	Install pilot Electric Vehicle charging station at John Rogersons Quay	O	↑	O	O	↑	↑	O	O	↑
44	Samuel Beckett Bridge segregated cycle lane	O	↑	O	O	↑	↑	O	O	↑

	TRANSPORT									
	PUBLIC TRANSPORT									
45	Sustainable transport hubs – various locations	⇳	↑	⇳	⇳	↑	↑	⇳	⇳	↑
46	Develop bus routes including the Bus Connects programme	⇳	↑	⇳	⇳	↑	↑	⇳	⇳	↑
47	Carry out Canal Cordon Count	O	↑	O	O	O	O	O	O	↑
48	Implement policy to increase modal shift to public transport	↑	↑	↑	↑	↑	↑	↑	↑	↑
49	Implement policy to give bus priority on core bus network	↑	↑	↑	↑	↑	↑	↑	↑	↑
	TRANSPORT									

	TRANSPORT									
50	*Develop a strategy to promote car sharing*	*O*	↑	*O*	*O*	↑	↑	*O*	*O*	↑
51	*Expand availability of EV charging points*	*O*	↑	*O*	*O*	↑	↑	*O*	*O*	↑
52	*Replace diesel hand sweepers/power washers with electric models*	*O*	↑	*O*	*O*	↑	↑	*O*	*O*	↑
53	*Dublin City Council to promote Mobility-as-a-Service (MaaS) initiatives in the City to increase active travel options*	*O*	↑	*O*	*O*	↑	↑	*O*	*O*	↑

Comment: As with the energy actions, all of these actions for Transport generate positive, medium to long term effects across Climate change, Air quality, Material Assets and Human Health.

Actions such as 14, 16, 18 and 19 that reduce traffic in town and seek to implement/research pedestrian areas in the city centre are positive and create long, term positive effects across all parameters. These actions can lead to a decline in local air pollution hotspots with accompanying benefits for population and human health as well as biodiversity. In addition these actions result in a reduction in noise emissions with accompanying positive benefits for the public and urban realm. Increase permeability means that opportunities to enhance green infrastructure measures at local scale can also be considered.

Cumulatively and in combination, several of this actions encourage a modal shift and in turn this would give rise to indirect positive effects, for example by creating

	TRANSPORT									

more physical activity in terms of travel to work and school, positively affecting air quality with accompanying benefits to both populations, human health and with a reduction in emissions associated with Particulate Matter and Nitrogen Dioxide positive effects on Biodiversity, flora and fauna and surface water features.

A number of these Transport Actions are recommended for mitigation either due to the potential in the absence of mitigation on conservation management objectives of European Sites (Actions 12, 13 and 14); however it is considered the existing environmental protection measures in the DCC CDP2016-2022 should address these potential effects appropriately.

The following Actions Dodder greenway (action 28)and Action 32 –Sandyford to City routes are identified in the AA Screening as needed to progress to Stage 11 AA as given the absence of specific details (no finalised route was available at the time of writing; a preferred emerging route was published in Oct. 2018) regarding this projects the potential likely significant effects to the follows European Sites cannot be ruled out at this stage:

Action 45 was described in the AA screening as follows:

Yes. Given that the location of these hubs are not known and that their provision is likely to result in land use works the potential for likely significant effects to the following European Sites cannot be ruled out at this stage:

North Dublin Bay SAC;

North Bull Island SPA;

South Dublin Bay River Tolka Estuary SPA;

South Dublin Bay SAC; and

Baldoyle Bay SAC.

In terms of larger/regional transport actions (e.g. Bus Connects) the SEA ER of the Eastern and Midland RSES (draft) highlights the following

Modifications to existing road and rail routes, and the building of any new routes, have potential to impact negatively on biodiversity. Any potential impacts of on-going or proposed road or rail projects should be considered. Key projects include proposed road projects in the Region and an aspiration for the future twin tr acking of the rail line both north and south from Dublin with the DART extension involving electrification of part of it. As the rail line runs adjacent to, and in s

	TRANSPORT									

ome cases through, European sites, such projects will require appropriate assessment. In addition to loss of annexed habitat there is potential for bird collisions with overhead cables for the DART where it crosses estuaries such as at Malahide and Rogerstown (Scoping submission)

Construction of linear road and rail infrastructure has the potential for short to long term direct and indirect negative effects for all environmental receptors as a result of emissions, habitat loss and disturbance of species, deterioration in air quality and noise disturbance. Robust feasibility studies and site / route selection are the most effective manner to reduce impacts on the environment from such enhancements and the RSES should require these stages are fully delivered before decisions are made. It is particularly important that demand management and overall systems management options are given proper consideration as options to online and offline solutions. It is acknowledged that investment priorities for these strategic assets are administered by other agencies and departments and as such an RPO which seeks to proactively engage with the key stakeholders for land transport would be a positive addition

(Discussion in SEA ER of Transport policies)

FLOOD RESILIENCE

	FLOOD RESILIENCE									
	FLOOD RISK MANAGEMENT									
1	Implement flood risk management guidelines	↑	↑	↑	↑	↑	↑	↑	↑	↑

	FLOOD RESILIENCE									
2	Coordinate Emergency Response Plans	↑	↑	↑	↑	↑	↑	↑	↑	↑
3	Implement flood awareness campaign with the OPW	↕	↑	↕	↕	↑	↑	↕	↕	↑
4	Monitoring of flood forecasting and warning system	↑	↑	↑	↑	↑	↑	↑	↑	↑
5	Produce new Design Guide for SuDS	↑	↑	↑	↑	↑	↑	↑	↑	↑
6	Implement Sustainable urban Drainage Guidelines in Council buildings	↑	↑	↑	↑	↑	↑	↑	↑	↑
7	Build demonstration sites to show options for SuDS	↑	↑	↑	↑	↑	↑	↑	↑	↑
8	Establish a Dublin Bay Sentinel Group, led by DCC and including other key	↑	↑	↑	↑	↑	↑	↑	↑	↑

	FLOOD RESILIENCE									
	stakeholders, to monitor tide levels and other marine related flood risk issues in Dublin Bay.									
9	Develop and implement **an Integrated** Coastal Zone Management plan for Dublin Bay, considering natural and cultural heritage, aligned with County Climate Change Action Plans, other local authority plans and strategies **and aligns with the Marine Spatial Planning Framework Directive.**	↕	↑	↕	↕	↑	↑	↕	↕	↑
10	Implement the Dublin Bay Biosphere work programme	↑↕	↑	↑	↑	↑	↑	↑	↑	↑
11	Trial hemp baskets for flood protection	↑	↑	↑	↑	↑	↑	↑	↑	↑
1	Identify areas for integrated	↕	↑	↑	↑	↑	↑	↑	↕	↑

	FLOOD RESILIENCE									
2	constructed wetlands									
13	Expansion of rainfall sensors and weather stations, as part of the Connect Flooding Demonstrator programme	O	↑	↑	↑	↑	↑	↑	↕	↑
14	Phase 2 of Gully Monitoring SBIR Challenge	O	↑	↑	↑	↑	↑	↑	↕	↑
15	Develop a climate change impact GIS risk map with scenarios for the Dublin Region	↑	↑	↑	↑	↑	↑	O	O	↑
16	Develop template to capture impacts, response and costs **including ecosystem services/natural capital costs** for all major climate events	↕	↑	↑	↑	↑	↑	↑	↕	↑
17	Establish a Working Group to deal with the issue of pluvial flood	↕	↑	↑	↑	↑	↑	↑	↕	↑

	FLOOD RESILIENCE									
	risk. This shall include: • How to manage "urban creep" and the increase in impermeable surfaces • Promotion of SuDS early in design process • Development of pluvial flood forecasting through use of point rainfall forecasting • Interim use of DCC "FLAG"meetings as a model for DLAs in relation to pluvial flood forecasting and response. • Water quality									
18	Update DLA urban drainage and flooding policies for current knowledge of flood	⇳	↑	↑	↑	↑	↑	↑	⇳	↑

	FLOOD RESILIENCE									
	risk and the latest best practice in drainage design **promoting natural flood measures as a priority**									
19	Risk workshops to assess impacts on Council services	⇳	↑	↑	↑	↑	↑	↑	⇳	↑
	FLOOD DEFENCE									
The following flood storage actions will incorporate nature based solutions and biodiversity enhancement measures where possible										
20	South Campshires Flood Defence	↑	↑	↑	↑	↑	↑	↑	↑	↑
21	Sir John Rogerson's Quay flood alleviation scheme	↑	↑	↑	↑	↑	↑	↑	↑	↑
22	North Campshires flood alleviation scheme	↑	↑	↑	↑	↑	↑	↑	↑	↑
23	Clanmoyle flood alleviation scheme	↑	↑	↑	↑	↑	↑	↑	↑	↑

	FLOOD RESILIENCE									
24	Wad flood alleviation scheme	↑	↑	↑	↑	↑	↑	↑	↑	↑
25	Poddle flood alleviation scheme	↕	↕	↕	↕	↕	↕	↕	↕	↕
26	Camac flood alleviation scheme	↕	↕	↕	↕	↕	↕	↕	↕	↕
27	Dollymount flood alleviation scheme	↑	↑	↑	↑	↑	↑	↑	↑	↑
28	Clontarf Promenade flood alleviation scheme	↑	↑	↑	↑	↑		↑	↑	
29	Sandymount Promenade flood alleviation scheme	↕	↕	↕	↕	↕	↕	↕	↕	↕
30	Sandymount Phase 2 flood alleviation scheme	↕	↕	↕	↕	↕	↕	↕	↕	↕

	FLOOD RESILIENCE									
31	Chapelizod flood alleviation scheme	⇳	⇳	⇳	⇳	⇳	⇳	⇳	⇳	⇳
32	Island Bridge flood alleviation scheme	⇳	⇳	⇳	⇳	⇳	⇳	⇳	⇳	⇳
33	Santry River Regeneration Project	⇳	⇳	⇳	⇳	⇳	⇳	⇳	⇳	⇳
34	River Dodder Flood Defence Works in the fluvial section upstream of Ballsbridge	⇳	⇳	⇳	⇳	⇳	⇳	⇳	⇳	⇳
	FLOOD RESILIENCE									
35	*Study impacts and benefits of increased buffer distances to watercourses*	↑	↑	↑	↑	↑	↑	↑	↑	↑
36	*Promote and encourage community involvement in the retrofit of SuDS in existing*	↑	↑	↑	↑	↑	↑	↑	↑	↑

	FLOOD RESILIENCE									
	developments									
	Communication and awareness campaigns on flood risk management and natural flood management measures									

Comment:

In relation to the Coastal Zone Management Plan it is recommended that additional mitigation be provided to allow for the preparation of an integrated coastal zone plan that addresses cultural and well as natural resources and heritage and is line with the Marine Spatial Planning Directive.

For several of the flood related projects positive effects are identified as they have already been through the consenting process and are completed. For a series of other actions like such as Action 25 (Poddle,) 26 (Camac), 31 Chapelizoid – these actions are identified as requiring mitigation but it is considered that sufficient mitigation measures are present in either the SEA or Dublin City CDP 2016-2022 relating to flood management. However, to promote co benefits and avoid where possible an over-engineered approach to such works, an overarching mitigation measure promoting nature based solutions where possible is recommended at the start of this section.

A new mitigation measure in relation to awareness raising is recommended to ensure regional consistency across the DLAs in citizen engagement and awareness raising around flood risk management and natural flood management measures.

NATURE BASED SOLUTIONS

	NATURE-BASED SOLUTIONS									
	OPERATIONS									
1	Establish regional working group on nature-based solutions	↑	↑	↑	↑	↑	↑	↑	↑	↑
2	Agree joint action plans to protect native habitats and species across all 4 DLAs	↑	↑	↑	↑	↑	↑	↑	↑	↑
3	Establish a cross-departmental Trees and SUDS Working Group to promote and pilot water sensitive urban design incorporating urban tree planting	↑	↑	↑	↑	↑	↑	↑	↑	↑
4	Workshop on Trees and SUDS	↑	↑	↑	↑	↑	↑	↑	↑	↑

	NATURE-BASED SOLUTIONS									
5	Produce regional river basin management guidelines. Use Santry River as demonstration	↑	↑	↑	↑	↑	↑	↑	↑	↑
6	Facilitate an annual workshop for information exchange between biodiversity experts	↑	↑	↑	↑	↑	↑	↑	↑	↑
7	Collect data to inform the preparation of a list of habitats and species in Dublin City vulnerable to climate change	↑	↑	↑	↑	↑	↑	↑	↑	↑
	GREEN INFRASTRUCTURE									
8	Develop Green Infrastructure Strategy for region	↑	↑	↑	↑	↑	↑	↑	↑	↑
9	Implement Public Open	↑	↑	↑	↑	↑	↑	↑	↑	↑

	NATURE-BASED SOLUTIONS									
	Space and Parks Strategy									
10	Map access to green space in City to identify areas of need	↑	↑	↑	↑	↑	↑	↑	↑	↑
11	Continued development of the Dodder Greenway	↕	↕	↕	↑	↑	↑	↕	↕	↑
12	Assess the feasibility of green walls	↑	↑	↑	↑	↑	↑	↑	↑	↑
	TREE MANAGEMENT									
13	Implement *Dublin City Tree Strategy*	↑	↑	↑	↑	↑	↑	↑	↑	↑
14	Continue to map and collect data on trees in Dublin City	↑	↑	↑	↑	↑	↑	↑	↑	↑
15	Promote and expand Native Tree Trails programme	↑	↑	↑	↑	↑	↑	↑	↑	↑

	NATURE-BASED SOLUTIONS									
16	Produce guidance on species of public trees for urban planting in accordance with Action 3.1 of the *Dublin City Tree Strategy*	↑	↑	↑	↑	↑	↑	↑	↑	↑
17	Tree-planting activities with schools including annual National Tree Week and National Tree Day	↑	↑	↑	↑	↑	↑	↑	↑	↑
18	Investigate the use of the DAFM NeighbourWood Planting scheme for use in suitable urban area as part of the DCC Tree Strategy	↑	↑	↑	↑	↑	↑	↑	↑	↑
	NATURE CONSERVATION	↑	↑	↑	↑	↑	↑	↑	↑	↑
19	Implement *Dublin City Council Invasive Alien Species Action Plan*	↑	↑	↑	↑	↑	↑	↑	↑	↑

	NATURE-BASED SOLUTIONS									
20	Promote international World Wetlands Day	↑	↑	↑	↑	↑	↑	↑	↑	↑
21	Provide data to RAMSAR	↑	↑	↑	↑	↑	↑	↑	↑	↑
22	Prepare and publish *Flora of Bull Island*	↑	↑	↑	↑	↑	↑	↑	↑	↑
23	Conduct a common cord-grass management study and monitoring for North Bull Island SPA	↑	↑	↑	↑	↑	↑	↑	↑	↑
24	Prepare a GIS-based ecological sensitivity map of Dublin Bay Biosphere	↑	↑	↑	↑	↑	↑	↑	↑	↑
25	Participate in the INTERREG-funded Acclimatize research project	↑	↑	↑	↑	↑	↑	↑	↑	↑
2	Conduct light-bellied brent	↑	↑	↑	↑	↑	↑	↑	↑	↑

	NATURE-BASED SOLUTIONS									
6	goose roost survey									
27	Implement the North Bull Island Management Plan	↑	↑	↑	↑	↑	↑	↑	↑	↑
	NATURE-BASED SOLUTIONS	↑	↑	↑	↑	↑	↑	↑	↑	↑
28	*Pilot projects for green roofs on civic buildings*	↑	↑	↑	↑	↑	↑	↑	↑	↑
29	*Develop demonstration sites to showcase nature-based solutions with existing land uses*	↑	↑	↑	↑	↑	↑	↑	↑	↑
30	North East Inner City Greening Strategy	↑	↑	↑	↑	↑	↑	↑	↑	↑
31	*Develop urban woodland strategy*	↑	↑	↑	↑	↑	↑	↑	↑	↑
3	*Incorporate tree and shrub*	↑	↑	↑	↑	↑	↑	↑	↑	↑

	NATURE-BASED SOLUTIONS									
2	*planting in all new Council housing developments*									
33	*Assess feasibility of urban orchards*	↑	↑	↑	↑	↑	↑	↑	↑	↑
34	*Produce A Guide to Sustainable Living in Dublin City*	↑	↑	↑	↑	↑	↑	↑	↑	↑
35	*Identify sites suitable for community gardens for local food production*	↑	↑	↑	↑	↑	↑	↑	↑	↑
36	*Assessment of causes and impacts of Ectocarpus brown algal growth in Dublin Bay*	↑	↑	↑	↑	↑	↑	↑	↑	↑
37	*Prepare a preliminary list of species and habitats vulnerable to climate change for informing environmental impact*	↑	↑	↑	↑	↑	↑	↑	↑	↑

	NATURE-BASED SOLUTIONS									
	assessments									
38	*Prepare an analysis of soil sealing in Dublin City to determine levels of permeability*	↑	↑	↑	↑	↑	↑	↑	↑	↑
Comment: the nature based solutions provide for consistency with all the SEOs. This is largely due to the multi-benefit effects of such actions, for example expanding county tree canopy and green roofs will all provide co-benefits to biodiversity, flora and fauna, assist with air quality purification, with accompanying positive effects on human health, assist with carbon storage, and provide landscape benefits. *Action 11 Dodder Greenway extension - Given that the project level details for this scheme are as yet not available and the presence of a hydrological pathway between this watercourse and North Dublin Bay SAC and North Bull Island SPA the potential for likely significant effects to a number of European Sites at Dublin Bay cannot be ruled out:*									

RESOURCE MANAGEMENT

	RESOURCE MANAGEMENT									
	WASTE MANAGEMENT									

	RESOURCE MANAGEMENT									
1	Monitor and enforce waste regulation	↑	↑	↑	↑	↑	↑	↑	↑	↑
2	Assess waste in Council buildings and plan actions	↑	↑	↑	↑	↑	↑	↑	↑	↑
3	Run staff recycling awareness campaign	O	↑	O	O	↑	↑	O	O	↑
4	Identify areas in need of civic amenity sites and waste transfer stations	O	↑	O	O	↑		O	O	↑
5	Apply for LAPN (Local Authority Prevention Network) grants	O	↑	O	O	↑	↑	O	O	↑
6	Create Stop Food Waste campaign for businesses and schools	O	↑	O	O	↑	↑	O	O	↑
7	Promote Reuse Month	↑	↑	↑	↑	↑	↑	↑	↑	↑

	RESOURCE MANAGEMENT									
	annually									
8	Use Eco-Merit programme to advise businesses on reducing waste	↑	↑	↑	↑	↑	↑	↑	↑	↑
9	Promote recycling to householders through a range of workshops, talks and programmes	↑	↑	↑	↑	↑	↑	↑	↑	↑
10	Continue to work with the Rediscovery Centre to promote sustainability	↑	↑	↑	↑	↑	↑	↑	↑	↑
11	Research and implement sustainable procurement guidelines	↑	↑	↑	↑	↑	↑	↑	↑	↑
	LITTER & RECYCLING IN PUBLIC REALM	↑	↑	↑	↑	↑	↑	↑	↑	↑

	RESOURCE MANAGEMENT									
12	Run anti-dumping and anti-litter campaigns	↑	↑	↑	↑	↑	↑	↑	↑	↑
13	Organise Marine Litter clean up days	↑	↑	↑	↑	↑	↑	↑	↑	↑
14	Solar Compactor Bins provided in City -	↑	↑	↑	↑	↑	↑	↑	↑	↑
15	Mapping and tagging of City bins	↑	↑	↑	↑	↑	↑	↑	↑	↑
16	Identify areas in need of recycling infrastructure	↑	↑	↑	↑	↑	↑	↑	↑	↑
17	Develop pilot projects for recycling	↑	↑	↑	↑	↑	↑	↑	↑	↑
18	Engage with relevant stakeholders and deliver an energy efficiency, circular economy and sustainability training	↑	↑			↑	↑	↑	↑	↑

	RESOURCE MANAGEMENT									
	programme targeting micro and small enterprises									
19	Investigate introducing a leaf composting programme across the City	↑	↑	↑	↑	↑	↑	↑	↑	↑
20	Support and promote Tidy Towns/ Green Schools/ City Neighbourhoods initiatives	↑	↑	↑	↑	↑	↑	↑	↑	↑
21	Develop sustainability guidelines and terms and conditions for any events supported, facilitated or organised by DCC	↑	↑	↑	↑	↑	↑	↑	↑	↑
22	Review terms and conditions for all events approved by DCC to incorporate possible	↑	↑	↑	↑	↑	↑	↑	↑	↑

	RESOURCE MANAGEMENT									
	sustainability conditions									
23	Any events supported, facilitated or organised by DCC will not permit balloon or Chinese lantern releases	↑	↑	↑	↑	↑	↑	↑	↑	↑
24	DCC to consult with the events industry on alternatives to non-compostable single use food and beverage containers	↑	↑	↑	↑	↑	↑	↑	↑	↑
25	DCC to select an appropriate event as a pilot to trial alternatives to non-compostable single use food and beverage containers	↑	↑	↑	↑	↑	↑	↑	↑	↑
26	Phase out the use of single use plastic cups from all DCC canteens	↑	↑	↑	↑	↑	↑	↑	↑	↑

	RESOURCE MANAGEMENT									
	and replace with the use of ceramic cups and personal reusable cups									
27	Identify pilot locations for water access points	↑	↑	↑	↑	↑	↑	↑	↑	↑
28	Host and select sites for the Composting Demonstration using Master Composter EPA Stop Food Waste Programme or similar programme to assist sustainable gardening and management of landscaping waste	↑	↑	↑	↑	↑	↑	↑	↑	↑
29	Continue to investigate best practice in street recycling facilities	↑	↑	↑	↑	↑	↑		↑	↑
	WATER CONSERVATION									

	RESOURCE MANAGEMENT									
30	Implement water conservation campaign in civic buildings		↑	↑	↑	↑	↑			
31	Develop and implement an education programme to tackle climate issues related to the water sector	↑	↑	↑	↑	↑	↑	↑	↑	↑
	RESOURCE MANAGEMENT									
32	*Green street cleaning; use biodegradable cleaning agents*	↑	↑	↑	↑	↑	↑	↑	↑	↑
33	*Develop sustainable construction waste policy*	↑	↑	↑	↑	↑	↑	↑	↑	↑
34	*Trial of low flush toilets in Council headquarters and social housing*		↑		↑	↑				↑

	RESOURCE MANAGEMENT									
35	*Research feasibility of rainwater harvesting in Council buildings and social housing*	↑	↑	↑	↑	↑	↑	↑	↑	↑

Comment:

Again most of the measures are consistent with the SEOs in particular material assets, population and human health, climatic change and air quality.

For several SEOS the indirect and long term effects are positive, for example the water conservation measures.

Actions that address illegal dumping and potential reuse of emissions from landfills generate positive effects as a reduction in illegal dumping creates long term positive effects on soil and geology, water and biodiversity, as well as Landscape and Population. In turn an indirect positive effect may relate to accidental introduction of invasive species both through illegal dumping from construction or industry or plastic rubbish which has been identified as a vector for invasive species through water bodies.

ANNEX B: REVIEW OF PLANS AND PROGRAMMES

International Level

Title	Summary
Sustainable Development	
UN convention of Biological Diversity, 1992	The UN convention of Biological diversity was opened for signature at the Earth Summit in Rio de Janeiro on 5 June 1992 and entered into force on 29 December 1993. To date, there are 193 Parties signed up. The CBD is often seen as the key international instrument for sustainable development. The Ecosystem Approach, an integrated strategy for the management of resources, is the framework for action under the Convention.
EU Environmental Action Programme to 2020	The 7th EU Environmental Action Programme is more strategic in nature and identifies three main areas to guide EU environmental policy and research. The three thematic priority objectives are intended to: • Protect nature and strengthen ecological resilience • Boost sustainable resource-efficient low-carbon growth, and • Effectively address environment-related threats to health.
Environmental Assessment	
SEA Directive - Assessment of the effects of certain plans and programmes on the Environment, (2001/42/EC) 2001	This Directive requires plan-makers to carry out an assessment of the likely significant environmental effects of implementing a plan or programme before the plan or programme is adopted.
Environmental Impact Assessment Directive (85/337/EEC) .	The EIA Directive (85/337/EEC) came into force in 1985 and applies to a wide range of defined public and private projects, which are defined in Annexes I and II of the Directive. This has been amended with Directive 2011/92/EU and the 2014 Directive (see below).
Environmental Impact Assessment Directive (2014/52/EC)	It is necessary to amend Directive 2011/92/EU in order to strengthen the quality of the environmental impact assessment procedure, align that procedure with the principles of smart regulation and enhance coherence and synergies with other Union legislation and policies, as well as strategies and policies developed by Member States in areas of national competence. The Directive now applies from May 2017.
Biodiversity, Flora and Fauna	
UN Convention of	The Convention on Biological Diversity (CBD) entered into force in December 1993. It has 3 main objectives:

Title	Summary
Biological Diversity, 1992	1. The conservation of biological diversity. 2. The sustainable use of the components of biological diversity. 3. The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources.
The Convention on Wetlands of International Importance (The Ramsar Convention) 1971 and subsequent amendments	Protection and conservation of wetlands and habitats of importance to waterfowl
EU Biodiversity Strategy to 2020	In 2011 the European Commission adopted a new strategy to halt the loss of biodiversity and ecosystem services in the EU by 2020. There are six main targets, and 20 actions to help Europe reach its goal. The six targets cover: · Full implementation of EU nature legislation to protect biodiversity. · Better protection for ecosystems, and more use of green infrastructure. · More sustainable agriculture and forestry. · Better management of fish stocks. · Tighter controls on invasive alien species. · A bigger EU contribution to averting global biodiversity loss.
EU Directive on the Conservation of Wild Birds, (2009/147/EC) 1979. Known as the Birds Directive	This Directive ensures far-reaching protection for all of Europe's wild birds, identifying 194 species and sub-species among them as particularly threatened and in need of special conservation measures. Member States are required to designate Special Protection Areas (SPAs) for 194 particularly threatened species and all migratory bird species. SPAs are scientifically identified areas critical for the survival of the targeted species, such as wetlands. They are part of the Natura 2000 ecological network established under the Habitats Directive 92/43/EEC.
EU Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna, (92/43/EEC), 1992 known as the Habitats Directive	The main goal of the Directive is to promote the maintenance of biodiversity by requiring Member States to take measures to maintain, protect or restore natural habitats, animal and plant species to a favourable conservation status, introducing robust protection for those habitats and species of European importance. For Ireland, these habitats include raised bogs, active blanket bogs, turloughs, sand dunes, machair (flat sandy plains on the north and west coasts), heaths, lakes, rivers, woodlands, estuaries and sea inlets. The Directive provides for a network of protected sites known as The Natura 2000 network, which limits the extent and nature of development which may have a detrimental effect on the flora or fauna identified therein.
European Communities (Birds and Natural	These regulations consolidate the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats)(Control of Recreational Activities) Regulations 2010, as well as addressing transposition failures identified in the CJEU

Title	Summary
Habitats) Regulations 2011	judgements. Articles 6(1) and (2) of the Regulations require Member States to take appropriate conservation measures to maintain and restore habitats and species, for which a site has been designated, to a favourable conservation status. Furthermore the Regulations require Member States to avoid damaging activities that could significantly disturb these species or deteriorate the habitats of the protected species or habitat types. Under these regulations any plan or project likely to have a significant effect on a Natura 2000 site, either individually or in combination with other plans or projects, shall undergo an Appropriate Assessment to determine its implications for the site. The competent authorities can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site concerned. In exceptional circumstances, a plan or project may still be allowed to go ahead, in spite of a negative assessment, provided there are no alternative solutions and the plan or project is considered to be of overriding public interest.
Green Infrastructure Strategy	The European Commission in May 2013 adopted a Green Infrastructure Strategy, '*to promote the deployment of green infrastructure in the EU in urban and rural areas'*. This is a key step in implementing the EU 2020 Biodiversity Strategy and specifically Target 2 that requires that 'by 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15% of degraded ecosystems'. Green Infrastructure (GI) is contributing to all other targets of the EU Biodiversity strategy – in particular the full implementation of the Birds and Habitats Directive (target 1) – and to maintain and enhance biodiversity in the wider countryside and the marine environment (targets 3 and 4).
Population and Human Health	
The Stockholm Convention	The Stockholm Convention on Persistent Organic Pollutants is a global treaty to protect human health and the environment from chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the fatty tissue of humans and wildlife, and have adverse effects to human health or to the environment.
Several environmental parameters interact and impact on human health including water quality, infrastructure, air quality, soil, cultural heritage and landscape; the plans, policies and programmes associated with these are presented under thematic headings as appropriate.	
Geology and Soil	
EU Soil Thematic Strategy	In September 2006, the European Commission published the final Thematic Strategy for Soil Protection (COM(2006)231 final) and a proposal for a Directive establishing a framework for the protection of soil across the EU (COM(2006)232). The objective of the strategy is to protect and ensure the sustainable use of soil, based on the guiding principles of preserving soil functions, preventing further degradation and restoring degraded soils to a level of functionality consistent with current and intended use. Once adopted the European Soil Thematic

Title	Summary
	Strategy will guide and frame Ireland's approach to developing its own soil protection strategy.
Water Resources	
Water Framework Directive (2000/60/EC) as amended	The Water Framework Directive (WFD) was adopted in 2000 in an effort to establish a framework for the protection of waterbodies within the EU including: inland surface waters; groundwater; transitional waters; and coastal waters. The key aims of the WFD are: expanding the scope of water protection to all waters, surface waters and groundwater; achieving "good status" for all waters by a set deadline water management based on river basins; "combined approach" of emission limit values and quality standards. getting the prices right; getting the citizen involved more closely, and streamlining legislation. Its ultimate objective is to achieve "good ecological and chemical status" for all Community waters by 2015.
Floods Directive (2007/60/EC)	The Directive aims to establish a common framework for assessing and reducing the risk that floods within the European Union pose to human health, the environment, property and economic activity.
The Drinking Water Directive (DWD), (98/83/EC) 1998	This Directive is intended to protect human health by laying down healthiness and purity requirements which must be met by drinking water within the Community.
Groundwater Directive, (2006/118/EC) 2006	This directive establishes a regime which sets underground water quality standards and introduces measures to prevent or limit inputs of pollutants into groundwater.
EC Bathing Water Quality Directive, (2006/7/EC) 2006	This Directive strengthens the rules guaranteeing bathing water quality It supplements Directive 2000/60/EC on water protection and management. Each year, the Member States are required to identify the bathing waters in their territory and define the length of the bathing season. They shall establish monitoring at the location most used by bathers or where the risk of pollution is greatest.
Climate and Air Quality	
Paris (Climate Change) Agreement	The Paris Agreement is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC), dealing with greenhouse-gas-emissions mitigation, adaptation, and finance, starting in the year 2020.There are 197 parties signed to the agreement, The main aim is to reduce the impacts of climate change through setting emission reduction Plans & guidelines.

Title	Summary
Kyoto Protocol	The Protocol was initially adopted on 11 December 1997 in Kyoto, Japan, and entered into force on 16 February 2005. To date 191 states have signed and ratified the protocol. Following the Conference of Parties to the Climate Change Convention (COP) meeting in Copenhagen 2009, the EU revised its commitment to reducing greenhouse gases by increasing the target to 20% reduction on 1990 levels by 2020.
The Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive	The EU objective in relation to air quality is 'to achieve levels of air quality that do not result in unacceptable impacts on, and risks to, human health and the environment'.
Material Assets	
EU Directive on Waste, (2006/12/EC), 2006	This Directive requires EU States to publish waste management plans. It requires a system of permits and registrations to be put in place to authorise all waste management infrastructure, as well as setting down the basic requirements that need to be satisfied for these statutory authorisations to be issued.
EU Directive on Waste (2008/98/EC), 2008	This Directive establishes a legal framework for the treatment of waste within the Community. It aims at protecting the environment and human health through the prevention of the harmful effects of waste generation and waste management. The Directive requires Member States to take measures for the treatment of their waste in line with the following hierarchy which is listed in order of priority:· prevention;· preparing for reuse;· recycling;· other recovery, notably energy recovery;· disposal.
EU Urban Waste Water Treatment Directive (91/271/EEC), 1991	The aim of the Urban Waste Water Directive is to protect inland surface waters from the adverse effects of discharges of urban wastewater and discharge of certain biodegradable industrial waste water (particularly from the agro-food industry).
Directive 2009/28/EC on the promotion of the use of energy from renewable sources	Directive 2009/28/EC on the promotion of the use of energy from renewable sources establishes the basis for the achievement of the EU's 20% renewable energy target by 2020. Under the terms of the Directive, each Member State is set an individually binding renewable energy target, which will contribute to the achievement of the overall EU goal. Each Member State is required to adopt a national renewable energy action plan.
Cultural Heritage Archaeology and Built Heritage	
The World Heritage Convention	The World Heritage Convention was adopted by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in November 1972. The World Heritage Convention aims to promote cooperation among nations to protect heritage around the world that is of such outstanding universal value that its conservation is important for current and future generations.. The following sites are on the tentative list for World Heritage Site Designation in the county: Inis Cealtra and the Burren.
European Convention on	This Convention was ratified by Ireland in 1997 and as such the Planning Authority is legally bound by it. The aim of the Convention is to

Title	Summary
the Protection of the Archaeological Heritage, 1992 (The Valletta Convention)	'protect the archaeological heritage as a source of the European collective memory and as an instrument for historical and scientific study'. It requires that appropriate consideration be given to archaeological issues at all stages of the planning and development process.
Convention for the Protection of the Architectural Heritage of Europe, 1985 (Granada Convention)	Ratified by Ireland in 1997, the 1985 Convention for the Protection of the Architectural Heritage of Europe is intended to reinforce and promote policies for the conservation and enhancement of Europe's heritage. The Convention is dual purpose, involving the promotion of architectural heritage policies while fostering European-wide co-operation measures. Covering monuments, groups of buildings and sites of importance, the Convention requires a national inventory of architectural heritage to be developed. Legal protection measures must be established, with a system of formal authorisation required for works affecting protected sites and structures. Architectural heritage conservation considerations are required to feature in the Convention signatories' town and Regional planning processes.
Landscape	
The European Landscape Convention 2000	The 2000 European Landscape Convention, adopted in Florence (and was ratified by Ireland in 2002), requires a commitment to introduce policies on landscape protection and management. It promotes the protection, management and planning of EU landscapes as a response to European-wide concerns that the quality and diversity of landscapes were deteriorating. The underlying purpose of the Convention is to encourage public authorities to adopt policies and measures at local, Regional, National and International level to protect and manage landscapes throughout Europe.
Other relevant conventions, plans, policies and programmes	
The Aarhus Convention	The Aarhus Convention establishes a number of rights of the public (individuals and their associations) with regard to the environment. The Parties to the Convention are required to make the necessary provisions so that public authorities (at national, regional or local level) will contribute to these rights to become effective.
Environmental Liability Directive 2004/35/EC	The overall objective of the Directive and the Regulations is to prevent and remedy environmental damage by holding operators whose activities have caused environmental damage financially liable for remedying the damage. The Environmental Liability Regulations 2008 define environmental damage under three categories: Damage to natural habitats and protected species - any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of European designated habitats or species (i.e. those covered by the Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC)). Water damage - damage which significantly adversely affects the ecological, chemical and/or quantitative status and/or ecological potential of waters covered in the Water Framework Directive (2000/60/EC). Land damage - any contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction in or under the land of

Title	Summary
	substances, preparations, organisms or micro-organisms.

National Level

Title	Summary
Sustainable Development	
Our Sustainable Future A framework for sustainable development in Ireland	Our Sustainable Future timeframe is to 2020 to tie in with other national and international frameworks, but a longer-term horizon to 2050 is also taken where appropriate, to provide a framework for guiding and reporting on long-term broad development trends such as on climate change.
Water Framework Directive River basin management plans 2018	On April 17th 2018 the Government published the River Basin Management Plan for Ireland 2018-2021. The Plan sets out the actions that Ireland will take to improve water quality and achieve 'good' ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2027.
National Mitigation plan	The National Mitigation Plan contains a series of mitigation measures and actions to address the immediate challenge of climate change to 2020 and to prepare for the EU targets that Ireland will take on for 2030. It will also begin the development of work to meet the objectives of the National Policy Position for 2050. The National Mitigation Plan covers greenhouse gas emissions in the Electricity Generation, Built Environment, Transport, and Agriculture, Forest and Land Use sectors, Environmental analysis was undertaken as part of the development of the Plan with appropriate assessment and environmental assessment taking place.
Sectoral Climate Adaptation Plans 2018	Sectoral Planning Guidelines for Climate Change Adaptation have been developed for, and are primarily intended for the use of, the sectors required to prepare statutory sectoral adaptation plans under the Framework(NAF). The guidelines aim to ensure that a coherent and consistent approach to adaptation planning is adopted by the key sectors in Ireland. With each specific region having a plan tailored to their specifics
Local Authority Adaptation strategy development Guidelines, EPA 2016	The guidelines are based on a staged and proportionate approach to adaptation planning and are structured around a 6-step planning cycle, these are: 1) Preparing the Ground; 2) Climate Impact Screening; 3) Prioritisation; Executive Summary - Sectoral Planning Guidelines for Climate Change Adaptation iii

Title	Summary
	4) Priority Impact Assessment; 5) Develop your Plan; 6) Implement, Evaluate and Review
The National Planning Framework 2040	Is a national document that will guide at a high-level strategic planning and development for the country over the next 20+ years, so that as the population grows, that growth is sustainable (in economic, social and environmental terms). Finalisation of the NPF alongside the ten-year National Development Plan will put together one plan to guide strategic development and infrastructure investment at national level. The NPF with the National Development Plan will also set the context for each of Ireland's three regional assemblies to develop their Regional Spatial and Economic Strategies taking account of and co-ordinating local authority County and City Development Plans in a manner that will ensure national, regional and local plans align.
Biodiversity, Flora and Fauna	
Actions for Biodiversity 2017 – 2021, Ireland's 3rd National Biodiversity Plan	The National Biodiversity Plan is intended to play a central part in Ireland's efforts to halt biodiversity loss and was developed as in line with the EU and International Biodiversity strategies and policies. It sets out the strategic objectives of the government in relation to biodiversity They include: 1. mainstreaming biodiversity across the decision making process in the State; 2. strengthening the knowledge base underpinning work on biodiversity issues; 3. increasing public awareness and participation; 4. ensuring conservation of biodiversity in the wider countryside; 5. ensuring conservation of biodiversity in the marine environment; 6. expanding and improving on the management of protected areas and protected species; 7. enhancing the contribution to international biodiversity issues.
Wildlife (Amendment) Act 2000	The Wildlife Act is Ireland's primary national legislation for the protection of wildlife. It covers a broad range of issues, from the designation of nature reserves, the protection of species, regulation of hunting and controls in wildlife trading. It is implemented by a series of regulations. The Act provides strict protection for nearly all birds, 22 other animal species, and 86 plant species. These species are protected from injury, or from disturbance / damage to their breeding or resting place wherever these occur. The 2000 Act was amended in 2010.
National Heritage Plan (2002)	The Department of Arts Heritage Gaeltacht and the Islands published the National Heritage Plan in April 2002. The plan sets out a vision for the management of the heritage of Ireland. A key element of the process of formulating the National Heritage Plan is the requirement to prepare

Title	Summary
	Local Heritage Plans at County and City level.
All Ireland Pollinator Plan 2015-2020	The All-Ireland Pollinator Plan: A shared plan of action has been developed by a fifteen member steering group and identifies 81 actions across five objectives. Sixty-eight partner organisations from both public, private and NGO sectors have supported the Plan, with responsibility for delivering the 81 actions shared out between these organisations. It is a voluntary Plan. The Pollinator Plan has 5 key objectives: 1. Making Ireland pollinator friendly (farmland, public land & private land) 2. Raising awareness of pollinators and how to protect them 3. Managed pollinators – supporting beekeepers and growers 4. Expanding our knowledge on pollinators and pollination service 5. Collecting evidence to track change and measure success
European Union (Invasive alien species) (Freshwater Crayfish) regulations 2018	The European Union (Invasive Alien Species) (Freshwater Crayfish) Regulations 2018 (SI 354/18) came into force on 18 September 2018. The new measures are designed to combat the threat of disease spread from several species of non-native crayfish. The new regulations will give Irish authorities the powers to prevent the arrival and spread of the five non-native species of crayfish included on the EU list of invasive alien species.
Irish waters Capital Investment programme	This is a plan by Irish water to develop and implement investment in improvements in drinking water quality, leakage, water availability, wastewater compliance, efficiencies and customer service across 380 projects around Ireland. The main objectives are 1. Eliminating Boil Water Notices in Roscommon 2. Providing more water and in particular reducing disruption to supply in the Dublin area 3. Improving Water Quality 4. Investing for economic development 5. Tackling leakage 6. Increasing wastewater treatment capacity and improving environmental compliance 7. Better Control and Monitoring 8. Improving existing plants
Irish waters Capital Investment programme 2017-2021 including forthcoming planning application for ring send	The capital investment programme outlines the number of projects being invested in across the country by Irish water. An application to upgrade the Ringsend WWTP has been commissioned the application seeks permission for works required to facilitate the use of Aerobic Granular Sludge (AGS) technology, to omit the previously permitted long sea outfall tunnel and to upgrade the sludge treatment facilities at Ringsend, Dublin 4, and to provide for a Regional Biosolids Storage Facility in Newtown, Dublin 11. Environmental impact assessment and appropriate assessment were both carried out on this project.

Title	Summary
WWTP upgrade	
Waterways Ireland Heritage Plan 2014-2020	The Waterways Ireland Heritage Plan provides, a strategic framework for the integration of built, natural and cultural heritage into the future management of the waterways of Ireland.
Population and Human Health	
Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (Cities, Towns & Villages)(2009)	The aim of these guidelines is to set out the key planning principles which should be reflected in development plans and local area plans, and which should guide the preparation and assessment of planning applications for residential development in urban areas.

Geology and Soil	
Geological Heritage Sites Designation (under the Wildlife Amendment Act 2000)	The Wildlife (Amendment) Act 2000 provides for designation of Natural Heritage Areas (NHAs) which will include geological sites. Until actually designated, there is no real protection for any important sites identified by GSI and recommended for NHA status. However, a number of geological features are protected because they are the underlying reason for a biological or ecological site protected as a National Nature Reserve, National Park or as a Special Area of Conservation (SAC). In addition many local authorities have scheduled County Geological Sites within their County Development Plans.
Water Resources	
National River Basin District Management Plan 2018	The National River Basin District Management Plan is now published (2018). The second cycle River Basin Management Plan aims to build on the progress made during the first cycle with a greater emphasis on ensuring the evidence base is available and the administration supports are fully in place to support key measures. The approach to the plan development involves characterisation of Ireland's water bodies in order to develop a tailored programme of measures to allow for the protection of good status or the restoration of good status for all water bodies. The outcomes are then monitored in order to feed into further characterisation and measures setting as the cycle moves forward. The plan was subject to SEA and Appropriate Asssesment.
Water Services Act (2007)	The Act sets down a comprehensive modern legislative code governing functions, standards, obligations and practice in relation to the planning, management, and delivery of water supply and waste water collection and treatment services. The Act focuses on management of water "in the pipe", as distinct from broader water resources issues such as river water quality, etc.
Water Services (Amendment) Act (2012)	The 2012 Act amends the 2007 Water Services Act in order to comply with a European Court of Justice ruling against Ireland in October 2009. The Court found that Ireland had failed to fulfil its obligations under the Waste Directive (75/442/EEC) regarding domestic waste waters

	disposed of through septic tanks and other individual waste water treatment systems. The new Part 4A requires each water services authority to establish and maintain a register of domestic waste water treatment systems situated within their functional area.
Irish Water Services Strategic Plan SEA and AA	The 25 year plan for strategic delivery of water services is currently being prepared and the SEA Scoping report was issued for consultation with a deadline in September 2014.
The Planning System and Flood Risk Management Guidelines (and Technical Appendices) for Planning Authorities (DoEHLG, OPW), 2009	In relation to planning at the County level the guidelines require planning authorities to: • introduce flood risk assessment as an integral and leading element of their development planning functions at the earliest practicable opportunity. • Align strategic flood risk assessment (SFRA)with the SEA process. • Establish flood risk assessment requirements as part of the preparation of the County Development Plan. • Assess planning applications against the guidance set out in the Guidelines. • Ensure development is not permitted in areas of flood risk except where there are no suitable alternative sites.
Climate and Air Quality	
National Adaptation Framework 2018	Ireland's first statutory National Adaptation Framework (NAF) was published in 2018. The NAF sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts. The NAF was developed under the Climate Action and Low Carbon Development Act 2015. The NAF builds on the work already carried out under the National Climate Change Adaptation Framework (NCCAF, 2012). The NAF outlines a whole of government and society approach to climate adaptation in Ireland. Under the NAF a number of Government Departments will be required to prepare sectoral adaptation plans in relation to a priority area that they are responsible for. Work on these plans will begin in 2018. Local authorities are required to prepare local adaptation strategies The NAF will be reviewed at least once every five years. The NAF also aims to improve the enabling environment for adaptation through ongoing engagement with civil society, the private sector and the research community.
National Climate Change Strategy (2007-2012)	The National Climate Change Strategy 2007 - 2012 sets out a range of measures, building on those already in place under the first National Climate Change Strategy (2000) to ensure Ireland reaches its target under the Kyoto Protocol. The Strategy provides a framework for action to reduce Ireland's greenhouse gas emissions
Review of Ireland's climate change policy and Climate Action and Low Carbon Bill	The National Economic and Social Council submitted a review of Ireland's climate change policy to the Minister of Environment in late 2012. The review includes the development of potential policies and measures to reduce greenhouse gas emissions in agriculture, transport, heat in buildings and renewable energy supply and a basis for a national transition to a low-carbon future by 2050.

2013	
Material Assets	
Smarter Travel, A Sustainable Transport Future, A New Transport Policy for Ireland 2009-2020	Smarter Travel is the transport policy for Ireland that sets out how the vision of a sustainable travel and transport system can be achieved.
Design Manual for Urban Roads and Streets 2013	Design Manual for Urban Roads and Streets incorporates good planning and design practice to support and encourage more sustainable travel patterns in urban areas.
Electric Vehicle Grant scheme and VRT relief	The electric Vehicle grant scheme is a government initiative to promote electric car use throughout the country. The scheme provides grants of up to 5,000 euro that are incentivised to promote electric and hybrid car use and thus reduce carbon emissions and is carried out through the SEAI . VRT or vehicle registration tax is a measure introduced to tax accordingly in relation to emissions produced by vehicle.
Spatial Planning and National Roads Guidelines 2012	These guidelines set out planning policy considerations relating to development affecting national primary and secondary roads, including motorways and associated junctions, outside the 50-60 kmh speed limit zones for cities, towns and villages.
National Transport Strategy for Greater Dublin Area 2016-2023	The Transport Strategy for the Greater Dublin Area, 2016-2035 has been prepared and published by the National Transport Authority in accordance with Section 12 of the Dublin Transport Authority Act, 2008. It sets out how transport will be developed across the region, covering Dublin, Meath, Wicklow and Kildare, over the period of the strategy and has been approved by the Minister for Transport, Tourism and Sport in accordance with the relevant legislation
Cultural Heritage Archaeology and Built Heritage	
National Monuments Act 1930 with subsequent amendments	This is the primary legal protection to archaeology in Ireland and has been amended a number of times, most recently 2004.
Architectural Heritage Protection - Guidelines for Planning Authorities (2011)	The 2004 guidelines were reissued in 2011 following the transfer of architectural heritage protection functions to the Department of Arts, Heritage and the Gaeltacht. Part IV of the Planning and Development Acts 2000 – 2011 sets out the legislative provisions for the protection and conservation of our architectural heritage
National Inventory of Architectural Heritage (NIAH)	The National Inventory of Architectural Heritage (NIAH) is a state initiative under the administration of the Department of Arts, Heritage and the Gaeltacht. The purpose of the NIAH is to identify, record, and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. NIAH surveys provide the basis for the recommendations of the

	Minister to the planning authorities for the inclusion of particular structures in their Record of Protected Structures (RPS).
Planning policy statement 2015	This document sets out the outline for the future of planning in Ireland and the objectives and guidelines for the continued development of Irish planning. It is a non-statutory statement that's main objectives are to set out: (1) Key principles that it expects planning authorities, other public bodies and those that engage with the planning process will observe; and (2) High level priorities for the continued enhancement of the planning system in Ireland.
Green Low Carbon Agriculture Environment scheme (GLAS)	The Green, Low-Carbon Agri-Environment Scheme is part of the Rural Development Programme 2014-2020. It provides funding to farmers in return for delivering environmental management on their land. Farmers must commit to the scheme for a minimum period of 5 years. GLAS has a number of interlinked aims, which include: • Protecting agricultural land, its habitats and biodiversity • Promoting environmentally sustainable methods of farming • Addressing issues of climate change mitigation, water quality and the preservation of habitats and species • Maintaining features such as traditional drystone walls and hedgerow The overall target for GLAS is to attract 50,000 farmers into the new scheme over its lifetime
Landscape	
A National Landscape Strategy for Ireland –2015	The Department of Arts, Heritage and the Gaeltacht has issued A National Landscape Strategy for Ireland which sets out objectives and principles in the context of a proposed National Landscape Strategy for Ireland.
Draft Landscape and Landscape Assessment Guidelines, (2000)	These Guidelines attempt to approach landscape appraisal in a systematic manner and recommend Landscape Character Assessment (LCA) as the method for assessment. LCA involves the characterisation of landscape based primarily on landcover (trees, vegetation, water etc.) and secondly on the value (i.e. historical, cultural, etc.). LCA is intended to aid the development management process as it gives indicators of development types which would be suited to certain locations using certain design criteria and consequently the character of the landscape remains intact.
National Cycle Policy Framework 2009-2020	The Government's 2009-2020 National Cycle Policy Framework. ... It outlined 19 high level objectives and detailed the 109 individual but integrated actions, aimed at ensuring that a strong cycling culture is developed in Ireland so that by 2020 10% of all journeys will be by bike,
National Transport authority Permeability best practice guide	The National transport Authority NTA published this guide in 2015. The document outlines how Dublin can improve and implement better walking and cycling throughout the city. Permeability, for the purpose of this guidance, describes the extent to which an urban area permits the movement of people by walking or s such, the Authority, in collaboration with South Dublin County Council and AECOM, has developed this policy guidance on how best to facilitate demand for walking and cycling in existing built-up areas.
Public Transport Act 2016	An Act to amend and extend the Dublin Transport Authority Act 2008 , the Taxi Regulation Act 2013 and the Railway Safety Act 2005 , section 66 of the Transport (Railway Infrastructure) Act 2001 , to amend sections 27 and 27A of the State Airports Act 2004 and section 106 of the

	Road Traffic Act 1961 , to give the force of law to the Protocol of 3 June 1999 for the Modification of the Convention concerning International Carriage by Rail (COTIF) of 9 May 1980 (Protocol 1999) and to change the name of the Railway Safety Commission.
Planning and Development Act 2000 (as amended). **This Act consolidated all planning legislation from 1963 to 1999 and remains the basis for the Irish planning code, setting out the detail of regional planning guidelines, development plans and local area plans as well as the basic framework of the development management and consent system. Among other things, it provides the statutory basis for protecting our natural and architectural heritage, the carrying out of Environmental Impact Statements and the provision of social and affordable housing.** **There have been a number of changes to the legislation since 2000, the most significant of which are set out in The Planning and Development (Amendment) Act 2002 and the Housing (Miscellaneous Provisions) Act 2004, which made substantial changes to Part V of the Act.** **In addition, a suite of new planning policies are being prepared most notably the National Planning Framework due to be finalised first quarter of 2017 which will replace the National Spatial Strategy. Prior to this a non-statutory Planning Policy Statement was issued in 2015 establishing then key principles including the following:** **- No. 8. Planning will conserve and enhance the rich qualities of natural and cultural heritage of Ireland –** **No. 9. Planning will support the protection and enhancement of environmental quality.**	

County level

Title	Summary
Regional Planning Guidelines 2010-2020- to be replaced by Regional Economic and Spatial Strategies	The aim of the Regional Planning Guidelines (RPGs) is to provide a framework for long term strategic development of the Greater Dublin Region for the period 2010 – 2022 which is consistent with the National Spatial Strategy (NSS) 2002 – 2020 and which ensures the successful implementation of the NSS at regional, county and local level. A key aspect of the RPGs is integrating sustainable economic development with the protection and enhancement of the environment. The RPGs are influenced by a wide range of international, national and regional level plans, programmes and legislation and also establish a framework for other lower level plans and programmes.
Dublin City Development Plan 2016-2022	The Development Plan is a plan for Dublin City and as such the assessment has been limited geographically to activities occurring within the functional area of the Development Plan. The Development Plan will cover the period from 2016 up to 2022 It was subject to SEA and AA.
Dublin Bay Biosphere Biodiversity Conservation and Research Strategy 2016-2020	This document sets out the planned biodiversity conservation and related research actions of DBBP from 2016-2020. It aims, firstly, to provide a coordinated framework for biodiversity conservation and research activities to be undertaken by DBBP and, secondly, to provide clarity regarding these planned activities to all stakeholders within DBB. It builds on the themes and objectives set out in the Periodic Review of North Bull Island UNESCO Biosphere (DCC, 2014), which set out the following vision statement: "Our vision is to celebrate and promote a wider appreciation of the natural and cultural heritage of Dublin Bay, to capture the inherent passion of the community for the Biosphere concept and for the Dublin Bay

	Biosphere to be an exemplar for a new wave of Biospheres in the world network."
Eastern & Midland assembly regional spatial and economic strategy 2018	The Draft RSES is a strategic plan which identifies regional assets, opportunities and pressures and provides appropriate policy responses in the form of Regional Policy Objectives. At this strategic level it provides a framework for investment to better manage spatial planning and economic development throughout the Region. The Draft RSES provides a: • Spatial Strategy – to manage future growth and ensure the creation of healthy and attractive places to live, work, study, visit and invest in. • Economic Strategy – that builds on our strengths to sustain a strong economy and support the creation of quality jobs that ensure a good living standard for all. • Metropolitan Plan – to ensure a supply of strategic development areas for the sustainable growth and continued success and competitiveness of the Dublin metropolitan area. • Investment Framework – to prioritise the delivery of key enabling infrastructure and services by government and state agencies. • Climate Action Strategy – to accelerate climate action, ensure a clean and healthy environment and to promote sustainable transport and strategic green infrastructure.
Eastern-Midlands regional waste management plan 2015	The Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021 provides a framework for the prevention and management of waste in a sustainable manner in 12 local authority areas. The Eastern-Midlands Region comprises Dublin City Council, Dún Laoghaire-Rathdown, Fingal, South Dublin, Kildare, Louth, Laois, Longford, Meath, Offaly, Westmeath and Wicklow County Councils. The three key objectives of the Eastern-Midlands Region Waste Management Plan are: • Prevent waste: a reduction of one per cent per annum in the amount of household waste generated over the period of the plan. • More recycling: increase the recycle rate of domestic and commercial waste from 40 to 50 per cent by 2020. • Further reduce landfill: eliminate all unprocessed waste going to landfill from 2016.
Greater Dublin area Transport strategy 2016-2035	The Transport Strategy for the Greater Dublin Area, 2016-2035 has been prepared and published by the National Transport Authority in accordance with Section 12 of the Dublin Transport Authority Act, 2008. It sets out how transport will be developed across the region, covering Dublin, Meath, Wicklow and Kildare, over the period of the strategy and has been approved by the Minister for Transport, Tourism and Sport in accordance with the relevant legislation. Environmental assessment was carried out for this plan This transport strategy (Strategy) provides a framework for the planning and delivery of transport infrastructure and services in the Greater Dublin Area (GDA) over the next two decades. It

	also provides a transport planning policy around which other agencies involved in land use planning, environmental protection, and delivery of other infrastructure such as housing, water and power, can align their investment priorities.
Eastern Catchment Based Flood risk Management (CFRAM) study 2011-2016	The Eastern CFRAM study has been commissioned in order to meet the requirements of the Floods Directive, as well as to deliver on core components of the 2004 National Flood Policy, in the Eastern district. The main aims of the Eastern CFRAM Study are to • assess flood risk, through the identification of flood hazard areas and the associated impacts of flooding; • identify viable structural and non-structural measures and options for managing the flood risks for localised high-risk areas and within the catchment as a whole; • prepare a strategic Flood Risk Management Plan (FRMP) and associated Strategic Environmental Assessment (SEA) that sets out the measures and policies that should be pursued to achieve the most cost effective and sustainable management of flood risk; • ensure that full and thorough public and stakeholder consultation and engagement is achieved
Greater Dublin Strategic Drainage study	The Greater Dublin Strategic Drainage Study was commissioned in 2001 to carry out a strategic analysis of the existing foul and surface water systems in the local authority areas of Dublin City, Fingal, South Dublin, Dun Laoghaire Rathdown and the greater Dublin area. The study examined the new infrastructural requirements to 2031 in three-time frames: • The existing situation: - This examined drainage requirements for all development to year 2002, this year being the study baseline. • The short term situation:- This examined drainage requirements for all anticipated developments due for completion to year 2011 • The long term situation: - This identified the broad drainage requirements to cater for anticipated and/or assumed development in the Greater Dublin Region to year 2031.