



# NATURE-BASED SOLUTIONS

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## OVERVIEW

**54** PUBLIC PARKS MAINTAINED  
BY DUBLIN CITY COUNCIL

**300 km<sup>2</sup>**  
DUBLIN BAY UNESCO BIOSPHERE

**10%** ESTIMATED  
AVERAGE TREE  
CANOPY COVER IN CITY



## TARGET



CONTINUOUS GREEN SPACE  
ALONG RIVERS

REDUCE AREA OF  
SOIL SEALING IN DUBLIN

PROTECTING NATIVE SPECIES,  
PARKS AND TREE COVER

## EXAMPLES OF MAIN ACTION TYPES

Implementing Biosphere  
Work Programme



Constructing wetland habitats  
in parks and city-wide

Green roofs on  
civic buildings



Developing the City's  
green infrastructure

Implementing action plans  
for conservation of species  
sensitive to climate change



Protecting, planting and  
maintaining trees across the City

## STAKEHOLDERS TO WORK WITH AND INFLUENCE

GOVERNMENT  
DEPARTMENTS

ENVIRONMENTAL  
GROUPS

DUBLIN BAY UNESCO  
BIOSPHERE PARTNERSHIP

COMMUNITY  
GROUPS

GENERAL  
PUBLIC

SCHOOLS AND  
THIRD LEVEL INSTITUTIONS



**“A green city is a healthy city. Protecting and enhancing open spaces for both biodiversity and recreational use has benefits for the city’s sustainability and attractiveness as a place to live, work and visit. As Dublin city intensifies and consolidates some natural assets, open spaces and recreational areas may come under increased pressure. The City Council must respond by balancing the need of the city to consolidate with the need to protect and enhance vulnerable natural areas.**

- Dublin City Development Plan 2016-2022

Nature-based solutions are defined by the International Union for Conservation of Nature as “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits”<sup>[30]</sup>.

Nature-based solutions are critical in climate change adaptation; they can play an important role not only for biodiversity and ecosystems, flood prevention and carbon sequestration, but also in temperature regulation, water quality, erosion prevention, and filtering pollutants from the air and water. Nature-based solutions are used in a smart, ‘engineered’ way to provide sustainable, cost-effective, and adaptable measures that support climate resilience.

Examples of nature-based solutions currently deployed as ecosystem services within the City include green roofs and tree pits as part of sustainable urban drainage systems (SuDS), constructed wetlands to improve water quality and prevent flash flooding, increased biodiversity, and more tree canopy cover to regulate urban heat, improve air quality and provide shade and corridors for movement of wildlife within the City.

## GREEN INFRASTRUCTURE AND NATURE CONSERVATION

**“Green infrastructure is an interconnected network of green space that conserves natural ecosystem values and functions that also provides associated benefits to the human population. It is a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. It incorporates green spaces (or blue if aquatic ecosystems are concerned) and other physical features in terrestrial (including coastal) and marine areas.**

- Dublin City Development Plan 2016-2022

### Dublin City Council Biodiversity Action Plan 2015-2020

The overarching aim of DCC’s *Biodiversity Action Plan 2015-2020* is the conservation of biodiversity within the City using a combination of different approaches including direct and appropriate management of biodiversity at a local and regional level, identification and protection of important conservation value areas, enhancing biodiversity conservation within the green infrastructure network, raising biodiversity awareness and facilitating public behaviour towards increased protection and appreciation of nature and wildlife.

### Dublin’s Natural Capital

Dublin City Council is responsible for 54 public parks (not including the Phoenix Park, St Stephen’s Green, the Iveagh Gardens, the War Memorial Gardens, and the Botanic Gardens, which are all operated by the OPW) that it will protect to ensure that future generations can enjoy the benefits these amenities offer in terms of recreation, health and well-being. The flora and fauna in Dublin are vital in adapting to climate change and mitigating future impacts, as they act as carbon sinks and provide flood protection.

The biodiversity of Dublin City includes:

- Wildlife and habitats found at North Bull Island and along the City’s coastline
- The rivers and canals that cross the City
- Open spaces linked to historic, educational and other public buildings
- Roadsides, railway tracks, and footpaths
- Residential ‘greens’, private gardens, walls and buildings



## TREE MANAGEMENT

**“ The Tree Strategy provides the vision and direction for long-term planning, planting, protection and maintenance of trees, hedgerows and woodlands within Dublin City.**

- Dublin City Development Plan 2016-2022

Trees have multiple benefits in reducing the risk of climate change impacts. Through their root systems they reduce soil erosion, and sequester atmospheric carbon as part of the carbon cycle, meaning that over its lifetime, a single tree can absorb several tonnes of atmospheric carbon dioxide. The right tree in the right place can provide shelter from both wind and sun and help to reduce the urban heat island effect. The *Tree Canopy Study* carried out by UCD's School of Geography has highlighted that in Dublin City, where 97% of the land is built up, trees cover just 10.2% of the total area; this can be as low as 3% for some urban areas<sup>[31]</sup>. In response to this study, DCC is actively working to increase its canopy cover by implementing the City's Tree Strategy. DCC's policy will involve not only the planting of more trees, but also their ongoing maintenance and care, as it is important to identify ageing and diseased trees to maintain and improve canopy cover in the City and to reduce storm related damage.

### CASE STUDY



Photo Source: Fáilte Ireland / Matthew Thompson

#### Tree Promotion Initiatives

The Native Tree Trails programme was developed by DCC Parks and Landscape Services in 2008 and includes at least one programme in each electoral area. DCC also supports further tree planting activities with schools including the annual National Tree Week and National Tree Day in cooperation with the Tree Council of Ireland. DCC further supports tree-planting with businesses for corporate social responsibility initiatives.

## SuDS AND WATER-BASED SOLUTIONS

**“ SuDS reduces flood risk, improves water quality and provides amenity through the use of permeable paving, swales, green roofs, rainwater harvesting, detention basins, ponds and wetlands. Furthermore, SuDS offer the opportunity to combine water management with green space, which can increase amenity and biodiversity. Dublin City Council will carry out on-going maintenance and monitoring of the sustainable drainage systems within the public domain.**

- Dublin City Development Plan 2016-2022

### Water related nature-based solutions

Wetlands, floodplains, lakes, rivers and reservoir ecosystems play an important role in the regulation of floods in inland systems. They also provide protection from the adverse consequences of climate related flood risks by acting as 'storage' or buffers during extreme precipitation events. They also play a role in temperature regulation and are home to a rich biodiversity of flora and fauna.

Coastal regions are both vulnerable to and vital to climate change risk. Again, these areas can act as buffer zones for maritime-related climate change impacts, such as storm surges, rising sea levels and pressure on tidal rivers. DCC has developed a range of plans and strategies to protect these areas and its biodiversity. As Dublin's natural ecosystems have a critical role in the international migration of various bird species, it is important to protect and conserve these habitats. The expansion of the Dublin Bay UNESCO Biosphere area to include the area between Howth Head and Dalkey will further protect the biosphere's varied ecological systems. This is an opportunity for Dublin to be a world leader in biodiversity management in the urban context.



### Dublin Bay UNESCO Biosphere

In 1981, UNESCO recognised the importance of Dublin Bay by designating North Bull Island as a biosphere because of its rare and internationally important habitats and species of wildlife. UNESCO's concept of a biosphere has evolved to include not just areas of ecological value, but also the areas around them and the communities that live and work within these areas. There have since been additional international and national designations, covering much of Dublin Bay, to ensure the protection of its water quality and biodiversity.

In 2015, the existing North Bull Island UNESCO Biosphere was expanded to cover all of Dublin Bay, an area of 300 km<sup>2</sup> with a population of 300,000 people. This includes a core area of high biodiversity value such as North Bull Island, the Baldoyle and Tolka Estuaries, Booterstown Marsh, Howth Head, Dalkey Island and Ireland's Eye.

The Dublin Bay UNESCO Biosphere contains three different zones, which are managed in different ways:

- The core zone of the Dublin Bay UNESCO Biosphere comprises of 50 km<sup>2</sup> of areas of high natural value, including Howth Head, North Bull Island, Dalkey Island and Ireland's Eye
- The buffer zone comprises 82 km<sup>2</sup> of public and private green spaces that surround and adjoin the core zones
- The transition zone comprises 173 km<sup>2</sup> and forms the outer part of the biosphere. It includes residential areas, harbours, ports and industrial and commercial areas.

### Tolka River Valley Greenway

The Tolka River Valley Park is a part of the Strategic Green Network of Dublin City. The parkland is multi-functional and accommodates playing pitches, pitch and putt, cycling, access for angling and riverside walks, which will now be extended by 2.4km. To enhance habitat diversity, the new wetland ponds will be planted with aquatic and marginal vegetation, new hedgerows, thousands of trees and seven hectares of wildflower meadow will be established. The new wetlands will take the surface water from roads, trap pollutants and treat it before it enters the river. The Tolka Valley is considered an exemplar of green infrastructure planning as a multi-disciplinary and multi-agency design and management process. The success of the Tolka Valley Project is clearly illustrated by the recording in 2011 of numbers of juvenile wild Atlantic salmon in the river at Glasnevin and Finglas, the first record of wild salmon (which only survives in clean water) in the Tolka for at least 100 years.



# NATURE-BASED SOLUTIONS



NO	ACTION	TIMEFRAME	LEAD DEPT(S)	INDICATORS	TARGET(S) IMPACTED
<b>ACTIONS CURRENTLY BUDGETED</b>					
<b>OPERATIONS</b>					
1	Establish regional working group on nature-based solutions	2019 onwards	Culture, Recreation and Economic Services	Working group established	
2	Agree joint action plans to protect native habitats and species across all 4 DLAs	2019	Culture, Recreation and Economic Services	Action plans agreed	
3	Establish a cross-departmental Trees and SuDS Working Group to promote and pilot water sensitive urban design incorporating urban tree planting	2019 onwards	Multi-departmental	Working group established	
4	Workshop on trees and SuDS	2019	Multi-departmental	Workshops held, report of outcomes	
5	Produce regional river basin management guidelines. Use Santry River as demonstration	Ongoing	Multi-departmental	Guidelines produced	
6	Facilitate an annual workshop for information exchange between biodiversity experts	2019 onwards	Culture, Recreation and Economic Services	Workshop organised	
7	Collect data to inform the preparation of a list of habitats and species in Dublin City vulnerable to climate change	Ongoing	Culture, Recreation and Economic Services	Data compiled	
<b>GREEN INFRASTRUCTURE</b>					
8	Develop Green Infrastructure Strategy for region	2021	Culture, Recreation and Economic Services	Strategy completed	
9	Implement Public Open Space and Parks Strategy	Ongoing	Culture, Recreation and Economic Services	Strategy completed	
10	Map access to green space in City to identify areas of need	Ongoing	Culture, Recreation and Economic Services	Spaces mapped, areas identified	
11	Continued development of the Dodder Greenway	Ongoing	Culture, Recreation and Economic Services	Greenway completed, any habitats remediated	
12	Assess the feasibility of green walls	2019	Culture, Recreation and Economic Services	Report complete	
<b>TREE MANAGEMENT</b>					
13	Implement <i>Dublin City Tree Strategy</i>	Ongoing	Culture, Recreation and Economic Services	Completion of guide	



NO	ACTION	TIMEFRAME	LEAD DEPT(S)	INDICATORS	TARGET(S) IMPACTED
14	Continue to map and collect data on trees in Dublin City	Ongoing	Culture, Recreation and Economic Services	Data mapped and collected	
15	Promote and expand Native Tree Trails programme	Ongoing	Culture, Recreation and Economic Services	# of tree trails	
16	Produce guidance on species of public trees for urban planting in accordance with Action 3.1 of the <i>Dublin City Tree Strategy</i>	2019	Culture, Recreation and Economic Services	Guide produced	
17	Tree-planting activities with schools including annual National Tree Week and National Tree Day	Ongoing	Culture, Recreation and Economic Services	# of trees planted	
18	Investigate the use of the DAFM NeighbourWood Planting scheme for use in suitable urban area as part of the DCC Tree Strategy	2019	Culture, Recreation and Economic Services	Report complete	

## NATURE CONSERVATION

19	Implement <i>Dublin City Council Invasive Alien Species Action Plan</i>	2020	Culture, Recreation and Economic Services	Plan completed and reviewed, any eradication achieved	
20	Promote international World Wetlands Day	Annually	Culture, Recreation and Economic Services	Event organised	
21	Provide data to RAMSAR	Ongoing	Culture, Recreation and Economic Services	Data submitted	
22	Prepare and publish <i>Flora of Bull Island</i>	2020	Culture, Recreation and Economic Services, Dublin Naturalists Field Club	Book published	
23	Conduct a common cord-grass management study and monitoring for North Bull Island SPA	2019	Culture, Recreation and Economic Services, FCC, NPWS	Study conducted	
24	Prepare a GIS-based ecological sensitivity map of Dublin Bay Biosphere	2020	Culture, Recreation and Economic Services	Map complete	
25	Participate in the INTERREG-funded Acclimatize research project	2021	Culture, Recreation and Economic Services	Project complete	
26	Conduct light-bellied brent goose roost survey	2021	Culture, Recreation and Economic Services	Survey complete	
27	Implement the North Bull Island Management Plan	Ongoing	Culture, Recreation and Economic Services	Plan implemented	

## ACTIONS AWAITING BUDGET

28	Pilot projects for green roofs on civic buildings	2020	Multi-departmental	# of pilots	
29	Develop demonstration sites to showcase nature-based solutions with existing land uses	2020	Culture, Recreation and Economic Services	# of sites developed	



NO	ACTION	TIMEFRAME	LEAD DEPT(S)	INDICATORS	TARGET(S) IMPACTED
30	North East Inner City Greening Strategy	Ongoing	Culture, Recreation and Economic Services	Strategy implemented	
31	Develop urban woodland strategy	2020	Culture, Recreation and Economic Services	Strategy developed	
32	Incorporate tree and shrub planting in all new Council housing developments	2019	Housing, City Architects	# of trees per new dwelling, # of shrubs per new dwelling	
33	Assess feasibility of urban orchards	2020	Culture, Recreation and Economic Services, Planning and Property Development	Feasibility report	
34	Produce A Guide to Sustainable Living in Dublin City	2018 onwards	Multi-departmental, Dublin Community Growers Association	Guide produced and available in libraries	
35	Identify sites suitable for community gardens for local food production	Ongoing	Multi-departmental, Dublin Community Growers Association	# of sites identified	
36	Assessment of causes and impacts of Ectocarpus brown algal growth in Dublin Bay	2023	Multi-departmental	Assessment complete and actions developed	
37	Prepare a preliminary list of species and habitats vulnerable to climate change for informing environmental impact assessments	2024	Culture, Recreation and Economic Services	List prepared	
38	Prepare an analysis of soil sealing in Dublin City to determine levels of permeability	2021	Multi-departmental	Analysis done	

## EXAMPLES OF RELEVANT LEGISLATION/POLICIES/GUIDANCE

- All-Ireland Pollinator Plan 2015-2020
- Dublin Bay Biosphere Biodiversity Conservation and Research Strategy 2016-2020
- Dublin City Biodiversity Action Plan 2015-2020
- 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)
- Dublin City Invasive Alien Species Action Plan 2016-2020
- Dublin City Tree Strategy 2016-2020
- Dublin Tree Canopy Study (2017)
- EU Biodiversity Strategy
- EU Birds Directive 2009/147/EC
- European Communities (Birds and Natural Habitats) Regulations 2011 S.I. 477 of 2011
- EU Environmental Impact Assessment Directive 2014/52/EU
- EU Habitats Directive 92/43/EEC
- EU (Planning and Development) (Environmental Impact Assessment) Regulations 2018 S.I. 296 of 2018
- EU (Invasive Alien Species) (Freshwater Crayfish) Regulations 2018
- EU Regulation on Invasive Alien Species - EU Regulation 1143/2014
- EU Strategy on Green Infrastructure 2013
- National Biodiversity Action Plan 2017-2021
- National Landscape Strategy for Ireland 2015-2025
- The Heart Of Dublin: City Centre Public Realm Masterplan 2016
- Water Framework Directive 2000/60/EC
- Wildlife (and Amendment) Acts 1976-2012