



Draft Dublin City Biodiversity Action Plan 2021-2025

Ireland ratified the United Nations Convention on Biological Diversity (1992) and is obliged to act to conserve biodiversity and prepare a National Biodiversity Action Plan (NBAP). The NBAP 2017-2021 requires that local authorities review and update their Biodiversity Action Plans.

Dublin City is rich in biodiversity of global importance, which includes the most designated site on the island of Ireland – the North Bull Island National Nature Reserve. Dublin Bay is also a UNESCO Biosphere Reserve for sustainable development to manage for the coexistence of nature and people.

The Draft Dublin City Biodiversity Action Plan 2021-2025 is the third such plan produced by Dublin City Council and follows on from the 2015-2020 and 2008-2012 plans. The Plan is based on five themes that focus the outcomes for biodiversity conservation required across the city: Maintaining Nature in the City; Restoring Nature in the City; Building for Biodiversity; Understanding Biodiversity in the City; and Partnering for Biodiversity. Within these themes, there are 17 objectives for biodiversity management and conservation along with a series of 85 targeted actions with measurable outcomes to achieve these objectives. Each theme links to the strategic objectives of the National Biodiversity Action Plan 2017-2021 while considering the urban context of biodiversity within Dublin. The Plan was developed in partnership with various organisations and includes a new focus on restoration of biodiversity in response to a public feedback and EU policy.

The Draft Dublin City Biodiversity Action Plan 2021-2025 was approved for public consultation at the Arts, Culture and Leisure Strategic Policy Committee on May 17th 2021. The review from the public consultation was subsequently presented to the Arts, Culture and Leisure Strategic Policy Committee on November 22nd, 2021. There were no issues raised by the Arts, Culture and Leisure Strategic Policy Committee and it was agreed to submit the final draft to the City Council in December 2021.

Resolution:

That Dublin City Council notes the contents of report 341/2021 and hereby adopts the Dublin City Biodiversity Action Plan 2021-2025.

Cllr. Cat O'Driscoll

Chairperson

26th November 2021

Dublin City

Biodiversity Action Plan

2021-2025



Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council

ACKNOWLEDGEMENTS

Dublin City Council would like to thank the participants on the Dublin City Biodiversity Action Plan Forum and stakeholders from various workshops for their contributions to the development of this Plan. We would also like to express our appreciation for the work and commitment of our partners and citizens in the implementation of the previous plan, which has informed this Plan.

This Plan has been prepared on behalf of Dublin City Council in collaboration with many organisations by: Maryann Harris, Senior Executive Parks and Landscape Officer (Biodiversity) and Lorraine Bull, Biodiversity Officer.

Front cover photographs: Anthony Woods

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Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA)

The Biodiversity Action Plan has been prepared in accordance with the requirements of the Planning and Development (Strategic Environmental Assessment) Regulations 2004 and Article 6 of the Habitats Directive 92/43/EEC. The SEA and AA process, carried out in tandem with the preparation of the Biodiversity Action Plan, have ensured full integration and consideration of environmental issues throughout the action plan preparation process.

The SEA Environmental Report and Screening Statement in support of the AA and Natura Impact Report are available as separate documents, to be read in conjunction with this Biodiversity Action Plan.

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1. Introduction to Biodiversity

1.1 Biodiversity and its importance

Biological Diversity or 'Biodiversity' is the variety and variability of all life on Earth - from the smallest microscopic organisms - right up to the giant mammals. Biodiversity includes the diversity within species, between species, and of ecosystems¹. It includes all aspects of nature, including us, and how everything is interdependent.

Biodiversity is the key indicator of the health of an ecosystemⁱ. Healthy biodiversity and ecosystems provide us with vital ecosystem services, including clean air and water, food, soil resources, medicines, and materials such as timber and cotton. Functioning ecosystems also help to mitigate against the impacts of climate change by helping to sequester carbon, reduce flooding and erosion, and protect us from extreme weather events.



A Common Hawker (*Aeshna juncea*) dragonfly at the ponds of Tolka Valley Park (Photo: Anthony Woods).

Research also supports the benefits that being out in nature has to our physical health and mental wellbeing. The World Health Organisation's (WHO) European Mental Health Planⁱⁱ, states actions under Healthy Places, Healthy Communities, to "*promote the establishment and protection of healthy places outdoors and contact with nature.*"

During the Covid-19 pandemic, people's awareness and appreciation of biodiversity significantly increased. The National Biodiversity Data Centre recorded a 60% increase in voluntary records being submitted compared to the same period in the previous year as '*People engaged more actively with nature during the Covid-19 lockdown*'ⁱⁱⁱ. In December 2020, Dublin City Council conducted a public survey questionnaire through the platform *Your Dublin Your Voice*, which revealed that 84% of respondents were familiar with and understood the term biodiversity, while 74% of respondents felt that biodiversity had become more important to them over the past 5 years and to their quality of life. The launch of the EU Biodiversity Strategy to 2030 links the recovery of biodiversity to recovery from economic recession, health threats and climate disasters "*We need nature in our lives*" is a central message. Investing in nature protection and restoration will also be critical for Europe's (and Dublin's) economic recovery from the COVID-19 crisis.

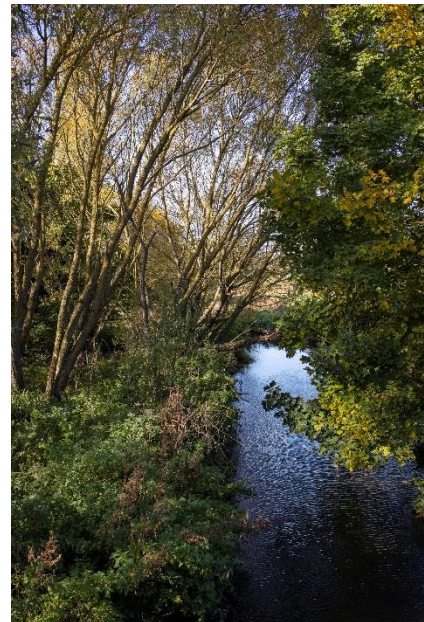
1.2 Threats to biodiversity

To keep ecosystem services effective, the biodiversity in them must remain healthy but although biodiversity awareness has increased, unfortunately so have the threats, which include:

- **Habitat Loss** – the removal of an area of habitat, for example, a hedgerow or an area of woodland. Once lost, the assemblage of species living in that habitat are displaced and even if the habitat is replaced, say with planting a new tree or hedgerow, it can take years to regain its original value. As well as direct removal, habitat loss can occur through insensitive management of areas. Land use change and urbanisation are key factors in habitat loss in Dublin.
- **Habitat fragmentation** – where large areas of habitat are broken up into smaller, fragmented areas that become isolated and reduce the resources available to a species. In the city, habitat fragmentation is a major concern for biodiversity as many species need to commute between areas to forage and rest, which in an urban environment can already be fragmented.
- **Climate Change** – which can cause changes in the habitat range of species and affect the species composition of habitats.
- **Pollution** – which includes pollution of the air; pollution of water and land through chemical usage and run off or littering; as well as light pollution, which can impact foraging and resting species.
- **Invasive Alien Species** – which is caused by the introduction of an animal or plant to an area it's not native to, and which causes damage to the environment, economy or human health. For example in Dublin, Japanese Knotweed and the American Mink.
- **Disturbance to wildlife** – which can be through construction, recreational or other activities, including allowing pets to chase or disturb wildlife.

Since the publication of the Dublin City Biodiversity Action Plan 2015-2020, several reports have highlighted the further decline in biodiversity. Ireland's Sixth National Report to the UN Convention on Biological Diversity^{iv} reported that 91% of protected habitats in Ireland are in poor or inadequate condition and more than 50% are declining, while 14% of species assessed were considered as endangered. On May 9th, 2019, Dáil Éireann declared a biodiversity crisis, making Ireland the second country to do so. Dublin City Council declared a biodiversity crisis for Dublin City on Oct 14th, 2019. The production and implementation of the Dublin City Biodiversity Action Plan 2021-2025 is a process that will provide a coordinated response to addressing this crisis within Dublin City.

Urban development along river corridors threatens rich habitats, such as these on the River Tolka (Photo: Anthony Woods).



2. The Biodiversity of Dublin City

Dublin City's geographical position, natural features, and man-made influences have all shaped the city's rich tapestry of biodiversity, which is of global, national, and local importance. Dublin City Council's administrative area (shown in Figure 1) includes the iconic North Bull Island National Nature Reserve (reviewed in Section 3.5.1, Case Study of North Bull Island), and Dublin Bay, which is designated a UNESCO Biosphere Reserve for sustainable development to manage for the coexistence of nature and people. These designated sites (shown in Section 2.2) form part of the European-wide Natura 2000 Network, which aims to 'ensure the long-term survival of Europe's most valuable and threatened species and habitats, listed under both the Birds Directive and the Habitats Directive'.^{iv}

In addition to legally designated sites, there are numerous habitats across the city that have conservation value for biodiversity. These include the city's public parks and open spaces, rivers, canals, and embankments (called riparian zones); along the city's railway tracks; in the city's graveyards and cemeteries; in residential streets and gardens; in walls and buildings, and in vacant brown field sites that provide scrubland for native wildlife. To help protect these areas, the Dublin City Biodiversity Action Plan 2021-2025 includes actions to survey and monitor these areas in addition to the designated sites.



Figure 1. Map of the Dublin City Council Administrative Area (Shaded Area).

2.1 Dublin City Habitat Map

Habitats are a place where a particular species has evolved to live. There are several habitat types in Dublin that have been analysed as part of the Dublin City Habitat Map (2020). Unexpectedly for an urban environment, built surfaces - buildings (17%), open sealed surfaces and roads (15%), ways, and other infrastructure (11%) - cover a combined area of 43% (Figure 2). In addition, active construction sites (bare soil and disturbed ground) cover 1.0%. The city's residential gardens comprise a key habitat (28%) of the area of the city and, therefore, have an important potential role in supporting biodiversity by providing areas of shelter and opportunities for feeding and dispersal. Natural and semi-natural habitat types are nearly the same total area of the city (27%). This comprises semi-improved grasslands (11%), semi-natural grasslands (5%), sparsely-wooded grasslands (3%), various woodland categories (5%), coastal habitats (2%) and freshwater habitats (rivers and ponds) (1%). Railway lines (classified as exposed sand, gravel, or till) cover 0.6% of the area, but along with freshwater habitats, provide important ecological corridors for biodiversity in the city.

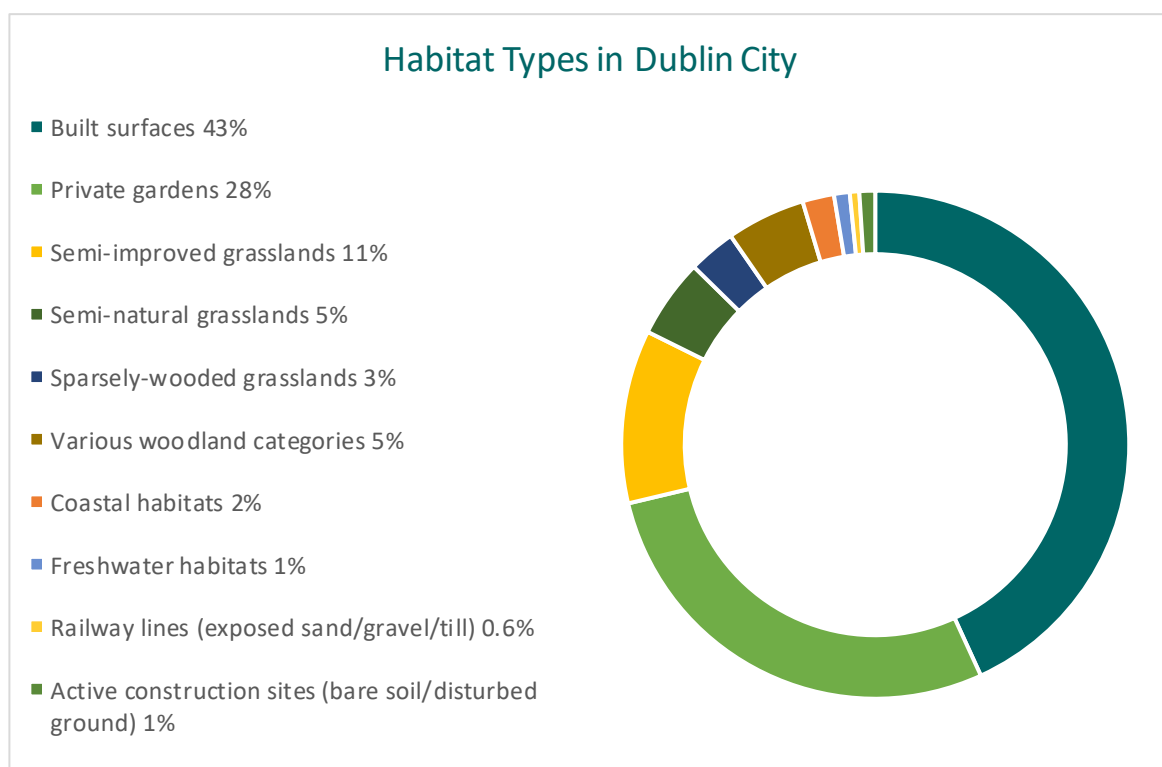


Figure 2. Overview of the percentage of Habitat Types from the Dublin City Habitat Map (2020).

The various woodlands can be further subdivided into broadleaved forest (3.0%), coniferous forest (<0.1%), mixed forest (0.7%), and scrub (1.0%). However, linear woodlands were not mapped separately and are classified as broadleaved forest. The city's coastal habitats are comprised of the sand dune systems (0.9%) and salt marshes (0.8%) of North Bull Island. As the administrative area of Dublin City does not include the tidal area of Dublin Bay, marine water bodies (0.1%) littoral habitats (sandy shores, shingle and gravel shores, muddy shores, and mixed sediment shores) have low coverage. Rivers (freshwater courses) and estuaries (inter-tidal water bodies) cover 0.6% and 0.3% of the area, respectively; while standing water (freshwater lakes, reservoirs, and artificial water bodies) covers 0.3%. The geographical distribution of these is shown in the Dublin City Habitat Map (2020) (Figure 3 and Appendix 4).

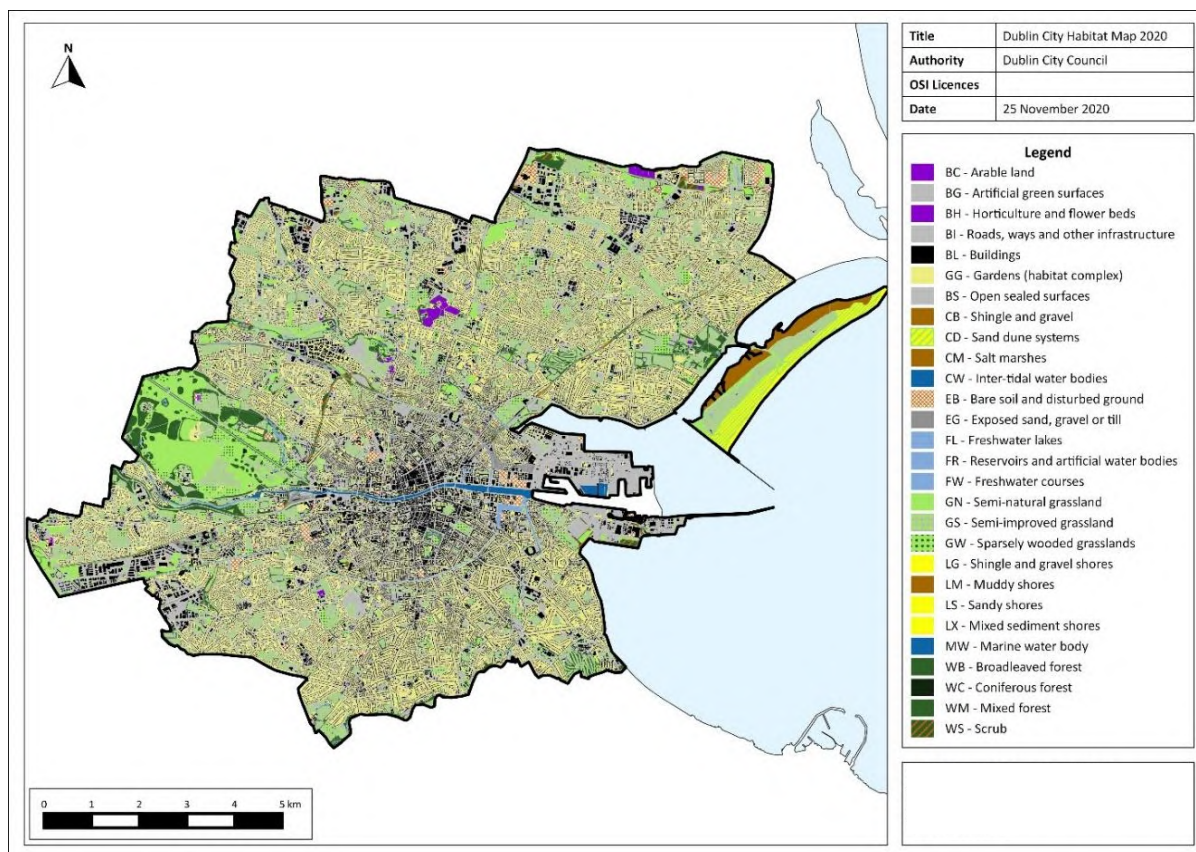


Figure 3. The Dublin City Habitat Map (2020).

2.2 Dublin City's Coastal Habitats

Dublin City's coastal areas support numerous habitats, flora, and fauna that are afforded legal protection under Irish and European legislation. These include North Dublin Bay (including North Bull Island) and South Dublin Bay that are designated as Special Areas of Conservation (SACs) due to the habitat types that are listed under Annex I of the EU Habitats Directive (Table 1) and Special Protection Areas (SPAs) under the EU Birds Directive. Combined, these areas cover most of Dublin Bay (Figure 4).

The marshes and shoreline of North Bull Island offer rich feeding grounds to nationally and internationally important bird populations. Thousands of migratory birds flock here each year from as far as Arctic Canada, Africa, and the Mediterranean. North Bull Island supports nine habitats and a range of species protected under the EU Habitats Directive, including rare and protected flora (reviewed in Section 3.5.1, Case Study of North Bull Island), the Marsh Fritillary Butterfly, several bat species, and Ireland's only reptile, the common lizard. Along Sandymount Strand in the South Dublin SAC, there are beds of *Zostera* (seagrass/eelgrass) that are regarded as a keystone community, which has considerable importance to the overall ecology and biodiversity of a habitat by virtue of its physical complexity (NPWS, 2013). These habitats serve as important nursery grounds for a variety of marine species and provide a vital food source for the Light-bellied Brent geese as they replenish their energy reserves after their long migration. These areas also support, and provide the opportunity for spotting, protected marine mammals, including Grey and Harbour seals that feed and haul out around the Bay; Harbour Porpoises that swim right up towards Dublin Port, and Bottlenose Dolphin that traverse the Bay.

Due to the importance of our coastal habitats, the Dublin City Biodiversity Action Plan 2021-2025 has a range of actions to monitor, conserve and restore these areas.

Table 1: List of Habitats Identified as Qualifying Interests for Special Areas of Conservation (SAC) within Dublin City Council and associated Annex I Habitat Codes and Actions in this Biodiversity Action Plan (BAP).

| Annex I Habitat Code | Qualifying Interest Habitat Name | North Dublin Bay SAC (Site code 000206) | South Dublin Bay SAC (Site code 000210) | Actions BAP |
|----------------------|---|---|---|---------------|
| 1140 | Mudflats and sandflats not covered by seawater at low tide | ✓ | ✓ | 2.1, 2.2, 2.4 |
| 1210 | Annual vegetation of drift lines | ✓ | ✓ | 2.1, 2.2, 2.4 |
| 1310 | Salicornia and other annuals colonising mud and sand | ✓ | ✓ | 2.1, 2.2, 2.4 |
| 1330 | Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) | ✓ | - | 2.1, 2.2 |
| 1395 | <i>Petalophyllum ralfsii</i> (Petalwort) | ✓ | - | 2.1, 2.2 |
| 1410 | Mediterranean salt meadows (<i>Juncetalia maritimi</i>) | ✓ | - | 2.1, 2.2 |
| 2110 | Embryonic shifting dunes | ✓ | ✓ | 2.1, 2.2, 2.4 |
| 2120 | Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) | ✓ | - | 2.1, 2.2 |
| 2130 | Fixed coastal dunes with herbaceous vegetation (grey dunes) * | ✓ | - | 2.1, 2.2 |
| 2190 | Humid dune slacks | ✓ | - | 2.1, 2.2 |

* indicates a priority habitat under the Habitats Directive

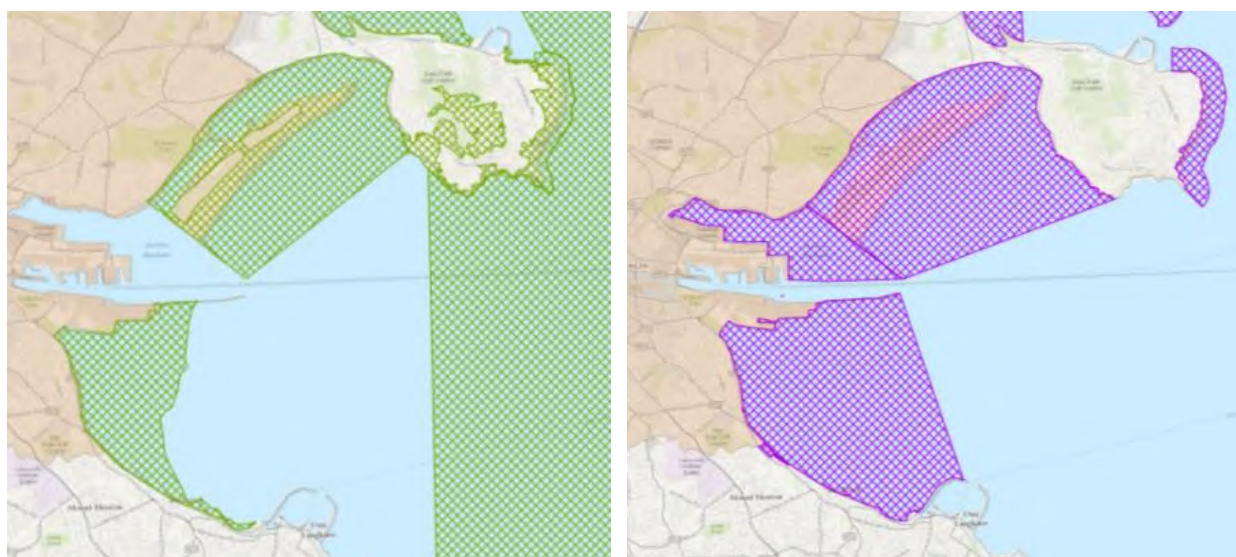


Figure 4. Left: Sites designated as Special Areas of Conservation (hatched in green) and Right: Sites designated as Special Protection Areas (hatched in purple).

2.3 Dublin City's Rivers and Canals

Dublin City has an extensive system of rivers, including the Liffey, Tolka, Dodder, Santry, Camac, Poddle and Mayne. These are modified by human action to some degree, although some natural watercourse sections remain. Since their construction in the early 19th Century, the Grand and Royal Canals have been a feature of the city, both of which are designated as proposed Natural Heritage Areas. These waterways form important ecological corridors for both aquatic and terrestrial species and allow for the dispersal of a range of flora and fauna, which is particularly vital in an urban environment. Several rare or protected fauna are associated with the rivers, including bat species, Otter - which has been recorded in 11 of the city's rivers, Kingfisher, and migratory fish. The River Liffey is the city's most important river for legally-protected fish species, supporting Atlantic Salmon, Brown Trout, the critically endangered European Eel, Brook and River Lamprey, and the endangered White-clawed crayfish. The Rivers Tolka, Dodder and Camac support Brown Trout, Atlantic Salmon, Lamprey species, and Eel; while the Camac and River Mayne also support the White-clawed crayfish and Eel respectively.

The habitats of the riverbanks (called riparian zones) contain broadleaved forest, scrub and semi-natural grasslands that support nesting birds, small mammals, and multiple invertebrate species. However, while many rivers are linked hydrologically by the River Liffey, the built-up nature of the riverbanks in urban areas is restricting terrestrial fauna from dispersing between the city's major rivers. At present, the city's railway lines are helping to connect these areas, and therefore, as part of this plan, there are river restoration actions and strategies to improve the wildlife corridors along the railway lines. The banks of the city's canals also provide important habitat, while the slow flow rate and relatively unpolluted waters of the canals has allowed the establishment of extensive benthic vegetation communities, including the protected Opposite-leaved Pondweed, Glutinous snail, and coarse fish species, including Pike, Rudd, Bream and Tench.

2.4 Dublin City's Public Parks

Dublin City has a network of over 200 public parks as well as green spaces that cover an area of approximately 1,400 hectares. The city's parks that are the most significant in terms of visitor numbers or tourist attractions are classed as Flagship Parks. Within Dublin City Council's administrative area there are 13 Flagship Parks. The Office of Public Works manages seven Flagship parks, including the Phoenix Park; the National Botanic Gardens; St. Stephen's Green; Iveagh Gardens; and the National War Memorial Gardens. Dublin City Council manages the remaining six flagship parks: North Bull Island; Father Collins Park; St. Anne's Park; Merrion Square Park; St. Patrick's Park; and Herbert Park, as well as the city's other parks, green spaces, and roadside verges.

Parks are key areas for biodiversity across the city and provide multiple habitats for legally-protected, and rare as well as common species. Surveys carried out during the previous Dublin City Biodiversity Action Plans 2008- 2020 has significantly increased our understanding of the importance of our parks for biodiversity, which has shaped changes in management regimes to increase areas of habitat and protect existing areas.

The range of woodland habitats, hedgerows, and shrub found in the city's parks (outlined in Sections 2.1.1) provide habitat and foraging opportunities for mammals, such as several bat species, badgers, foxes, hedgehogs, and pygmy shrews, numerous insects, and nesting and roosting sites for birds. Several city parks contain wetlands that support Common Newt, Common Frog, other aquatic

organisms, and waterfowl; or have rivers running through them that support riverine species (outlined in Section 2.3 and Table 5).



The City's parks also provide essential grassland habitats. In larger parks, such as the Phoenix Park, St. Anne's Park, and Tolka Valley Park, it is possible to have large grassland meadows. However, this combined with the network of smaller 'wild' areas that are created across all the city's parks, supports a range of rare and native flora, and endangered populations of pollinating insects. The amenity grasslands also provide valuable foraging habitat for protected bird species, such as the iconic Light-bellied Brent geese and oystercatcher that can be seen feeding on public playing pitches each winter.

Bee orchid (Photo: Anthony Woods).

Tables of the protected species found in Dublin City is outlined in Section 2.6.1 but some of the highlights of the legally-protected, rare, and common species that can be found across the city's parks include:

| | |
|-----------------------|--|
| Phoenix Park | Supports rare habitats including species-rich calcareous grassland, wet grassland, semi-natural woodland (0.5ha), and fringing wetland vegetation. 351 different plant species, 16 mammal species, and 72 bird species have been recorded. |
| St. Anne's Park | Supports Sparrowhawk, Bee Orchid, a heronry used by Little Egret and Grey Heron, bats, meadow grasslands, and pitches used by Light-bellied Brent geese |
| Bushy Park | Supports a heronry, Daubenton's bat, Kingfisher, Broad-leaved Helleborine, Common Newt and Moorhen, and rare flora and mature woodlands |
| Tolka Valley Park | Supports Daubenton's bat, Reed Bunting, Common Frog, and Banded Demoiselle Damselfly |
| Liffey Valley Park | Supports Flowering Rush, Rigid Hornwort, Ivy Broomrape and Green Figwort |
| Poppintree Park | Supports Delicate Stonewort, Linnet, Coot, and Common Frog |
| Irishtown Nature Park | Supports Pyramidal Orchid, Red-tailed Bumblebee, and a rare beetle, <i>Oedemera lurida</i> . |

The importance of the city's parks to our own health and wellbeing has also been highlighted over the past few years (see Section 1.1) and now more than ever the protection of these spaces is vital. As part of the ongoing strategy for the management of these parks for biodiversity, various monitoring programmes are part of this Plan to ensure the protection of these species and habitats.

2.5 Graveyards and Cemeteries

Dublin City has over eighty graveyards and cemeteries. In an urban environment, these have the potential to create oases for a range of biodiversity, both for common species - such as foxes, small mammals, birds, bats, and the Irish Yew - and for rare ferns, fungi, bryophytes (liverworts, hornworts, and mosses) and lichens (which are in fact two organisms that live symbiotically). Dublin has a long

history of importing different building materials, many of which act as substrates for lichen growth. However, lichen diversity is under-recorded in Dublin City, and therefore, this Plan includes an action for conducting surveys and implementing measures to conserve and enhance burial grounds as reserves for biodiversity.

Furthermore, older cities like Dublin contain remnant habitats of past landscapes that can host species which are now rare in its surrounding context. Some of these sites can act as “time capsules” for



wildlife, containing plants that reflect past industries or previous habitats, and fauna that remain from earlier times. These remnant habitats can be found in former demesnes which are now public parks or institutional lands, graveyards, gardens, old walls, undisturbed soil, old industrial sites, along watercourses and in archaeological sites that are relatively undisturbed.

St Canice's Graveyard, Finglas (Photo: Anthony Woods)

2.6 Protected Species

There are species in Dublin City for which there are not any specifically designated geographical areas or sites, but which are protected at European and national levels (Tables 2-7). Under Article 10 of the EU Habitats Directive, it is a legal requirement to protect the habitats for these species, wherever they may occur, in Dublin City. Article 10 states that:

“Member States shall endeavour, where they consider it necessary, in their land-use planning and development policies and, in particular, with the view to improving ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora. Such features are those which, by virtue of their linear and continuous structure (such as rivers with their banks or the traditional systems for marking field boundaries) or their function as steppingstones (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species.”

Article 10 promotes managing for connectivity of habitats. This is necessary to avoid habitat fragmentation and areas of habitat becoming too small, which can lead to the species dispersing to somewhere else (if they can) or becoming locally extinct. If ecosystems are managed in a network, then the small habitat areas support each other, and wildlife can move freely. An example of this is the corridors that residential gardens can provide if there are trees, hedges and shrubs planted along their boundaries.

The Dublin City Development Plan includes policies and objectives for green infrastructure to maintain and improve connectivity of habitats. It is particularly important to maintain the connectivity of habitats along hedgerows, rivers, and coastal areas, where many of our species of greatest conservation concern are found. Animals need movement for healthy populations to minimise inter-breeding. Fauna will also move out of protected areas to escape disturbance caused by humans or dogs, or to avoid predators or other animals that are competing with them for food. Even species for which there are designated sites, such as the birds of our Special Protection Areas, may rely upon

habitats within the wider area. For example, flocks of Light-bellied Brent geese can be seen feeding within public parks, sports, and school grounds when the supply of seagrass/eelgrass (*Zostera* spp.) runs out by the midwinter. These areas are crucial to allow birds to build energy reserves before their long journey back to the Canadian Arctic to breed.

Flora cannot of course simply move to escape threats and must be conserved if found in small sites outside of designated areas. Certain hedgerows in Dublin City are pre-Famine yet have no specific legal designations protecting them. Therefore, we must consider our land management practices outside of designated sites if we are truly committed to halting biodiversity loss.

2.6.1 Tables of protected species in Dublin City

Dublin City supports a range of fauna that are protected through European legislation under Annex II, IV, or V of the EU Habitats Directive and the Bern Convention, as well as national legislation through the Wildlife Acts (1976 to 2021) and the Fisheries Act (1959 to 2006). These are listed in Tables 2, 3, 5 and 6 below. Bird species that are listed under Annex I of the EU Birds Directive and some that are also identified as Special Conservation Interests of Dublin City's SPAs (for which the sites have been designated) of the North Bull Island SPA and the South Dublin Bay and River Tolka Estuary SPA are listed in Table 4 (below). Flora species protected under the Flora Protection Order are detailed in Table 7.

Table 2. Protected mammal species in Dublin City (excluding bats, which are listed in Table 3)

| Common name | Scientific name | Recorded in Dublin | Wildlife Acts | EU HD | Bern | Red Data Book | Habitat Description with Fossitt Habitat Codes* | Actions in this BAP |
|-----------------------|----------------------------------|---------------------------------------|---------------|--------|------|---------------|--|---------------------|
| Badger | <i>Meles meles</i> | Widespread | ✓ | - | III | LC | Cultivated land (BC), Built land (BL), Sand dune system (CD), Disturbed ground (ED), Highly modified/non-native woodland (WD), Linear woodland/scrub (WL), Semi-natural woodland (WN), Scrub/transitional woodland (WS). | 4.2, 11.1 |
| European Otter | <i>Lutra</i> | 11 rivers in Dublin & in canals | ✓ | II, IV | II | NT | Watercourses (FW), Littoral rock (LR). | 4.7, 8.2, 8.3 |
| Fallow Deer | <i>Dama dama</i> | Phoenix Park | ✓ | III | III | - | Improved grassland (GA), Semi-natural grassland (GS), Highly modified/non-native woodland (WD), Linear woodland/scrub (WL), Semi-natural woodland (WN). | - |
| Grey Seal | <i>Halichoerus grypus</i> | D. Bay, North Bull Isl. River Liffey. | ✓ | II, V | - | LC | Coastal construction (CC), Brackish water (CW), Marine water body (M) | 2.1, 2.3, 4.8, 4.10 |
| Harbour (Common) Seal | <i>Phoca vitulina</i> | D. Bay, North Bull Isl. River Liffey. | ✓ | II, IV | - | LC | Coastal construction (CC), Brackish water (CW), Marine water body (M). | 2.1, 2.3, 4.8, 4.10 |
| Harbour Porpoise* | <i>Phocoena</i> | D. Bay, North Bull Isl. River Liffey. | ✓ | II, IV | II | LC | Marine water body (M). | 2.1, 2.3, |
| Hedgehog | <i>Erinaceus europaeus</i> | Widespread | ✓ | - | II | LC | Highly modified/non-native woodland (WD), Linear woodland/scrub (WL), Semi-natural woodland (WN), Improved grassland (GA), Semi-natural grassland (GS). | 4.2, 4.3 |
| Irish hare | <i>Lepus timidus hibernicus</i> | Dublin North | ✓ | V(a) | III | | Found in a wide range of habitats | 4.2 |
| Irish Stoat | <i>Mustela erminea hibernica</i> | Bohernabreena | ✓ | - | III | LC | Highly modified/non-native woodland (WD), Linear woodland/scrub (WL), Semi-natural woodland (WN), Improved grassland (GA), Semi-natural grassland (GS). | 17.2 |
| Pine Marten | <i>Martes</i> | Bohernabreena | ✓ | V | III | LC | Highly modified/non-native woodland (WD), Semi-natural woodland (WN), Scrub/transitional woodland (WS). | 8.3 |
| Pygmy Shrew | <i>Sorex minutus</i> | Widespread | ✓ | - | III | LC | Highly modified/non-native woodland (WD), Linear woodland/scrub (WL), Semi-natural woodland (WN), Improved grassland (GA), Semi-natural grassland (GS). | 4.2 |
| Red Squirrel | <i>Sciurus vulgaris</i> | Bohernabreena | ✓ | - | III | LC | Highly modified/non-native woodland (WD), Semi-natural woodland (WN). | 8.3 |
| Sika Deer | <i>Cervus nippon</i> | Bohernabreena | ✓ | - | III | - | Highly modified/non-native woodland (WD), Semi-natural woodland (WN). | 17.2 |

EU HD = European Union Habitats Directive, Bern = The Bern Convention on the Conservation of European Wildlife and Natural Habitats, Wildlife Acts = Wildlife Acts (1976 to 2018) and Wildlife (Amendment) Act 2020, IUCN Red List Status: LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered. *Also projected under OSPAR – The Convention to Protect the Marine Environment of the North East Atlantic.

Table 3. Protected bat species in Dublin City

| Common name | Scientific name | Recorded in Dublin | Wildlife Acts | EU HD | Bern | Red Data Book | Habitat Description with Fossitt Habitat Codes* | Actions in this BAP |
|--------------------------------|------------------------------|-----------------------------|---------------|-------|------|---------------|--|---------------------------|
| Brown Long-Eared Bat | <i>Plecotus auritus</i> | Widespread | ✓ | IV | II | LC | Semi-natural woodland (WN), Highly modified non-native woodland (WD), Scrub / transitional woodland (WS), Linear woodland / scrub (WL), Scrub (WS1), Horticultural land (BC2), Stone walls and other stonework (BL1), Building and artificial surfaces (BL3), Riparian (WN5). ² | 4.5, 8.2, 8.3, 11.1, 16.1 |
| Common Pipistrelle Bat | <i>Pipistrellus</i> | Widespread | ✓ | IV | II | LC | Semi-natural woodland (WN), (Mixed) broadleaved woodland (WD1), Mixed broadleaved / conifer woodland (WD2), Stonewalls and other stonework (BL1), Building and artificial surfaces (BL3), Non-marine caves (EU1), Artificial underground habitats (EU2), Hedgerows (WL1). ¹ | 4.5, 8.2, 8.3, 11.1, 16.1 |
| Daubenton's Bat | <i>Myotis daubentonii</i> | Widespread | ✓ | IV | II | LC | Semi-natural woodland (WN), Highly modified non-native woodland (WD), Building and artificial surfaces (BL3), Lakes and Ponds (FL), Watercourses (FW). ¹ Roosts in crevices, mature trees & buildings near watercourses. | 4.5, 8.2, 8.3, 11.1, 16.1 |
| Leisler's (Lesser Noctule) Bat | <i>Nyctalus leisleri</i> | Widespread | ✓ | IV | II | LC | Semi-natural woodland (WN), (Mixed) broadleaved woodland (WD1), Mixed broadleaved / conifer woodland (WD2), Building and artificial surfaces (BL3), Freshwater (F) [over water], Riparian (WN5). ² | 4.5, 8.2, 8.3, 11.1, 16.1 |
| Natterer's Bat | <i>Myotis nattereri</i> | Phoenix Park, Liffey Valley | ✓ | IV | II | LC | Semi-natural woodland (WN), Highly modified non-native woodland (WD), Scrub / transitional woodland (WS), Linear woodland / scrub (WL), Stone walls and other stonework (BL1), Building and artificial surfaces (BL3), Non-marine caves (EU1), Artificial underground habitats (EU2), Freshwater (F) (over water), Riparian (FW). Hibernates in underground sites, including tunnels. Summer roost sites include old stone buildings, trees or bat or bird boxes. Individual animals sometimes encountered beneath stone bridges. ² | 4.5, 8.2, 8.3, 11.1, 16.1 |
| Soprano Pipistrelle Bat | <i>Pipistrellus pygmaeus</i> | Widespread | ✓ | IV | II | LC | Semi-natural woodland (WN), (Mixed) broadleaved woodland (WD1), Mixed broadleaved / conifer woodland (WD2), Building and artificial surfaces (BL3) & Hedgerows (WL1). ¹ | 4.5, 8.2, 8.3, 11.1, 16.1 |
| Whiskered Bat | <i>Myotis mystacinus</i> | Phoenix Park, Liffey Valley | ✓ | IV | II | LC | Semi-natural woodland (WN), (Mixed) broadleaved woodland (WD1), Mixed broadleaved / conifer woodland (WD2), Scrub / transitional woodland (WS), Linear woodland / scrub (WL), Improved agricultural grassland (GA1), Stone walls and other stonework (BL1), Building and artificial surfaces (BL3), Non-marine caves (EU1), Artificial underground habitats (EU2). ² | 4.5, 8.2, 8.3, 11.1, 16.1 |

*Habitats noted for the species, but not necessarily limited to.

**Bat species have varying roosting sites: spring gathering roosts, summer maternity roosts, hibernating winter roosts, & temporary overnight roosts.

¹ Sources: Conor Kelleher / Bat Conservation Ireland; Lundy, M.G. et al, 2011; Fossitt, J.A., 2001. Downloaded from: <https://species.biodiversityireland.ie/>

² Sources: Roche N. et al, 2014; Lundy M.G. et al, 2011; Conor Kelleher / Bat Conservation Ireland; Fossitt, J.A., 2001. Downloaded from: <https://species.biodiversityireland.ie/>

Table 4. Protected bird species in Dublin City

| Common name | Scientific name | EU BD | Bern | Bonn | BoCCI | SCI of SPA | Breeding (B)/ Wintering (W) | Actions in this BAP |
|---------------------------|----------------------------------|-------|------|------|-------|------------|--------------------------------|-------------------------|
| Arctic Tern | <i>Sterna paradisaea</i> | I | I | II | Amber | ✓ | B | 2.1-2.3 |
| Bar-Tailed Godwit | <i>Limosa lapponica</i> | I, II | III | II | Amber | ✓ | W | 2.1-2.3 |
| Black-Headed Gull | <i>Larus ridibundus</i> | II | III | - | Red | ✓ | B | 2.1-2.3 |
| Black-Tailed Godwit | <i>Limosa limosa</i> | II | III | II | Amber | ✓ | W | 2.1-2.3 |
| Common Tern | <i>Sterna hirundo</i> | I | II | - | Amber | ✓ | B | 2.1-2.3 |
| Curlew | <i>Numenius arquata</i> | II | III | II | Red | ✓ | W | 2.1-2.3 |
| Dunlin | <i>Calidris alpina</i> | - | II | II | Red | ✓ | W | 2.1-2.3 |
| Golden Plover | <i>Pluvialis apricaria</i> | I | I | II | Red | ✓ | W | 2.1-2.3 |
| Grey Plover | <i>Pluvialis squatarola</i> | II | III | II | Amber | ✓ | W | 2.1-2.3 |
| Kingfisher | <i>Alcedo atthis</i> | I | II | - | Amber | | B | 2.1-2.3, 4.6, 8.2 |
| Knot | <i>Calidris Canutus</i> | II | III | II | Amber | ✓ | W | 2.1-2.3 |
| Light-Bellied Brent Goose | <i>Branta bernicla hrota</i> | II | III | II | Amber | ✓ | W | 2.1-2.3, 2.7, 2.8, 15.1 |
| Little Egret | <i>Egretta garzetta</i> | I | II | II | Green | | B | 2.1-2.3 |
| Mediterranean Gull | <i>Ichthyaeus melanocephalus</i> | I | II | II | Amber | | B | 2.1-2.3 |
| Merlin | <i>Falco columbarius</i> | I | I | II | Amber | | W | 2.1-2.3, 6.7 |
| Oystercatcher | <i>Haematopus ostralegus</i> | II | III | - | Amber | ✓ | B W | 2.1-2.3 |
| Peregrine Falcon | <i>Falco peregrinus</i> | I | II | II | Green | | B | 2.1-2.3, 6.7 |
| Pintail | <i>Anas acuta</i> | II | III | II | Red | ✓ | W | 2.1-2.3 |
| Ringed Plover | <i>Charadrius hiaticula</i> | I | II | II | Amber | ✓ | B | 2.1-2.3 |
| Roseate Tern | <i>Sterna dougallii</i> | I | II | II | Amber | ✓ | B | 2.1-2.3 |
| Turnstone | <i>Arenaria interpres</i> | - | II | II | Green | ✓ | W | 2.1-2.3 |
| Sanderling | <i>Calidris alba</i> | - | II | II | Green | ✓ | W | 2.1-2.3 |

| Common name | Scientific name | EU BD | Bern | Bonn | BoCCI | SCI of SPA | Breeding (B)/ Wintering (W) | Actions in this BAP |
|------------------|--------------------------|-------|------|------|-------|------------|--------------------------------|---------------------|
| Shelduck | <i>Tadorna tadorna</i> | - | II | II | Amber | ✓ | B W | 2.1-2.3 |
| Short-Eared Owl | <i>Asio flammeus</i> | I | I | I | Amber | | B | 2.1-2.3, 6.7 |
| Shoveler | <i>Anas clypeata</i> | II | III | II | Red | ✓ | W | 2.1-2.3 |
| Spotted Redshank | <i>Tringa erythropus</i> | II | II | II | Amber | ✓ | W | 2.1-2.3 |
| Teal | <i>Anas crecca</i> | II | III | II | Amber | ✓ | W | 2.1-2.3 |

EU BD = European Union Birds Directive, Bern = The Bern Convention on the Conservation of European Wildlife and Natural Habitats; Bonn = Convention on the Conservation of Migratory Species of Wild Animals, BoCCI = Birds of Conservation Concern in Ireland^{vi}, SCI = Species protected as Special Conservation Interest of Dublin City's SPAs;

Table 5. Protected Fish species in Dublin City

| Common name | Scientific name | Areas recorded in Dublin | Fisheries Acts | EU HD | Bern | Red List | Actions in this BAP |
|------------------------------------|----------------------------------|--------------------------------------|----------------|-------|------|----------|---------------------|
| Atlantic Salmon* | <i>Salmo salar</i> | Rivers Liffey | ✓ | II, V | III | VU | 8.2, 8.5 |
| European Eel* | <i>Anguilla anguilla</i> | Rivers Liffey, Dodder, Mayne, Tolka | ✓ | II | | CR | 8.2, 8.5 |
| Brown/sea Trout | <i>Salmo trutta L.</i> | Rivers Liffey, Dodder, Tolka, Santry | ✓ | | | LC | 8.2, 8.5 |
| Brook Lamprey | <i>Lampetra planeri</i> | Rivers Liffey, Dodder, Tolka | ✓ | II | | LC | 8.2, 8.5 |
| River Lamprey | <i>Lampetra fluviatilis</i> | River Liffey, River Dodder, Tolka | ✓ | II, V | | LC | 8.2, 8.5 |
| Sea Lamprey | <i>Petromyzon marinus</i> | River Liffey | ✓ | II | | NT | 8.2, 8.5 |
| Freshwater Crayfish (white-clawed) | <i>Austropotamobius pallipes</i> | River Liffey, Camac | WA | II, V | | EN | 8.2, 8.5 |

EU HD = European Union Habitats Directive, Bern = The Bern Convention on the Conservation of European Wildlife and Natural Habitats, WA = Wildlife Acts, IUCN Red List Status: LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered. *Also projected under OSPAR – The Convention to Protect the Marine Environment of the North East Atlantic,

Table 6. Protected Amphibians, Reptiles, and Insect species in Dublin City

| Common name | Scientific name | Areas recorded in Dublin | Wildlife Acts | EU Habitats Directive | Red List Status | Actions in this BAP |
|----------------------------|---------------------------|---|---------------|-----------------------|-----------------|----------------------|
| Common Frog | <i>Rana temporaria</i> | Recorded in wetlands and garden ponds throughout the city | ✓ | V | LC | 4.4, 8.4, 13.3, 15.1 |
| Common Newt | <i>Triturus vulgaris</i> | Recorded in selected wetlands throughout the city | ✓ | - | LC | 4.4, 8.4, 13.3, 15.1 |
| Common Lizard | <i>Zootoca vivipara</i> | North Bull Island | ✓ | - | LC | 4.4, 8.4, 15.1 |
| Marsh Fritillary Butterfly | <i>Euphydryas aurinia</i> | North Bull Island | ✓ | II | VL-IBRL | 2.1, 2.2, 5.2 |

Wildlife Acts (1976 to 2018) and Wildlife (Amendment) Act 2020, IUCN Red List Status: LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered, VL-IBRL = Vulnerable on Ireland Butterfly Red List



Common Frog, Common Lizard and Marsh Fritillary (Photos: Rob Gandola and Maryann Harris).

Table 7. Protected Flora species in Dublin City

| Common name | Scientific Name | Areas recorded in Dublin | EUHD | FPO | Actions in this BAP |
|--------------------------|-----------------------------------|-----------------------------|------|-----|---------------------|
| Petalwort | <i>Petalophyllum ralfsii</i> | North Bull Island | II | ✓ | 2.1, 2.2, 3.2 |
| Hairy St. John's Wort | <i>Hypericum hirsutum</i> L. | Phoenix Park, Liffey valley | - | ✓ | 7.4 |
| Hairy Violet | <i>Viola hirta</i> | Phoenix Park | - | ✓ | 7.4 |
| Meadow Barley | <i>Hordeum secalinum</i> Schreber | Phoenix Park | - | ✓ | 7.4 |
| Lesser Centaury | <i>Centaurea pulchellum</i> | North Bull Island | - | ✓ | 2.1, 2.2, 3.2 |
| Meadow Saxifrage | <i>Saxifraga granulata</i> L. | North Bull Island | - | ✓ | 2.1, 2.2, 3.2 |
| Opposite-leaved Pondweed | <i>Groenlandia densa</i> (L.) | Royal and Grand Canals | - | ✓ | |
| Many-seeded Thread-moss | <i>Bryum intermedium</i> | North Bull Island | - | ✓ | 2.1, 2.2, 3.2 |
| Ceruous Thread-moss | <i>Bryum uliginosum</i> | North Bull Island | - | ✓ | 2.1, 2.2, 3.2 |
| Warne's Thread-moss | <i>Bryum Warneum</i> | North Bull Island | - | ✓ | 2.1, 2.2, 3.2 |

HD = European Union Habitats Directive, FPO = Flora Protection Order

2.7 Invasive Alien Species

The Convention on Biological Diversity (CBD) states that “Alien species that become invasive are considered to be the main direct drivers of biodiversity loss across the globe”^{vii}. The impacts of Invasive Alien Species (IAS) are wide ranging and destructive from economic, social, health and ecological viewpoints. The European Communities (Birds and Natural Habitats) Regulations^{viii} (S.I. No. 477 of 2011) establish the principle of prevention and provide for penalties for those found in breach. It is now illegal to release specified invasive animals into the wild. Any person, who plants, causes, or allows the dispersal, or causes the spread and growth of a listed plant, is guilty of an offence. The spreading of soil which contains invasive alien species is also prohibited. Species of flora and fauna are designated as invasive under the Third Schedule of the Regulations, of which 18 species are recorded in Dublin City. The EU IAS Regulations^{ix} sets down a comprehensive list of regulations that member states must comply with and makes provision for a list of IAS of European Union concern. The first list was published by the European Commission in 2014 and was updated in 2017 to include a total of 49 species, 7 of which are recorded in Dublin City.

Dublin City has had an Invasive Alien Species Action Plan since 2016, which is an action of the Dublin City Biodiversity Action Plan 2015-2020. None of the species listed in 2016 (Table 8) have been eradicated since then. However, pathways of invasion frequently occur along waterways and proceed downstream, making Dublin City an especially vulnerable location. The impacts of IAS in terms of degradation of our environment and damage to economic interests necessitate that we recognise IAS management as a key issue for sustainable development of Dublin. The species of IAS found in Dublin City are detailed in Table 8, and some were introduced into Ireland through Dublin. This Plan includes specific actions to address IAS as an essential task for restoring ecosystems.

Table 8. Invasive Alien Species recorded within Dublin City Council^x and their designation under Irish and European Union legislation

| Invasive Alien Species Recorded in Dublin City | Irish Regulations (S.I. No. 477/2011) | EU Regulation 1143/2014 |
|--|---------------------------------------|-------------------------|
| Species: flora | | |
| <i>Azolla filiculoides</i> {Water fern} | ✓ | |
| <i>Crassula helmsii</i> {New Zealand pigmyweed} | ✓ | |
| <i>Elodea canadensis</i> {Canadian waterweed} | ✓ | |
| <i>Elodea nuttallii</i> {Nuttall's waterweed} | ✓ | ✓ |
| <i>Fallopia japonica</i> {Japanese knotweed} | ✓ | |
| <i>Gunnera tinctoria</i> {Giant rhubarb} | ✓ | ✓ |
| <i>Heracleum mantegazzianum</i> {Giant hogweed} | ✓ | ✓ |
| <i>Hippophae rhamnoides</i> {Sea buckthorn} | ✓ | |
| <i>Hyacinthoides hispanica</i> {Spanish bluebell} and | ✓ | |
| <i>Hyacinthoides non-scripta</i> × <i>Hyacinthoides hispanica</i> {hybrid} | ✓ | |
| <i>Impatiens glandulifera</i> {Himalayan balsam} | ✓ | ✓ |
| <i>Lagarosiphon major</i> {Curly leaved waterweed} | ✓ | ✓ |
| <i>Myriophyllum aquaticum</i> {Parrot's feather} | ✓ | ✓ |
| <i>Rhododendron ponticum</i> {Rhododendron} | ✓ | |
| <i>Spartina anglica</i> {Common cordgrass} | ✓ | |
| Species: Fauna | | |
| <i>Neovison vison</i> {American mink} | ✓ | |
| <i>Rutilus</i> {Roach} | ✓ | |
| <i>Sciurus carolinensis</i> {Grey squirrel} | ✓ | ✓ |

3. The Dublin City Biodiversity Action Plan

3.1 Purpose of the Dublin City Biodiversity Action Plan 2021-2025

Ireland ratified the United Nations Convention on Biological Diversity (1992)^{xi} and is, therefore, obliged to act to conserve biodiversity and prepare a National Biodiversity Action Plan (2017-2021). It requires that local authorities review and update their Biodiversity Action Plans^{xii}.

The Dublin City Biodiversity Action Plan 2021-2025 is the third such plan produced by Dublin City Council and follows on from the 2015-2020 and 2008-2012 plans. The Plan is based on five themes that focus the outcomes for biodiversity conservation required across the city. Within these themes, there are 17 objectives for biodiversity management and conservation along with a series of 85 targeted actions with measurable outcomes to achieve these objectives (detailed in Section 3.5). Each theme links to the Strategic Objectives of the National Biodiversity Action Plan 2017-2021 while considering the urban context of biodiversity within Dublin. There is a new focus on restoration of biodiversity to respond to the public survey and reflect EU policy.

How the Dublin City Biodiversity Action Plan is used by Dublin City Council:

- To monitor changes in biodiversity and measure progress on actions for biodiversity over time.
- To ensure legal compliance by providing evidence-based information on biodiversity
- To inform decision makers and Council policies for the protection of biodiversity, for example the City Development Plan and parks and open spaces management
- To raise awareness of biodiversity and guide biodiversity education and outreach
- To communicate with developers and planners on biodiversity and validate conditions for consent in planning and development
- To require data collection by the Council and others on projects
- To guide the Dublin Bay UNESCO Biosphere policies and management for areas within Dublin City Council's administrative area
- To prioritise the Council's funding for biodiversity and source funding from external sources
- To support applications by others for funding and grants e.g., research

3.2 How the Plan Is Implemented

National and international guidance indicate that successful biodiversity conservation requires actions to be taken at a local level. The national policy framework for biodiversity in Ireland is the National Biodiversity Action Plan (NBAP), which sets out the objectives, targets, and actions for biodiversity to be undertaken by government, civil and private sectors to achieve Ireland's Vision for Biodiversity.

The legal powers to implement and enforce the Dublin City Biodiversity Action Plan is through adoption of the plan as an objective of the City Development Plan. The Dublin City Development Plan 2016-2022 contains policies and objectives for the conservation of the city's biodiversity, and it is anticipated that the next City Development Plan will build on this.

Dublin City Council will be the lead authority for the implementation of the Dublin City Biodiversity Action Plan 2021-2025. However, there are other lead agencies that have been identified on specific actions as well as numerous supporting agencies and organisations that will partner to deliver specific actions. There are also some actions that have multiple supporting partners, which allows for flexibility in the Plan, for example when organising an annual education and outreach programme.

Within Dublin City Council, management of biodiversity is coordinated by Parks, Biodiversity and Landscape Services and is complemented by the other work programmes operating within this Division, including the management of public parks, open spaces, street trees, green infrastructure, and Dublin City Council's role within the Dublin Bay UNESCO Biosphere Partnership and Dublin Mountains Partnership.

As in previous Dublin City Biodiversity Action Plans, it will be imperative to monitor the implementation of the actions detailed in this plan to ensure that the plan is effective. Therefore, there will continue to be an annual review, which will be published in the last quarter of each year.

3.3 Achievements from the Dublin City Biodiversity Action Plan 2015-2020

Over 95% of actions in the Dublin City Biodiversity Action Plan 2015-2020 were implemented, resulting in 35 specific Conservation, Research and Management projects and 28 Education and Outreach initiatives, with additional outreach through press, radio, and social media. The full list of these projects and initiatives is detailed in Appendix 1.

Among the highlights of the Plan was the implementation of a pesticide reduction strategy. Conscious of the need to reduce, replace, and/or eliminate the use of herbicides, and in particular glyphosate due to the potential risk to the environment and human health, Dublin City Council agreed a 'Herbicide Use Policy', with most parks and open spaces becoming 'chemical free'. Momentum from this also led to significant changes to mowing regimes, benefitting pollinators, wider biodiversity, and our role in climate action. Pollinator-friendly planting regimes shifted from traditional annual bedding schemes to being 80% suitable for pollinators. Sustainability initiatives also arose, with zero landscape waste to landfill policies, and increased focus on reducing energy and water consumption.

Pollinator planting in Markiewicz Park
(Photo: Lorraine Bull).



There was major progress in establishing baseline data for protected species, which will be used for future monitoring and is already informing planning and decision-making. In 2017, flora and vegetation surveys of 50 public parks provided a comprehensive baseline for sites and species of conservation value, with many parks supporting protected and rare species. A three-year survey of North Bull Island resulted in the most comprehensive evidence base in over a century, with over 40 floristically significant species identified and mapped. This work complements the 2020 database and map (Figure 3) of all habitats in Dublin City, which classifies them based on Irish and EU categories,

and allows for monitoring changes over time and informing decision making. Dublin City Council also launched the first county Invasive Alien Species Action Plan under the new EU Regulations and worked with many community groups to record and control invasive alien species.

Numerous city-wide surveys were undertaken, including otters along all major rivers, seals across Dublin Bay, herpetofauna (frog, common lizard, and newt) across several public parks, and most recently badgers, hedgehogs, and pygmy shrews. Significant research was undertaken on birds, including tagging surveys of Light-bellied Brent Goose and swans; surveys of river birds; baseline studies of ground-nesting birds at North Bull Island; and recreation impact studies on wildfowl and wading birds at North Bull Island, which resulted in updated recreational codes of practice. Surveys of coastal vegetation – particularly seagrass and algae – were also undertaken by partnering with Coastwatch Ireland and the National University of Ireland, Galway. A city-wide survey of hedgerows and woodlands was also completed in 2020, along with the Dublin City Tree Map with UCD that recorded the canopy cover across the city.



Algal survey by NUIG at North Bull Island (Photo: Anthony Woods).

The Plan commenced in parallel with the exciting news that Dublin Bay was granted UNESCO Biosphere Reserve status, with a focus on connecting people and nature, and the start of a programme for nature conservation. One of the highlights that contributed to this, was the establishment of the North Bull Island Volunteer Programme, which is key to engaging island users on responsible recreation. Another highlight was the highly successful 'Brent Goose Ambassadors' project, which was developed as part of the Plan's education actions and saw school children across Dublin City pledge to take actions benefitting the geese. This transferrable project model achieved high praise from UNESCO. Many of these initiatives received positive feedback when Dublin hosted the EuroMAB conference 2019, bringing together delegates from biosphere reserves across Europe and North America to share experience and collaborate.

Other educational outreach included the production of a guide, *Nature in The Park*, for primary schools with ECO-UNESCO, which enables teachers to use parks as outdoor classrooms, which proved to be particularly valuable during the pandemic. A *Short Guide to Three Dublin City Woodlands*, an educational guide to the woodlands of Bushy Park, St. Anne's Park and Tolka Valley Park was launched by Minister Malcolm Noonan and the Lord Mayor under the National Biodiversity Action Plan fund. The national 'Explore Your Shore' programme was launched at North Bull Island by the National Biodiversity Data Centre, who also provided public training workshops for the biodiversity outreach programme. Throughout each year, Parks, Biodiversity and Landscape Services hosted events with various partners to link into international and national awareness days, such as International Biodiversity Day, National Heritage Week, World Wetlands Day, and National Tree Week, and promoted biodiversity through national media, including RTÉ's Dawn Chorus events. The City's Arts Office also coordinated events and programmes on biodiversity and climate change themes to encourage public engagement and awareness.

Each year, the progress on implementation of the Plan was reported to the elected representatives and senior management of Dublin City Council, and a new annual stakeholders' conference was started to promote sharing of experience and knowledge among partners working on biodiversity in Dublin City. Dublin City Council is also a partner on the Dublin Bay UNESCO Biosphere Reserve Partnership and the Dublin Mountains Partnership, and strengthened and developed new partnerships with regional offices, agencies, and third level educational institutes to achieve the objectives of the Dublin City Biodiversity Action Plan 2015-2020.



Figure 5: Launch of the Nature in the Park booklet for primary schools at Fairview Park by Elaine Nevin, Eco-UNESCO and Maryann Harris, Dublin City Council, Senior Executive Parks and Landscape Officer, Biodiversity Section, with students of St Mary's National School, Fairview.

3.4 Developing the Dublin City Biodiversity Action Plan 2021-2025

The development of the Dublin City Biodiversity Action Plan 2021-2025 has been the result of a review process (outlined in Figure 6, below) that looked at the outcomes and recommendations from the previous City Biodiversity Action Plans; current legislation and policies; and the results of a public questionnaire survey. The review then fed into the development of the themes, objectives and actions that were co-created in partnership with agencies, environmental NGOs and third level educational institutes that took part in a Biodiversity Forum. Further information on this process can also be found in sections 3.4.1 and 3.4.2.

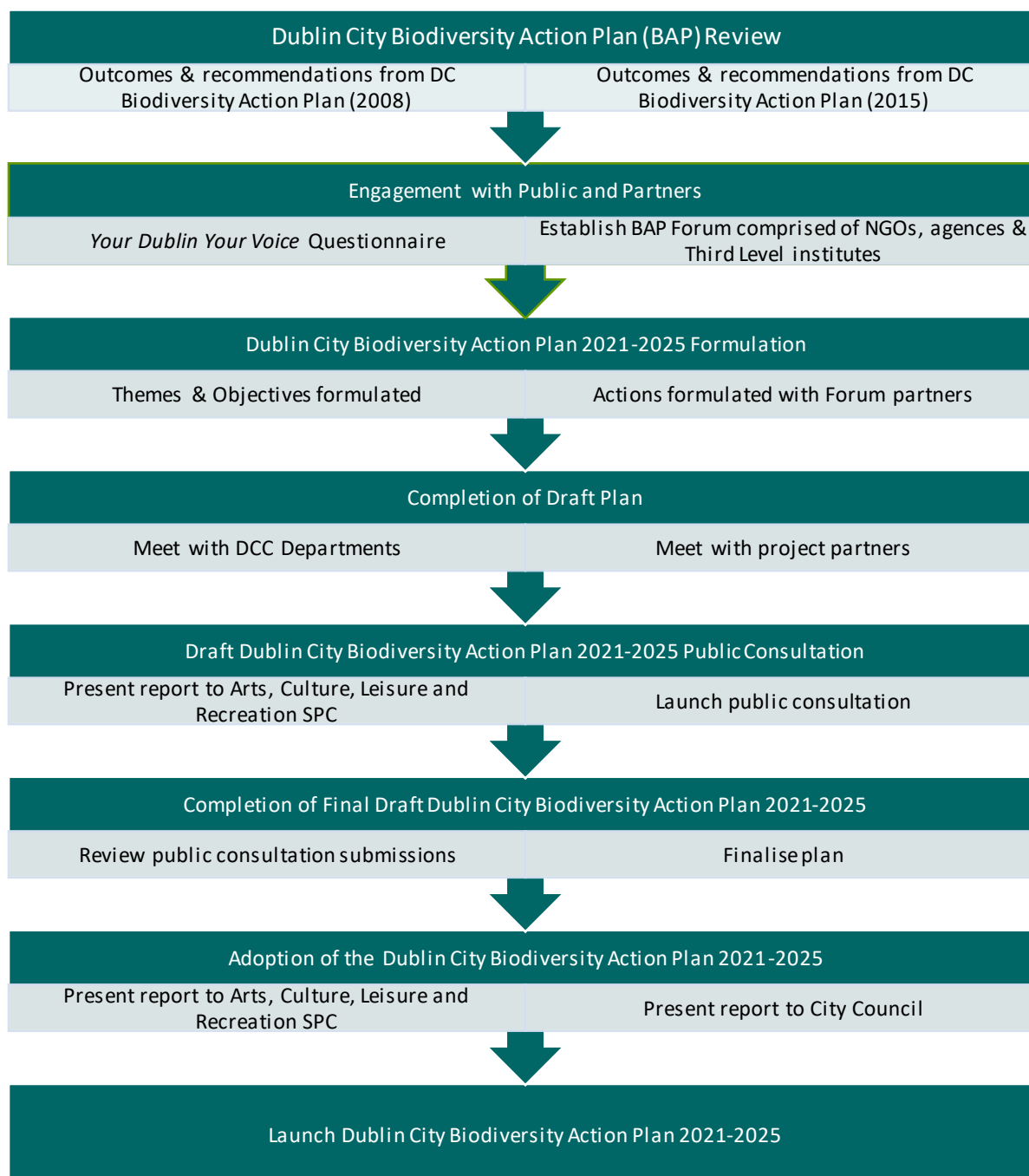


Figure 6: The review process for the Dublin City Biodiversity Action Plan 2021-2025.

3.4.1 Surveying the public

Parks, Biodiversity and Landscape Services reviewed the outcomes and recommendations from the previous City Biodiversity Action Plans and current legislation and policies. In December 2020, DCC conducted a public questionnaire survey via the local government-led opinion panel *Your Dublin Your Voice*, which gives an indication of opinion city-wide. The aim of the survey was to gauge people's awareness of biodiversity and seek their views on actions that are needed in Dublin City to conserve biodiversity. The survey attracted over 1,000 respondents. The global margin of error for this survey was +/-3% and some of the key findings detailed below are based on statistically significant results.

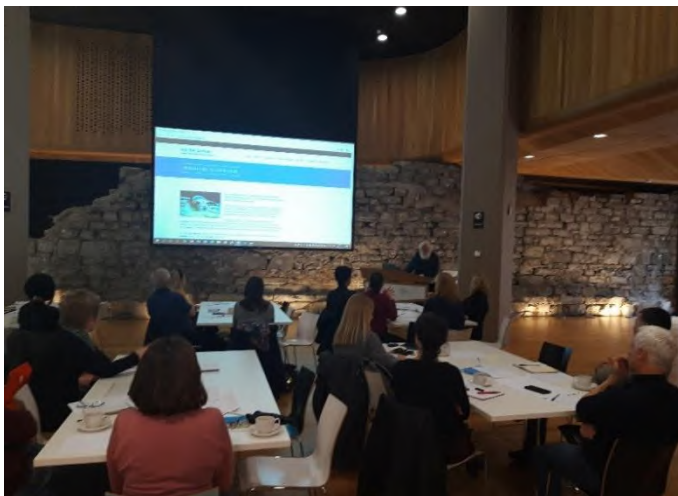
- 74% of respondents to the *Your Dublin Your Voice* December 2020 survey felt that biodiversity had become more important to them over the past 5 years to their quality of life.
- 74% of respondents to the *Your Dublin Your Voice* survey would like to see Dublin City Council carry out more habitat restoration projects.
- 50% would like to see the creation of new areas for wildlife.
- One-third have participated in practical activities to help the environment, such as beach clean-ups and volunteering with Tidy Towns or local resident group biodiversity projects.

For the full summary of the survey, please visit the Dublin City Council website at:

<https://www.dublincity.ie/business/economic-development-and-enterprise/economic-development/your-dublin-your-voice>

3.4.2 Dublin City Biodiversity Forum and Consultation

A Biodiversity Forum of over 40 representatives met remotely in February-April 2021 to further develop what themes, objectives and actions should go into the Plan. The Forum comprises partnering agencies, environmental NGOs, and educational institutions. Through workshops, there was a review of the Dublin City Biodiversity Action Plan 2015-2020: what worked well and why and any gaps; and also the key areas for biodiversity conservation over the next 5 years along with measurable targets.



Dublin City Biodiversity also met with other relevant agencies as well as other departments in Dublin City Council. For the list of the organisations that took part in this process please see Appendix 2.

Photo (L): Annual information seminars and workshops have previously been held to encourage sharing of knowledge and are planned to continue remotely and in person in the future.

3.5 Themes, Objectives and Actions of the Dublin City Biodiversity Action Plan 2021-2025

The Dublin City Biodiversity Action Plan is based on the following five themes that focus the outcomes for biodiversity conservation required across the city. Within these themes, there are 17 objectives for biodiversity management and conservation along with a series of targeted actions with measurable outcomes to achieve these objectives. Each theme links to the Strategic Objectives of the National Biodiversity Action Plan 2017-2021 while considering the urban context of biodiversity within Dublin. There is a new focus on restoration of biodiversity to respond to the public survey and reflect EU policy.

Theme 1: Maintaining Nature in the City

‘Knowing what you have is essential to conserve it.’

The global biodiversity importance of Dublin City is well-known and established through designations of the UNESCO Biosphere Reserve, the Natura 2000 sites, Important Bird Areas, RAMSAR site, IUCN Key Biodiversity Area and Natural Heritage Areas. Yet there is still a lack of information on the extent of certain species and their breeding sites, the sizes of their populations and their importance in their ecosystems. We need to ensure that we protect our nature conservation sites and manage them effectively for future generations. We also need to find out where different species are, how many of them we have, and what they require to survive and thrive in Dublin City, so that we can protect them. Maintaining nature is not just something we do to ensure legal compliance, but because it provides us with essential supports for the life of the city and its economy.

The first step to maintaining nature is to have an updated Dublin City Biodiversity Action Plan and to ensure that it is effectively implemented. Each of our designated sites for nature conservation has Conservation Management Objectives for Natura 2000 sites and requirements for connectivity of regionally proposed Natural Heritage Areas in Dublin City, which should be implemented. There are sites within the city of habitats of local biodiversity importance that need to be identified and protected using evidence-based research, including hedgerows and burial grounds. It is legally required to scientifically monitor, and conserve protected species within Dublin City, particularly those listed in the annexes of the EU Birds and Habitats Directive. There are also species which are not protected at European level, but which are in decline nationally or within Dublin City that need our attention to reverse declines and avoid local extinction. Since the last Dublin City Biodiversity Action Plan, the need to prepare and plan for the impacts of climate change on biodiversity has become a key issue for Dublin City. Many of our most protected species and habitats are at risk to changes both here and abroad, such as sea level rise. Sea level rise will vary in Ireland regionally, with Dublin Bay's conservation sites affected. Land use change and urbanisation continues to be a key threat to biodiversity in Dublin City. Therefore, we need to prepare and disseminate information to provide guidance for development and site management for biodiversity conservation.

| Objective 1: Ensure effective implementation of the Dublin City Biodiversity Action Plan | | | | |
|---|---|------------------|---|---|
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 1.1 | Undertake an annual review of the implementation of the actions identified in the Dublin City Biodiversity Action Plan | Annually | - | Annual review presented to DCC Strategic Policy Committee, published and distributed to relevant stakeholders |
| 1.2 | Undertake an annual review of the implementation of the biodiversity actions completed under the Dublin City Climate Action Plan | Annually | CARO | Annual review presented to DCC Strategic Policy Committee, published and distributed to relevant stakeholders |
| Objective 2: Protect designated sites for nature conservation in accordance with the Conservation Management objectives for Natura 2000 sites and proposed Natural Heritage Areas in Dublin City | | | | |
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 2.1 | Implement the Conservation Management objectives for the following Natura 2000 sites in Dublin City Council lands: North Bull Island SAC, North Bull Island SPA, South Dublin Bay and River Tolka Estuary SPA, South Dublin Bay SAC | 2021-2025 | NPWS, DBBP, DLRCC, FCC | No. of objectives implemented or completed for Natura 2000 sites |
| 2.2 | Implement the North Bull Island Nature Reserve Action Plan | 2021-2025 | DBBP, NPWS, NBI Oversight Forum | No. of actions from the plan completed |
| 2.3 | Support the implementation of the Dublin Bay UNESCO Biosphere Reserve Conservation and Research Strategy | 2021-2025 | DBBP, NPWS, DPC, DLRCC, FCC, FI, DNFC, NGOs | No. of actions from the plan completed |
| 2.4 | Prepare a conservation management plan for South Dublin Bay | 2021-2022 | NPWS, DBBP, DLRCC, SDCC | Management Plan completed |
| 2.5 | Monitor and prepare report on the seagrass (<i>Zostera</i> spp.) beds at Sandymount and Merrion Gates to inform conservation management of this area. | 2023 | DBBP, NPWS, NUIG, CWI | Survey completed & results published |

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|--|---|------------------|------------------------------------|--|
| 2.6 | Establish and support student research programmes at North Bull Island | 2021-2025 | Third level | No. of student projects completed annually |
| 2.7 | Support the DBBP to prepare grassland management guidelines for the management of Light-bellied Brent Goose feeding sites. | 2021-2023 | DBBP, DLRCC, FCC, IBGRG, NPWS, BWI | Management guidelines completed |
| 2.8 | Create a database and map of the feeding and roosting sites of Light-bellied Brent Geese within Dublin City to inform development, in conjunction with the Dublin Bay Biosphere Partnership, University of Exeter, and the Irish Brent Goose Research Group | 2021-2022 | DBBP, DLRCC, FCC, UoE, IBGRG | Database completed |
| Objective 3: Identify and protect sites that have conservation value for biodiversity using evidence-based research | | | | |
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 3.1 | Survey and populate into GIS all areas of conservation value within Dublin City using evidence-based research | 2022-2023 | DNFC, NGOs, Third level | No. of areas surveyed & results published |
| 3.2 | Continue to manage areas identified in the 2018 Flora Survey in accordance with recommendations from the survey | 2021-2025 | | No. of areas managed and completed recommendations |
| 3.3 | Implement recommendations of the Dublin City Hedgerow Survey 2020 to conserve hedgerows | 2021-2025 | | No. of recommendations completed |
| 3.4 | Conduct biodiversity surveys in Dublin City Council golf courses and implement measures for biodiversity | 2023-2024 | DNFC, NGOs | No. of completed surveys & programme of improvements devised |
| 3.5 | Conduct surveys and implement measures to conserve and enhance burial grounds as reserves for biodiversity | 2021-2025 | TUD, DNFC | Survey completed & results published. No. of recommendations implemented |

| Objective 4: Monitor and conserve legally-protected species within Dublin City, particularly those listed in the annexes of the EU Birds and Habitats Directive using evidence-based research | | | | |
|--|---|------------------|--|--|
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 4.1 | Conduct systematic survey of breeding bird populations on NBI, targeting Ringed Plover, Little Tern, Skylark, Stonechat, Meadow Pipit, Reed Bunting, Snipe and Grasshopper Warbler species. | 2021 | DHLGH, DCC, BWI | Survey completed & results published |
| 4.2 | Conduct new and repeat surveys of mammals in parks across Dublin City (targeting Badger, Hedgehog, and Pygmy Shrew) to inform conservation management | 2024 | NUIG, IWT | Survey completed & results published |
| 4.3 | Support the first National Hedgehog Survey and promote citizen science through the Helping Hedgehogs initiative | 2021-2022 | NUIG, GCC, MCC, RCC, KCC, DLR, UWT, CNaN | Survey advertised, training conducted, No. of sightings recorded & results published |
| 4.4 | Update Herpetofauna (Common Frog, Common Lizard, and Common Newt) surveys and assess suitable habitats in Dublin City parks | 2022 | HSI | No. of surveys completed & published |
| 4.5 | Review data and map in GIS the distribution of bats across the city and identify areas requiring surveying. | 2022-2023 | BCI, DBG | Review completed & results published |
| 4.6 | Conduct surveys for Kingfisher along the Liffey, Santry, Dodder and Tolka Rivers | 2023 | BWI, IMRG, NPWS | No. of surveys completed & published |
| 4.7 | Implement the recommendations of the Dublin City Otter Survey (2019) and update the survey to include Dublin canals | 2023-2025 | NPWS, WWI, other State Agencies | No. of recommendations completed by 2025 and survey of canal completed |
| 4.8 | Support the DBBP to conduct a bay-wide Grey seal tagging and monitoring survey | 2024 | DBBP, DLR, DPC, FCC, NPWS, ISS | Survey completed & results published |
| 4.9 | Update the 2018 Grey seal and Common seal census of Dublin Bay | 2024 | DBBP, ISS | Survey completed & results published |
| 4.10 | Develop an agreed approach to recording seal mortality within Dublin Bay | 2021-2025 | DBBP, ISS, SRI, NPWS | Approach agreed & disseminated to partners |

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|---|--|------------------|---|--|
| 4.11 | Update wildlife impact surveys on North Bull Island | 2021-2025 | DBBP, BWI, HSI | No. of surveys completed & results published |
| Objective 5: Prepare and plan for the impacts of climate change on biodiversity | | | | |
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 5.1 | Identify natural heritage at risk from climate change in Dublin City to inform planning and management decisions | 2021-2023 | Various including CARO, Third level, NGOs, DNFC | No. of species & habitats identified as at risk |
| 5.2 | Prepare a city-wide survey of butterfly populations on an evidence-based review | 2021-2022 | DCC, DNFC | Survey completed & results published |
| 5.3 | Facilitate annual monitoring of coastal change in Dublin Bay for coastal zone management | 2021-2025 | GSI, TCD | Annual surveys completed |
| 5.4 | Facilitate baseline groundwater monitoring of Dublin City by Geological Survey of Ireland and prepare public information/educational materials | 2021-2025 | GSI | Survey completed. Results published. Materials launched. |
| 5.5 | Assess causes and impacts of Ectocarpus brown algal growth in Dublin Bay | 2023 | NUIG | Assessment complete & actions developed |
| Objective 6: Implement measures for species with that have a local biodiversity value or impact local biodiversity | | | | |
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 6.1 | Conduct systematic survey of Swifts across key Dublin suburbs to locate breeding sites and assess populations within the city. | 2021 | BWI | Survey completed & information provided to owners of breeding sites. |
| 6.2 | Undertake Swift and House martin monitoring projects and establish new sites with community groups and relevant institutions | 2022-2025 | SCI, BWI, communities | No. of new sites established & monitoring reports completed |

| | | | | |
|---|--|------------------|-------------------------------------|---|
| 6.3 | Produce species lists of flora and fauna for key Dublin City Council parks to identify gaps in knowledge and raise awareness at a local level | 2022-2025 | DNFC, Third level, DNFC, NGOs, IWT | No. of species lists produced. No. of awareness raising activities. |
| 6.4 | Conduct trial monitoring of fox populations at selected public parks in Dublin City to assess their status and role in the ecosystem | 2021-2022 | UCD, OPW | Survey completed & information provided to owners of breeding sites. |
| 6.5 | Support the Mute Swan Census to monitor the population in Dublin City. | 2021-2025 | IMRG | No. of annual census surveys completed |
| 6.6 | Conduct bird ringing and monitoring surveys in City Centre public parks and install nest boxes where appropriate | 2021-2025 | IMRG | No. of parks surveyed, monitoring statistics & No. of bird boxes |
| 6.7 | Initiate a Dublin City raptor survey and monitoring programme | 2022-2025 | BWI | No. of species surveys completed and monitoring programme established |
| Objective 7: Prepare and disseminate information on guidance for development and site management for biodiversity conservation | | | | |
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 7.1 | To prepare revised guidelines for developers for taking-in-charge to include biodiversity measures. | 2021 | - | Guidelines published |
| 7.2 | Ground truth habitats and update the Dublin City Habitat Map | 2022-2025 | DNFC | No. of habitats checked and map updated |
| 7.3 | Conduct training sessions for relevant DCC staff on biodiversity conservation for Continuing Professional Development and to ensure best practice | 2021-2025 | Professional Institutes, DNFC, NGOs | No. of training sessions |
| 7.4 | Update the manual of best practice management for the conservation of biodiversity within public parks and develop a strategy to increase biodiversity | 2024 | OPW | Manual updated and disseminated |
| 7.5 | Provide information on habitats and species and their occurrence in Dublin City produced under the BAP to support decision-making and research | 2021-2025 | DBBP & various partners | Percentage of studies available |

Theme 2 - Restoring Nature in the City

‘As a city of over a thousand years, Dublin has a long history of development, some of which has been detrimental to biodiversity and should be redeveloped to recover biodiversity and ecosystems.’

At global and European levels, biodiversity policy has shifted focus toward the need for restoring ecosystems to address the continuing loss of habitats and species and as a response to crisis. Our public survey showed that Dubliners want to see restoration of habitats and remediation of damage caused by poor practices in the past.

Dublin City still has rivers that are culverted, or which are difficult for fish and other species to pass through; wetlands that were used as landfills; and areas of green spaces that are disconnected. Local initiatives for re-wilding are gaining support and efforts to control invasive alien species require support from many landowners. There are opportunities for communities to take positive action for biodiversity, to convert grey spaces to green and to realise the potential for reversing decline. The Plan includes new actions specifically to meet the call for restoration.

Through cooperation with partner organisations and community groups, it is planned to devise and implement habitat restoration initiatives across Dublin City. A key approach is to use nature-based solutions to restore biodiversity and ecosystem services. Nature-based solutions are also seen as cost-effective and more sustainable. They are promoted by the European Union as a way to address climate change. The concept of ecosystem services gives recognition to the ways in which nature provides supports for us every day – the hidden benefits we may overlook. Like most cities, Dublin City’s biodiversity is impaired by invasive alien species which replace native species and alter ecosystems. Restoring ecosystems requires us to strengthen measures to control invasive alien species, improve biosecurity and the ecological status of river catchments. Restoration projects will need to be targeted and progress measured to learn what is most effective in Dublin City.

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 wellbeing and biodiversity benefits”

International Union for Conservation of Nature.
<https://www.iucn.org/>

| Objective 8: Devise and implement habitat restoration initiatives across Dublin City | | | | |
|--|---|-----------|--|---|
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 8.1 | Identify sites owned by Dublin City Council for habitat restoration potential | 2024-2025 | UCD, DNFC, NGOs | No. of sites identified |
| 8.2 | Support river restoration measures for key rivers in Dublin City, including continuing measures for the River Tolka and new initiatives for the Santry and Camac Rivers | 2021-2025 | LAWPRO, IFI, ANG, OPW, NPWS, DNFC | Extent of river zones restored |
| 8.3 | Gather evidence-based data and develop a wildlife corridors strategy for Dublin | 2023-2025 | WWI, Irish Rail, IFI, DNFC, landowners | Strategy completed |
| 8.4 | Implement pilot projects to retrofit and construct wetlands for biodiversity | 2021-2023 | DHLGH, NGOs | Completion of pilot projects |
| 8.5 | Support Inland Fisheries Ireland to implement measures to support migratory fish and their life cycles, particularly Atlantic salmon, eel, and lamprey | 2021-2025 | IFI, DCC, OPW, NPWS, LAWPRO, ANG | No. of measures completed |
| 8.6 | Investigate the potential for a seagrass (<i>Zostera</i> spp.) restoration project in Sandymount | 2021-2024 | NUIG, CWI, NPWS, | Research Project initiated |
| 8.7 | Work with community organisations to support nature targeting areas of high land use density as identified in the EU Urban Atlas, such as community gardens and small-scale rewilding | 2023-2025 | Tidy Towns and community groups | No. of community groups engaged. Area (Ha) where measures implemented |

| Objective 9: To use nature-based solutions to restore biodiversity and ecosystem services | | | | |
|---|---|------------------|---|--|
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 9.1 | Produce an ecosystem services map for biodiversity in Dublin City | 2023-2024 | DBBP, Third level, NGOs, community groups | Map completed and published |
| 9.2 | Implement actions from the All-Ireland Pollinator Plan (2021- 2025) | 2021-2025 | DCC, Tidy Towns & community groups | No. of actions implemented; outcome of actions, & area (Ha) enhanced for pollinators |
| 9.3 | Strengthen understanding of natural capital and ecosystem services to inform policy and decision-making in Dublin City | 2021-2025 | Natural Capital Forum | No. of training workshops held |
| 9.4 | Agree a programme of measures for recovery of intertidal habitats in Dublin City | 2022-2024 | Third level, CWI, NGOs, community groups | Programme agreed |
| Objective 10: Strengthen measures to control Invasive Alien Species (IAS), improve biosecurity and ecological status of catchments | | | | |
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 10.1 | Map species, quantify problem and implement actions to control IAS on public lands and waterways | 2021-2025 | DHLGH, NPWS, FCC, DLRCC, SDCC, ANG, IW, WWI, LAWPRO | No. of areas mapped, problems identified and actions implemented |
| 10.2 | Support the development of a communications strategy for the early warning of IAS to prevent the spread of new IAS | 2021-2022 | NBDC, NPWS, FCC, DLRCC, SDCC, LAWPRO, ANG | Strategy agreed jointly for a pilot basis on one species |
| 10.3 | Investigate detection and monitoring of IAS species using eDNA in combination with biological survey approaches in aquatic habitats in accordance with the NBAP | 2021-2022 | DHLGH, NUIG, DCC, NPWS, NBDC | Pilot project on e-DNA monitoring for one waterbody |

Theme 3 - Building for Biodiversity

'Considering biodiversity at all stages of the planning, building, and maintaining processes'

Building for biodiversity requires us to consider how to protect biodiversity at all stages of planning, construction, and maintenance of building projects. As the city grows and evolves over time, species have persisted (perhaps despite human actions) and we need to ensure that they can continue to survive and even flourish. Ireland has made a commitment under its National Biodiversity Action Plan to ensure no net loss of biodiversity, in line with international agreements. Dublin City Council has an obligation to ensure this in its plans and projects within the city. However, to correctly address the biodiversity crisis, standing still is not an option.

A key objective is to promote net biodiversity gain and ensure there is no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure. This will necessitate designers, engineers, planners, and builders to approach biodiversity not as a constraint to a project but which they can contribute to conserving – even an opportunity. This approach promotes innovation and use of best practice in Ireland's capital, showcasing the creativity and problem-solving expertise of its people. This also encourages integration of projects, their phasing and their management which can be cost-effective and time efficient. The results are projects that deliver a greater range of ecosystem services, which preserve vital ecosystem functions, and which increase resilience of Dublin in terms of climate change and biodiversity loss. Projects which employ nature-based solutions will reduce the burden on the taxpayer and will ensure Dublin grows sustainably.

Within Dublin City, many protected species have lost their natural habitats and now increasingly rely upon artificial or human-built ones, such as gaps in bridges and walls. Recognising this, there are actions in this Plan to learn how species have adapted and to pilot initiatives for the creation of habitats using artificial habitat methods. This can then inform new building projects to incorporate habitats for wildlife. Such methods will be increasingly important in an urbanising world and there is an opportunity for people to learn and develop skills while enhancing biodiversity.

Biodiversity includes soils. Dublin City has above average levels of soil sealing compared to cities within the European Union^{xiii}. This has negative impacts on ecosystem functions, such as natural processing of pollutants by bacteria, storage of storm water and providing habitats for wildlife. It also limits ecosystem services and contributes to costly projects to control flooding. A key objective is to minimise and reduce soil degradation in the Dublin City Council administrative area. This will require a more focused approach in design and construction on the layout of projects and how soil is managed as a resource. Soils are essential for sequestration of carbon and can help to reduce emissions that contribute to climate change.

| Objective 11: Ensure that measures for biodiversity and nature-based solutions are incorporated into new building projects, retrofit and maintenance works | | | | |
|---|---|------------------|---------------------------------|---|
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 11.1 | Develop a Technical Guidance Document containing a set of standard conditions for biodiversity conservation in Dublin City to inform planning and development | 2021-2025 | NGOs | Conditions prepared & in use |
| 11.2 | Disseminate best practice guidance on mitigating impacts for biodiversity in new and existing building projects | 2021-2025 | NGOs, DNFC, HC, HON | No. of guidance publications disseminated |
| Objective 12: Promote net biodiversity gain and ensure there is no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure | | | | |
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 12.1 | To develop a programme for net biodiversity gain to guide future development in association with professional bodies. | 2023-2025 | Professional bodies, NGOs, DNFC | Programme agreed & published |
| 12.2 | To ensure that climate change adaptation measures align with biodiversity conservation measures on projects in Dublin City | 2024 | - | No. of alignments communicated |
| 12.3 | To contribute to the Dublin City Green Infrastructure Strategy | 2021-2025 | | Strategy completed & adopted |
| 12.4 | Contribute to Dublin City Council's Sustainable Urban Drainage Systems (SuDS) Guidelines to promote net biodiversity gain | 2021-2022 | - | Guidelines adopted with review process ongoing |
| 12.5 | To implement greening strategies informed by ecological assessment for Dublin City to support biodiversity | 2021-2025 | - | No. of strategies implemented & scoring of value for biodiversity |

| Objective 13: | | Pilot initiatives for the creation of habitats using artificial habitat methods | | |
|---------------|--|---|--------------------------|--|
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 13.1 | Conduct research on measures for design and installation of artificial habitats in Dublin City | 2021-2025 | Third level | No. of studies completed |
| 13.2 | Survey the current extent of usage of artificial habitats in Dublin City by various species | 2023-2024 | HSI, IWT, DNFC | Survey & report completed |
| 13.3 | Install artificial habitat measures on Dublin City Council owned lands and projects | 2021-2025 | DCC | No. of measures installed by 2025 |
| Objective 14: | | Minimise and reduce soil degradation in the Dublin City Council administrative area | | |
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 14.1 | Support research on soil sealing and soil geochemistry to advance knowledge of soil degradation in Dublin City | 2021-2022 | UCD, GSI | No. of surveys supported |
| 14.2 | Prepare public awareness campaign and guidance to reduce soil sealing of private gardens | 2023 | LAWPRO, community groups | Campaign launched & guidance published |

Theme 4 - Understanding Biodiversity in the City

“Realising we are all part of biodiversity and that by working together we can enact real change to conserve biodiversity.”

The realisation that we are all part of biodiversity and working together is critical in the fight to conserve biodiversity has never been more apparent. The drafting of this Plan took place during a global pandemic, where people working from home began to observe and connect with the natural world. As evident in our public survey, people’s appetite to know more about the nature around them and work on community-based projects has significantly increased. This theme encompasses education and outreach, awareness raising campaigns, citizen science projects, and empowering communities to take positive action for biodiversity. Recording schemes through citizen science are valuable tools for monitoring changes and have the potential to encourage behaviour change and foster stewardship of biodiversity. Providing data platforms to foster knowledge sharing is also a key component and several partners will work to increase understanding and appreciation of biodiversity and its importance across Dublin City.

| Objective 15: Increase understanding and appreciation of biodiversity and its importance across Dublin City | | | | |
|---|---|-----------|--|---|
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 15.1 | Implement an annual education and outreach programme to raise awareness of biodiversity, which will be promoted through various Dublin City Council outlets, the Dublin Bay Biosphere, and various supporting agencies. | Annually | DBBP, NGOs, HC, DNFC, Third level, LAWPRO | No. of events, & outreach figures |
| 15.2 | Develop interpretation and education programmes for schools and community groups in collaboration with various stakeholders | 2021-2025 | ECO, BWI, HC, OWLS, HSI, IFI, LAWPRO, NGOs | No. of projects & outreach figures |
| 15.3 | Engage with citizens to promote behavioural changes & raise awareness of biodiversity & climate change through collaboration between City Arts Office, City Heritage Office, & other stakeholders | | CARO, DBBRP, LAWPRO | |
| 15.4 | Disseminate a range of resources to raise awareness of biodiversity across the city, including guides on how people can help biodiversity at home | 2021-2025 | DNFC, NGOs | No. of resources produced & distributed |
| 15.5 | Produce a Biodiversity Communications Strategy | 2022 | NGOs | Strategy produced & in use |

| | | | | |
|---|--|------------------|---|---|
| 15.6 | Produce a quarterly newsletter on biodiversity projects and news in Dublin City | 2022-2025 | DNFC, NGOs, Third level | No. of newsletters produced. Distribution & outreach figures. |
| 15.7 | To develop content for Biodiversity Education/Outreach Programmes for proposed educational centres at Liffey Vale and North Bull Island (subject to planning approval). | | Eco-UNESCO, Bright? | Content developed |
| Objective 16: Empower citizens to connect with, and take positive action for biodiversity at a local and city-wide level | | | | |
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 16.1 | Develop a series of citizen science projects to increase awareness of biodiversity and data collection on various species in collaboration with DCC Offices, the Dublin Bay UNESCO Biosphere and other stakeholders. | 2021-2025 | DBBRP, Third level, NGOs, LAWPRO | No. of projects carried out over 5 years |
| 16.2 | Support existing volunteering initiatives for biodiversity, including the volunteer programme on North Bull Island | 2021-2025 | DBBP, NBIV, BIAG, DAG, NGOs, CVI, DNFC | No. of volunteering opportunities completed |
| 16.3 | Support communities to prepare and implement local area biodiversity action plans to encourage practical action for biodiversity and shared learning | 2021-2025 | Residents, community & Tidy Towns' groups, NGOs | No. of site visits & projects initiated |

Theme 5 - Partnering for Biodiversity

'Working together to protect and manage for biodiversity will create further opportunities'

Dublin City Council cannot independently address the biodiversity crisis. Partnering with others is the best means to act quickly and with the best knowledge available. This Plan includes actions to strengthen collaboration for the conservation of biodiversity at a regional, national, and global level, which will be achieved through existing partnerships – such as Dublin Bay UNESCO Biosphere Reserve and the Dublin Mountains Partnership – and by developing new ones. Several Dublin City Council departments can provide bridges to different actors for biodiversity across communities, while non-governmental organisations and the wider research community can help to build these for Dublin City.

| Objective 17: | | Increase understanding and appreciation of biodiversity and its importance across Dublin City | | |
|---------------|--|---|--|--|
| Action No. | Action | Timeframe | Agencies & Partners | Performance Indicators |
| 17.1 | Implement and promote the objectives of the Dublin Bay UNESCO Biosphere Partnership and promote the work of the Biosphere. | 2021-2025 | DCC, DPC, DLRCC, FCC, FI, NPWS, NGOs, DNFC | No. of objectives completed events held & joint projects |
| 17.2 | Work with the Dublin Mountains Partnership on implementing strategic plans and activities incorporate biodiversity conservation | 2021-2025 | DCC | Resources provided, attendance at meetings & participation in the DMP advisory fora & committees |
| 17.3 | Facilitate an annual workshop/seminar for information exchange between Dublin City Council, the Biodiversity Action Plan Forum members, other biodiversity experts and relevant bodies | Annually | Biodiversity Forum | No. of workshops held |
| 17.4 | Work with other Irish local authorities to strengthen our knowledge and protect habitats and species | 2021-2025 | Other LAs, HC, LAWPRO, NGOs | Collaborative projects agreed and implemented |
| 17.5 | Strengthen the relationship between DCC and the National Biodiversity Data Centre to support and promote citizen science recording initiatives, and to ensure these data are shared to inform the work of both partners. | 2021-2025 | DCC, NBDC | No. of citizen science initiatives implemented. |
| 17.6 | Participate in and support, as a stakeholder or partner, applications for European Union-funded projects for biodiversity in Dublin City | 2021-2025 | DCC, Third level, NGOs | No. of projects that are supported |

3.5.1 Case Study on North Bull Island

The North Bull Island National Nature Reserve is nestled within north Dublin Bay. It is a low-lying sandy spit, with Dollymount Strand on the seaward side of the island, and salt marsh fringing its mainland side. Between the island and the mainland are intertidal mud and sandflats. Dublin Bay, due to its shifting sands, tidal nature, and shallow inlets, had been treacherous at times for navigation and had claimed many lives. The shipping channel in Dublin Bay was too shallow for larger vessels, and many ships were forced to unload their cargo at Ringsend onto lighters that could travel upriver. In 1800 a major survey of Dublin Harbour was conducted by Captain William Bligh, who is remembered for his role on the HMS *Bounty*. Bligh's recommendations were rejected in favour of proposals made by Scottish engineer, John Rennie, who was engaged to conduct a review of the harbour and port, including an earlier proposal to build a pier wall out from Clontarf made by William Chapman in 1786^{xiv}. This wall, which was completed in 1825 to become the North Bull Wall, would prevent sand building up in the mouth of the harbour. A consequence of this process was that sand began to accumulate along its side and eventually formed the island we see today. Bull Island is still a dynamic environment that is continually changing and is the only site on the east coast of Ireland where sand dunes are building rather than eroding.



North Bull Island Nature Reserve (Photo: Brendan Norris).

Despite its origins from fairly-recent human activities, North Bull Island is the most designated nature conservation site on the island of Ireland. It has a history of over one hundred years of designations, from its declaration as a Rothschild Reserve in 1914, one of the first such nature reserves in the United Kingdom and Ireland. It was the first National Bird Sanctuary in Ireland in 1931 and was then declared a National Nature Reserve in 1988. Through the efforts of many people in Dublin, it was designated by Ministerial Order as a National Special Amenity Area in 1995 for its beauty and nature conservation importance. It was a 'first-generation' UNESCO Biosphere Reserve, designated in its own right in 1981, and then as part of the core zone of the extended Dublin Bay Biosphere Reserve in 2015. Its wetlands are designated under the international Ramsar Convention. The International Union of Conservation of Nature (IUCN) has recognised Dublin City as an Urban Key Biodiversity Area based on the habitats of North Bull Island and Dublin Bay.

Its importance within Europe is recognised through designation as both a Special Protection Area under the EU Birds Directive and a Special Area of Conservation under the EU Habitats Directive. This includes a Priority Annex I Habitat (grey dunes) and an undisturbed sequence of ten habitats of European importance. The Island supports nine habitats and a range of species protected under the EU Habitats Directive, including Marsh Fritillary Butterfly, Harbour and Grey Seal, and at least three species of bat (Common Pipistrelle, Soprano Pipistrelle, and Leisler's). The island's Flora is significant. 361 plant species have been recorded, including five legally protected rare species: the liverwort (*Petalophyllum ralfsii*) (Habitats Directive, Annex II), Lesser Centaury (*Centaurea pulchellum*) and rare

mosses (*Bryum intermedium*, *Bryum uliginosum* and *Bryum Warneum*) which are designated under the national Flora Protection Order (2015).

Bird Life International have also recognised the Island as an Important Bird Area and a key part of the East Atlantic Flyway, an international route for migrant birds travelling from the Canadian Arctic to the Mediterranean region and Africa. It supports a range of overwintering wildfowl and wading birds protected under the EU Birds Directive, including the Light-bellied Brent Goose, Black-tailed Godwit and Bar-tailed Godwit, plus a further 14 species that regularly occur in nationally important numbers (Shelduck, Teal, Pintail, Shoveler, Oystercatcher, Grey Plover, Golden Plover, Knot, Sanderling, Dunlin, Curlew, Redshank, Turnstone and Black-headed Gull). The Island also supports significant numbers of birds during the summer period, including migratory sand martins, swifts, and swallows that breed in Ireland but then return to Africa.

North Bull Island is a case study for the implementation of the themes of the Dublin City Biodiversity Action Plan.

Theme 1 - Maintaining Nature in the City

North Bull Island is the most important nature conservation site in Dublin City. Dublin City Council is the main landowner and manages the island through implementation of the North Bull Island Management Plan. The Conservation Management Objectives prepared by the National Parks and Wildlife Service for the Natura 2000 sites provide legally-binding requirements to ensure that development in Dublin City is carried out to preserve the integrity of these sites. The island is a National Amenity Area, and it is essential that its beauty and recreational uses are balanced with nature conservation. Survey work undertaken during the last Dublin City Biodiversity Action Plan 2015-2020 has provided more comprehensive baseline data to inform decision making on island management. This monitoring work together with targeted actions will be a key part of this Plan.

Theme 2 - Restoring Nature in the City

Recreation impact studies on wildfowl and wading birds at North Bull Island have led to updates of recreational codes of practice. Further impact surveys have been undertaken on seals and are planned for ground-nesting birds. Work is ongoing to further reduce disturbance across the island through education and signage. It is hoped that this will restore safe nesting, feeding and roosting areas for key species. Alien Invasive plant species also impact the island and there has been ongoing removal of the invasive plants, including Sea buckthorn, over several years. A key objective of this plan is to strengthen measures to control Invasive Alien Species (IAS), improve biosecurity and ecological status of catchments, which will enhance efforts to control IAS on the island.

Theme 3 - Building for Biodiversity

The North Bull Island Interpretative Centre has been promoting sustainability and the benefits of biodiversity through its education programmes for several years. The island itself has solar-powered showers on the beach, and there are plans for piloting solar-powered signage for bathers. Old buildings on the island, such as the old toilet blocks are also having artificial habitats, such as nest boxes, installed within their walls to accommodate nesting birds.

At the time of writing, a proposed Discovery Centre at North Bull Island is progressing through the planning process. The new building will be passive with foul sewerage being piped to the mainland to ensure there is no impact on the island's sensitive habitats.

Theme 4 - Understanding Biodiversity in the City

North Bull Island is a national and local resource for organisations that teach the public about biodiversity. The North Bull Island Interpretative Centre has been running educational workshops and accommodating research for a number of years. Seven universities from across Ireland and the United Kingdom have conducted research on the island, which has fed into management of the island and promoted awareness of its important habitats and species. Numerous schools from Dublin take part in field trips and educational workshops. Due to its accessibility to the city centre and Dublin Airport, it has also hosted international and national educational events for biodiversity, climate change and sustainability, including visits by ICOMOS and UNESCO. It is a centre for educational programmes by the National Biodiversity Data Centre and there is cooperation with the National Botanic Gardens. The establishment of the North Bull Island Volunteer Programme during the last Biodiversity Action Plan has also provided engagement to island users on responsible recreation and behaviours, and actions under this theme in this Plan will look to build on this work to date.

Theme 5 - Partnering for Biodiversity

The North Bull Island Nature Reserve demonstrates a partnership approach to managing the multiple issues that arise in a nature reserve, which is within a capital city and has in excess of 1 million visitors a year. The expansion of the UNESCO Biosphere designation in 2015 from the Nature Reserve to the entirety of Dublin Bay was achieved by the establishment of a Partnership with Fingal County Council, Dublin Port Company, Dun Laoghaire Rathdown County Council and the National Parks and Wildlife Service. This partnership has enhanced the joint decision making and information sharing for conservation around the bay.

A conservation programme for volunteers to meet like-minded environmentalists to promote nature conservation and raise awareness of what makes the Bull Island such a special place was set up in recent years, and many local environmental groups play a key role in helping protect the island.

Following a review of the management plan for North Bull Island in 2020, Dublin City Council prepared a 20-point action plan, one action of which was the establishment of a North Bull Island Oversight Forum to facilitate discussion and collaboration between all stakeholders including elected representatives, residents' groups, environmental NGO's and volunteers groups. The Oversight Forum takes a holistic approach to the Island, recognising the need to balance the natural environment with its recreational and amenity value.



Volunteers learning how to remove invasive alien species at North Bull Island National Nature Reserve.

4. Key legislation

4.1 European Union Habitats Directive and Birds Directive

The EU nature legislation refers to the EU Habitats Directive (1992) and the EU Birds Directive (codified version, 2009). These are the cornerstones of nature conservation across the EU, and the two main pillars of these Directives are the management of the 'Natura 2000 Network' and the protection of 'Annex Habitats (Annex I) and Species' (Annex II, IV, and V).

The Natura 2000 Network is an EU wide network of areas designated for nature conservation and includes Special Areas of Conservation (for Annex I habitats and Annex II species, referred to as Qualifying Interests), and Special Protection Areas (for birds and wetlands, referred to as Special Conservation Interests). Annex IV species are legally protected wherever they occur. Dublin City Council has two Special Areas of Conservation, two Special Protection Areas, seven Annex II species (not protected by the Natura 2000 Network), and nine Annex IV Species occurring within its administrative area. The Habitats and Birds Directives are transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011, the Wildlife Acts (1976 to 2021) and, in part, by the Planning and Development Act 2000, as amended. The Dublin City Biodiversity Action Plan 2021-2025 must comply with this legislation but is not a mechanism for implementing or enforcing it.

The [European Communities \(Birds and Natural Habitats\) Regulations 2011 \(S. I. No. 477 of 2011\)](#) transpose the European Union Birds and Habitats Directive – known collectively as the Nature Directives. The 2011 Regulations were amended by:

- [S.I. No. 290 of 2013](#)
- [S.I. No. 499 of 2013](#)
- [S.I. No. 355 of 2015](#)
- [Planning, Heritage and Broadcasting \(Amendment\) Act 2021 \(no.11 of 2021\), Chapter 4](#)
- [S.I. No. 293 of 2021](#)

A key protection mechanism in the 2011 Regulations is the requirement (Regulation 42) for all public authorities to conduct a screening for Appropriate Assessment and, if necessary, an Appropriate Assessment on any plan or project for which it receives an application for consent, or which the local authority itself wishes to undertake or adopt. This implements Article 6(3) and 6(4) of the EU Habitats Directive. The 2011 Regulations apply to other activities, plans or projects affecting European sites that do not fall under the planning system. These Regulations address the requirement for Ireland to establish systems of strict protection for animal and plant species which are particularly threatened, and which are listed in Annex IV of the EU Habitats Directive. As an Annex IV species may be found throughout the country, the protection of these species is not restricted in geographical terms and is not necessarily associated with areas subject to a specific nature designation. The Third Schedule of these Regulations lists the designated invasive alien species in Ireland. Activities requiring consent (ARCs) are specific activities which have the potential to damage a SAC or a SPA. These Regulations define 38 ARCs and the procedures to follow to apply for consent and for derogations.

4.2 European Union Water Framework Directive

The European Union Water Framework Directive (2000)^{xv} identifies the supply of water as a ‘service of general interest’ in Europe. Its purpose is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters, and groundwater, to achieve ‘good’ status (both ecologically and chemically). The Directive identifies ‘River Basin Districts’ (areas of land and sea, made up of one or more neighbouring river basins, together with their associated groundwaters and coastal waters) as the main unit for management of the water resource, and requires that River Basin Management Plans^{xvi} (RBMPs) be prepared and renewed in six-year cycles. The first RBMPs covered the period 2010 to 2015.^{xvii} The second cycle plan covers the period 2018-2021 and was published by the government on 17 April 2018. The third cycle plan is currently in preparation. The Sectoral Climate Change Strategy for Water Services^{xviii} analyses impacts to biodiversity and ecological status of climate change within Ireland.

Notwithstanding that the protection of these water resources are central to the conservation of aquatic biodiversity, the EU Biodiversity Strategy to 2020 does not prioritise the implementation of the Water Framework Directive as a mechanism for achieving its aims. However, given the geographical location of Dublin City (at the downstream end of the River Basin District, and the conflux of several waterbodies), the implementation of the second cycle RBMP is at the core of achieving the aims of the Dublin City Biodiversity Action Plan 2021-2025.

4.3 European Union Marine Strategy Framework Directive

The EU Marine Strategy Framework Directive (2008) requires that European member states reach ‘good environmental status (GES)’ in the marine environment by the year 2020, which means that the seas are ‘clean, healthy and productive and that human use of the marine environment is kept at a sustainable level’. Under the EU Marine Strategy Framework Directive, marine waters must be assessed against an agreed set of standards that consider important environmental matters, including biodiversity, fish stocks and contaminants. As the core of the assessment is a set of environmental targets and indicators that must be put in place along with a programme of measures.

Under the Directive, marine waters must be assessed against an agreed set of standards across a number of important environmental areas (e.g., biodiversity, fish stocks, and contaminants). Based on the assessment, appropriate environmental targets and indicators must be put in place along with a programme of measures to reach GES.

4.4 European Union Environmental Impact Assessment Directive

The European Commission has stated that measures taken under the EIA Directive “should contribute to avoiding any deterioration in the quality of the environment and any net loss of biodiversity, in accordance with the Union's commitments in the context of the UN Convention on Biological Diversity and the objectives and actions of the European Union Biodiversity Strategy”.

The Environmental Impact Assessment (EIA) Directive (2014/52/EU) requires assessment of impacts of certain public and private projects on the environment. It was revised in 2014 to include impacts on all “biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC”. It also requires assessment of impacts to land (including soils) water, air and climate to reflect the growing importance over the last decade of these in policy-making and as they “should therefore also constitute important elements in assessment and decision-making processes”^{xix}. Under Annex III, “the environmental sensitivity of geographical areas likely to be

affected by projects must be considered, with particular regard to (a) the existing and approved land use; (b) the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground; (c) the absorption capacity of the natural environment”, with particular regard to certain types of ecosystems relevant to Dublin City. Therefore, biodiversity is a key consideration for environmental impact assessment for all phases of a project – preparation, construction, operational and demolition (if applicable).

This Plan provides information on biodiversity and policies for biodiversity conservation in Dublin City and should be referred to when scoping for Environmental Impact Assessment or preparing an Environmental Impact Assessment Report (EIAR). As a planning consent authority, Dublin City Council is required to conduct an EIA process for certain projects and to ensure that impacts on biodiversity are properly assessed prior to granting consent and that any proposed mitigation measures are suitably effective to protect biodiversity and land.

4.5 Wildlife Acts

The Wildlife Acts (1976 to 2021) provide the mechanisms to give statutory protection to Natural Heritage Areas, the protection of wild fauna and flora, the conservation of a representative sample of important ecosystems, and the services necessary to accomplish such aims. Natural Heritage Areas are those considered important for the habitats present, or which hold species of plants and animals whose habitat needs protection. Dublin City Council has five proposed Natural Heritage Areas within its administrative area, eight legally-protected animal species (in addition to those legally protected under the Habitats Directive), and ten legally-protected plant species (under the Flora Protection Order, 2015). Almost all bird species found within Dublin City are also legally protected under this legislation.

4.5 Flora Protection Order

The Flora (Protection) Order, 2015, provides legal protection to a range of flora species in the Republic of Ireland. Species listed under the Flora Protection Order cannot be cut, uprooted, or damaged, and it is illegal to sell the plant or seeds of the species. The order also extends to altering, damaging, or interfering with the habitats where the species are found, regardless of whether the location is a site designated for nature conservation.

4.6 Planning Acts

The Appropriate Assessment provision of the Habitats Directive is also transposed in Ireland by Part XAB of the Planning and Development Act 2000 (as amended) in respect of land use plans and proposed developments requiring development consent. The Planning Act provides for local authorities to make development plans for their administrative areas and the purpose for this is to ensure sustainable development. This is a key piece of legislation to protect biodiversity from threats of land use change. Through the provisions for the zoning of lands within Dublin City, Dublin City Council can also potentially address the need under the EU Habitats Directive to ensure connectivity of habitats for protected species. The Planning Act provides for the making of Local Area Plans and these include green infrastructure strategies which are an important tool for the protection and management of local biodiversity.

4.7 Climate Action and Low Carbon Development (Amendment) Bill 2021

During the process of preparing this Plan, the Government approved the final text of legislation to set Ireland on the path to net-Zero emissions no later than 2050, and to a 51% reduction in emissions by the end of this decade. The Bill states a “national climate objective” which is to support biodiversity. It includes a legal definition of biodiversity based on that of the CBD. In fulfilling their functions to achieve this objective, each Minister and the Government shall “have regard to the need to promote sustainable development and restore, and protect, biodiversity”.

Key highlights of the Bill include:

- Local Authorities must prepare individual Climate Action Plans which will include both mitigation and adaptation measures and will be updated every five years. Local Authority Development Plans must be aligned with their Climate Action Plan
- Public Bodies will be obliged to take account of Climate Action Plans in the performance of their functions

The Dublin City Biodiversity Action Plan 2021-2025 has been prepared to align with the Dublin City Climate Action Plan 2019-2024 (Table 8).

Ireland’s National Climate Objective is The State shall, so as to reduce the extent of further global warming, pursue and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy

Climate Action and Low Carbon Development (Amendment) Bill 2021

Table 8. Alignment of the Dublin City Biodiversity Action Plan 2021-2025 with the Dublin City Climate Action Plan 2019-2024

| Heading | Objective No | BSCCAP Text Objective | DCC BAP Action No |
|------------------------|--------------|---|-------------------|
| Energy and Buildings | E36 | In all building projects, new build or retrofit, Swift Bricks or other nesting sites for swifts will be provided where practicable. The presence of swift breeding sites will be identified to ensure that known breeding sites are not lost as a result of construction work | 6.2, 13.3 |
| Transport | T28-T34 | Greenway projects | 8.3 |
| Flood Resilience | F5 | Produce a new Design Guide for SuDS and green infrastructure | 12.4 |
| Flood Resilience | F9 | Develop and implement Coastal Zone Management plan for Dublin Bay | 2.3, 5.3, 17.1 |
| Flood Resilience | F10 | Implement the Dublin Bay Biosphere work programme | 2.3, 17.1 |
| Flood Resilience | F12 | Identify areas for integrated constructed wetlands | 8.4 |
| Flood Resilience | F18 | Update DLA urban drainage and flooding policies promoting natural flood measures as a priority to inform new development plan | Objective 9 |
| Flood Resilience | F33 | Santry River Regeneration Project | 8.2 |
| Flood Resilience | F35 | Study impacts and benefits of increased buffer distances to watercourses | 8.3 |
| Flood Resilience | F36 | Promote and encourage community involvement in the retrofit of SuDS in existing developments | 12.4 |
| Flood Resilience | F38 | Environmental surveys of all City rivers and estuaries as baseline surveys | 4.6, 8.3 |
| Nature-Based Solutions | N1-N41 | All | Various |

5. Key policies

The Dublin City Biodiversity Action Plan does not operate in isolation for the protection of biodiversity in Dublin City. There are other policies, operating locally, which contribute to the protection of biodiversity. Significantly, however, the Dublin City Biodiversity Action Plan forms part of a global objective to protect biodiversity.

5.1 United Nations Convention on Biological Diversity

The UN Convention on Biological Diversity^{xx} (CBD) is an international agreement for signatory nations – including Ireland – to recognise and halt biodiversity loss. It is the main instrument for countries to work together in partnership with the understanding that biodiversity does not recognise political boundaries and that we are in a global crisis. The CBD underpins European and Irish policies and legislation on biodiversity. It provides the agreed international definition of biodiversity.

"Biological diversity" means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems.

UN Convention on Biological Diversity (CBD) (1992)

This Plan contains specific objectives and actions to ensure no net loss in Dublin City and is in line with national and European policies and legislation under the CBD. It includes actions for cooperation with other nations in the interests of conserving biodiversity, particularly through the World Network of Biosphere Reserves under the UNESCO Man and the Biosphere programme (5.1.3).

5.2 United Nations Sustainable Development Goals

In September 2015, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development, which included the Sustainable Development Goals (SDGs)¹. The SDGs are 17 interconnected goals which provide a global framework for ending poverty, inequality and ensuring sustainable development by 2030. The SDGs apply equally to every country and can only be achieved if all sectors of society including Government, Civil Society, the Private Sector, local communities, and individual citizens, draw on each other's strengths and work together towards achieving the Goals. This Plan includes specific actions with implement eight of the SDG goals (Table 9).

¹ United Nations (UN) (2015) Transforming Our World: The 2030 Agenda for Sustainable Development. Seventieth Session of the United Nations General Assembly Resolution A/RES/70/1. UN, New York.

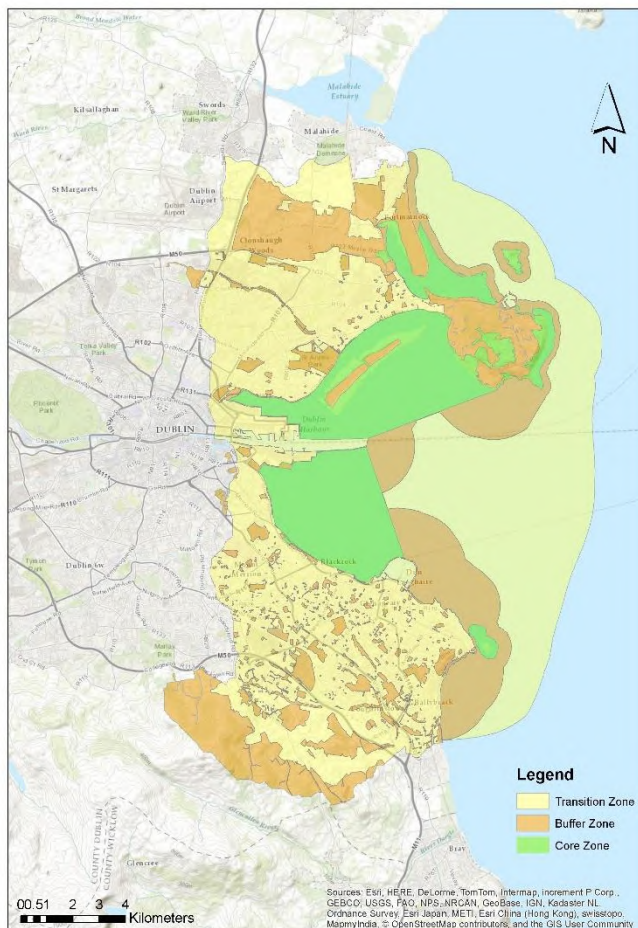
Table 9: Alignment of SDGs with actions of the Dublin City Biodiversity Action Plan.

| SDG No. | SDG Goal | BAP Actions |
|---|---|---|
|  | Quality Education | 15.1, 15.2, 15.3, 15.4 |
|  | Clean Water and Sanitation | 12.4 |
|  | Industry, Innovation and Infrastructure | Theme 3 |
|  | Sustainable Cities and Communities | All Actions |
|  | Climate Action | 1.1, 5.1-5.5, 8.1-8.7, 9.1-9.4, 10.1, 10.3, 11.2, 12.1-12.5, 15.1-15.3, 16.1-16.3, 17.1, 17.2 |
|  | Life below Water | 2.1, 4.4, 8.2, 8.5, 8.6 |
|  | Life on Land | Majority of actions in Themes 2 and 3 |
|  | Partnerships for The Goals | Theme 5 and All Actions involving partners to DCC |

5.3 UNESCO Man and the Biosphere (MAB) Programme

Dublin Bay is a UNESCO Biosphere Reserve. The World Network of Biosphere Reserves (WNBR) consists of a dynamic and interactive network of 714 sites in 129 countries. It works to foster the harmonious integration of people and nature for sustainable development through participatory dialogue, knowledge sharing, poverty reduction, increased human well-being, respect for cultural values and enhanced capacities to cope with Climate Change. They are ideal places to explore innovative approaches to conservation and sustainable development and can play a key role in achieving the SDGs by providing local solutions to global challenges.

In 1981, UNESCO recognised the importance of Dublin Bay by designating North Bull Island as a Biosphere Reserve because of its rare and internationally important habitats and species of wildlife. To support sustainable development, 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. To fulfil these broader aims for ecosystem management, the Biosphere was extended in 2015 to cover all of Dublin Bay, reflecting its significant environmental, economic, cultural and tourism importance. Over 300,000 people live within the newly enlarged Biosphere - an area of over 300km².



In keeping with UNESCO biosphere reserve criteria, Dublin Bay UNESCO Biosphere Reserve contains three different zones, which are managed in different ways:

- The core zone of Dublin Bay Biosphere comprises 50km² of areas of high natural value. Within Dublin City, this comprises the Natura 2000 sites of Dublin Bay and North Bull Island.
- The buffer zone comprises 82km² of public and private green spaces such as parks, greenbelts and golf courses, which surround and adjoin the core zones.
- The transition zone comprises 173km² and forms the outer part of the Biosphere. It includes residential areas, harbours, ports and industrial and commercial areas.

Figure 7: Map of the zonation of the Dublin Bay UNESCO Biosphere.

The Dublin Bay UNESCO Biosphere has been recognised nationally as a case study in the Ireland's Biodiversity Sectoral Climate Change Adaptation Plan (2019)^{xxi}.

5.4 United Nations Decade on Ecosystem Restoration (2021-2030)

The UN Decade on Ecosystem Restoration^{xxii} will be launched on World Environment Day, 5 June 2021. It aims to prevent, halt and reverse the degradation of ecosystems on every continent and in every ocean. It can help to end poverty, combat climate change and prevent a mass extinction. Dublin City will meet the UN's call for everyone to play a part through specific actions of this Plan. Dublin Bay has seagrass habitats of international importance. The UN has called for action to restore these worldwide due to their importance as keystone communities that support life for a range of species both above and below water. Seagrasses have a greater capacity to store carbon than terrestrial forests, improve water quality, and can protect communities through buffering storm surges and preventing erosion. Yet they are under threat from a combination of climate change, coastal development, and pollution. Work commenced under the previous Dublin City Biodiversity Action Plan to assess seagrasses in Dublin Bay and will be expanded in this Plan. The UN initiative is particularly focused on urban ecosystems, where the majority of the world's population lives, and their role in supporting biodiversity and our quality of life. It highlights the need to combat degradation of soils through urban development and calls for citizens to take the initiative to restore rivers, plant trees and make space for wildlife in cities. It urges governments to place green spaces at the heart of urban planning and to create new green spaces from former industrial areas. It has highlighted the Cities4Forests Initiative^{xxiii}, of which Dublin City is a member.

Dublin City will join the Green City Accord in line with the EU Biodiversity Strategy 2030 and the European Covenant of Mayors.
European Union Biodiversity Strategy 2030

5.5 European Union Biodiversity Strategy 2030 - Bringing nature back into our lives

The EU Biodiversity Strategy to 2030^{xxiv} was launched in May 2020 to provide targets for all member states within the European Union to address the biodiversity crisis. It links the recovery of biodiversity to recovery from economic recession, health threats and climate disasters. "We need nature in our lives" is a central message. Investing in nature protection and restoration will also be critical for Europe's [and Dublin's] economic recovery from the COVID-19 crisis.

The Strategy notes that the five main direct drivers of biodiversity loss – changes in land and sea use, overexploitation, climate change, pollution, and invasive alien species – are making nature disappear quickly globally and across the European Union. All of these are affecting Dublin's biodiversity. Dublin, in common with other cities, requires goods and services from other places and we have a responsibility to ensure that we are not driving biodiversity loss elsewhere to meet our needs. Each city has its own 'ecological footprint', and the Strategy requires that this be reduced for cities in the EU.

In the Strategy, the European Commission has stated that "Nature is a vital ally in the fight against climate change". Nature regulates the climate, and nature-based solutions, such as protecting and restoring wetlands and coastal ecosystems, or sustainably managing marine areas, woodlands, grasslands and reducing sealing of soils, will be essential for emission reduction and climate adaptation. Planting trees and deploying green infrastructure will help us to cool urban areas and mitigate the impact of natural disasters. The EU Biodiversity Strategy includes high-level goals to have a coherent network of protected areas - at least 30% of the land and 30% of the sea should be

protected in the EU. Another goal is to implement an EU Nature Restoration Plan for restoring ecosystems across land and sea with the following list of Key Commitments relevant to Dublin City to be implemented by 2030 (below).

To facilitate this work, the Commission will in 2021, set up an EU Urban Greening Platform, under a new 'Green City Accord' with cities and mayors. This will be done in close coordination with the European Covenant of Mayors. The Urban Greening Plans will have a central role in choosing the European Green Capital 2023 and European Green Leaf 2022.

Protecting and restoring nature will need more than compliance with regulations alone. It will require action by citizens, businesses, social partners and the research and knowledge community, as well as strong partnerships in Dublin City between local, regional, national and European levels. Dublin City is a research centre within the European Union and has the potential to be a European leader in meeting the goals of the EU Biodiversity Strategy for 2030 and avail of funding through the European Green Deal to support implementation.

Key Commitments to be implemented by 2030 across the European Union:

- Legally binding EU nature restoration targets to be proposed in 2021, subject to an impact assessment. By 2030, significant areas of degraded and carbon-rich ecosystems are restored; habitats and species show no deterioration in conservation trends and status; and at least 30% reach favourable conservation status or at least show a positive trend.
- The decline in pollinators is reversed.
- The risk and use of chemical pesticides are reduced by 50% and the use of more hazardous pesticides is reduced by 50%.
- Three billion new trees are planted in the EU, in full respect of ecological principles.
- Significant progress has been made in the remediation of contaminated soil sites.
- At least 25,000 km of free-flowing rivers are restored.
- There is a 50% reduction in the number of Red List species threatened by invasive alien species.
- Cities with at least 20,000 inhabitants have an ambitious Urban Greening Plan.
- No chemical pesticides are used in sensitive areas such as EU urban green areas.
- The negative impacts on sensitive species and habitats, including on the seabed through fishing and extraction activities, are substantially reduced to achieve good environmental status.

European Union Biodiversity Strategy 2030

5.6 European Union Soils Strategy – “Healthy soil for a healthy life”

The EU Biodiversity Strategy for 2030 announced the update of the 2006 EU Soil Thematic Strategy to address soil and land degradation in a comprehensive way and to help achieve land degradation neutrality by 2030. The Biodiversity Strategy for 2030 highlights that it is essential to step up efforts to protect soil fertility, reduce erosion and increase soil organic matter. Significant progress is also needed on identifying contaminated sites, restoring degraded soils, defining the conditions for their good ecological status and improving the monitoring of soil quality. The European Commission has stated that “soils are essential ecosystems that deliver valuable services such as the provision of food, energy and raw materials, carbon sequestration, water purification and infiltration, nutrient regulation, pest control and recreation. Therefore, soil is crucial for fighting climate change, protecting human health, safeguarding biodiversity and ecosystems and ensuring food security”.

The European Union Parliament passed a Resolution on soil protection^{xxv} in April 2021 calling for an EU Soils Strategy as an overarching framework and a way to reach the objectives:

- Step up efforts to protect soil fertility and reduce soil erosion
- Increase soil organic matter and restore carbon-rich ecosystems
- Protect and enhance soil biodiversity
- Reduce the rate of land take, urban sprawl and sealing to achieve no net land take by 2050
- Progress in identifying and remediating contaminated sites and address diffuse contamination
- Address the growing threat of desertification
- Achieve land degradation neutrality by 2030.

This Plan includes themes, objectives, and actions to restore ecosystems, advance knowledge of soil degradation, and promote public awareness in Dublin City.

5.7 European Union Green Infrastructure Strategy – ‘Enhancing Europe’s Natural Capital’

The EU has prepared a Green Infrastructure Strategy (GI)^{xxvi} with biodiversity protection as a primary objective. The Strategy is accompanied by a Technical Document^{xxvii}. Green infrastructure maintains ecosystem functions. The Strategy promotes green infrastructure as a means to boost resilience from vulnerable extreme weather events and natural disasters. Cities and local authorities are the first to deal with the immediate consequences of such disasters and, therefore, play a critical role in implementing prevention measures such as GI. The EU has highlighted the importance of Green Infrastructure also as a contribution to further integrating biodiversity considerations into other EU policies. In a somewhat prescient sense, the EU states that:

“GI solutions are particularly important in urban environments in which more than 60 % of the EU population lives. GI features in cities deliver health-related benefits such as clean air and better water quality. Healthy ecosystems also reduce the spread of vector-borne diseases”.

Thus, the link is made between ecosystem function and human health. The Strategy states that GI is a successfully tested tool for providing ecological, economic, and social benefits through nature-based solutions. It helps us to understand the value of the benefits that nature provides to human society and to mobilise investments to sustain and enhance them – the ecosystem services that we need to

survive. This Plan includes specific actions that promote green infrastructure and the EU GI Strategy elements, namely:

- Promoting GI in the main policy areas
- Improving information, strengthening the knowledge base and promoting innovation

5.8 National Biodiversity Action Plan 2017-2021

As a signatory to the Convention on Biological Diversity, Ireland must prepare and update regularly a National Biodiversity Action Plan (NBAP), as a national policy framework to prevent biodiversity loss. The national policy framework for biodiversity in Ireland is the National Biodiversity Action Plan (NBAP). The NBAP 2017-2021, which is the third such plan, sets out the objectives, targets, and actions for biodiversity to be undertaken by government, civil and private sectors to achieve Ireland's Vision for Biodiversity, namely:

“That biodiversity and ecosystems in Ireland are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally.”

The NBAP 2017-2021 details seven strategic objectives to achieve this vision:

1. Mainstream biodiversity into decision-making across all sectors
2. Strengthen the knowledge base for conservation, management, and sustainable use of biodiversity
3. Increase awareness and appreciation of biodiversity and ecosystem services
4. Conserve and restore biodiversity and ecosystem services in the wider countryside
5. Conserve and restore biodiversity and ecosystem services in the marine environment
6. Expand and improve management of protected areas and species
7. Strengthen international governance for biodiversity and ecosystem services

The plan further details 15 targets and 119 actions, with 16 actions specifically for Local Authorities. The preparation of the Dublin City Biodiversity Action Plan is an action of, and the tool for the implementation in Dublin City of, the National Biodiversity Action Plan. Therefore, the Dublin City Biodiversity Action Plan is aligned closely with the objectives of the NBAP (see Table 10 – below).

Local Authorities should review and update their Biodiversity and Heritage Action Plans as well as their Development Plans and policies, which should include policies and objectives for the protection and restoration of biodiversity.

Ireland's National Biodiversity Action Plan
(2017)

At the time of writing, a review of the National Biodiversity Action Plan 2017-2021 is underway. The implementation of the National Biodiversity Action Plan is monitored by the National Biodiversity Forum, which is comprised of biodiversity experts from across academia, NGO, public and private sectors. In February 2021, the Forum published an independent review of Ireland's third National Biodiversity Action Plan 2017-2021 (Group, 2020). Elements from this review, such as protecting, recovering, and renewing biodiversity and ecosystems; building the biodiversity knowledge base;

engaging with communities; and aligning to the UN Sustainable Development Goals were considered when writing this Plan. The next National Biodiversity Action Plan 2022-2026 is expected in 2022.

Table 10. Alignment with the National Biodiversity Action Plan 2017-2021

| NBAP Heading | NBAP Objective No | NBAP Text Objective | DCC BAP Action No |
|--|-------------------|--|--|
| Mainstream biodiversity into decision-making across all sectors | 1.1.2. | Public and Private Sector relevant policies will use best practice in SEA, AA and other assessment tools to ensure proper consideration of biodiversity in policies and plans | 2.1 |
| | 1.1.3. | All Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure | 12.1-12.5 |
| | 1.1.4. | Strengthen ecological expertise in local authorities and relevant Government Departments and agencies | DCC maintains 2 full-time ecologists |
| | 1.1.5. | Local Authorities will review and update their Biodiversity and Heritage Action Plans | 1.1 |
| | 1.1.6. | Local Authorities will review and update their Development Plans and policies to include policies and objectives for the protection and restoration of biodiversity | 1.1 |
| | 1.1.7. | Develop a Green Infrastructure at local, regional and national levels and promote the use of nature-based solutions for the delivery of a coherent and integrated network | 12.3 |
| | 1.1.8. | Continue to produce guidance on the protection of biodiversity in designated areas, marine and the wider countryside for Local Authorities and relevant sectors | 11.1, 11.2 |
| | 1.1.14. | Implement actions from Ireland's Biodiversity Sectoral Climate Change Adaptation Plan | Ref Table on BSCCAP |
| Strengthen the knowledge basis for conservation, management, and sustainable use of biodiversity | 2.1.6. | Undertake surveys and assessments of status, trends and distribution of all habitats and species of EU interest and additional habitats and species of national and regional importance | 2.1-2.8, 3.1-3.5, 4.1-4.11, 5.2, 6.1, 6.3, 6.5, 6.6, 6.7 |
| | 2.1.7. | Support and encourage the volunteer network and local communities to carry out biological recording and other citizen science projects | 4.3, 6.2, 6.5, 15.3, 16.1, 16.3 |
| | 2.1.12. | Hedgerow surveys will be continued by Local Authorities | 3.3 |

| NBAP Heading | NBAP Objective No | NBAP Text Objective | DCC BAP Action No |
|---|-------------------|--|---|
| Increase awareness and appreciation of biodiversity and ecosystem services | 3.1.1. | Engage with local communities and stakeholders to help achieve the objectives of this plan | All Actions |
| | 3.1.2. | Enhance training, communication, cooperation and concerted action between relevant sectors in support of biodiversity conservation | 4.3, 7.3, 9.3, 10.2, 12.1, 15.5, 17.3-17.5 |
| | 3.1.7. | Develop and implement a communications campaign in support of public and sectoral understanding of the value of biodiversity and full implementation of this NBAP | 10.2, 15.5, 17.3 |
| Conserve and restore biodiversity and ecosystem services in the wider countryside | 4.1.8. | Implement the All-Ireland Pollinator Plan including: making the Irish countryside more pollinator friendly; raising awareness of pollinators; supporting beekeepers and growers; expanding knowledge of pollinators; and collecting evidence to track changes | 9.2 |
| | 4.2.1. | Continue to protect, enhance and monitor the ecological status of water during the second cycle of the Water Framework Directive (2015-2021) including reducing risks to water quality and utilising ecological expertise in decision-making, and in analysis of cumulative effects | 2.1, 8.1-8.5, 12.3 |
| | 4.4.2. | Develop national and whole island plans to implement the EU Invasive Alien Species (IAS) Regulation and relevant sections of Ireland's EU (Birds and Natural Habitats) Regulations 2011 including: development and adoption of biosecurity plans in relevant state bodies; a Rapid Response Protocol for the island of Ireland; coordination and collation of invasive species surveillance and monitoring data; and work with Northern Ireland and UK authorities on invasive species of mutual concern | 10.1-10.3 |
| | 4.4.3. | Continue and enhance measures for eradication, where feasible, control and containment of invasive species | 10.1-10.3 |
| | 4.4.4. | Encourage horticultural nurseries to produce native species, varieties and landraces from appropriate native sources for public and private sector plantings. Public bodies will endeavour to plant native species in order to reduce importation of non-native species, varieties and landraces | 7.3-7.5, 9.2, 11.1, 11.2, 12.1 |
| | 5.1.2. | Implement measures to achieve good ecological and environmental status of marine and coastal habitats as required by the Habitats, Directive, Water Framework Directive and Marine Strategy Framework Directive (MSFD) and in line with the OSPAR Convention (Convention for the protection of the marine environment in the North-East Atlantic) | 2.1, 2.6, 4.6-4.10, 8.1-8.6, 9.4, 10.1-10.3, 12.3 |

| NBAP Heading | NBAP Objective No | NBAP Text Objective | DCC BAP Action No |
|--|-------------------|--|--|
| Conserve and restore biodiversity and ecosystem services in the marine environment | 5.1.4. | Promote the incorporation of ecological engineering features in new and existing structures such as coastal defences | 13.1-13.3 |
| Expand and improve management of protected areas and species | 6.1.2. | Develop and utilise licensing and consent systems to facilitate sustainable activities within Natura 2000 sites | 2.1 |
| | 6.1.4. | Manage National Parks and Nature Reserves to a high standard | 2.1-2.5, 17.1 |
| | 6.1.7. | Implement the conservation measures necessary to achieve the published conservation objectives for Natura 2000 sites. Develop and implement additional measures as necessary to achieve favourable conservation status both nationally and at site level | 2.1-2.5, 17.1 |
| | 6.2.1. | Increase connectivity of the protected areas network using appropriate buffer zones, corridors, steppingstones and/or flyways | 2.1-2.4, 2.7-2.8, 3.1, 3.3, 4.6, 8.3, 12.3, 17.1 |

5.9 Ireland's Biodiversity Sectoral Climate Change Adaptation Plan (BSCCAP) and the Dublin City Climate Change Action Plan

Dublin City provides habitats for species which are increasingly under threat due to climate change – migratory birds from the Arctic, breeding migratory birds from Africa, butterflies, plants which are disappearing in other parts of Europe. Climate change is resulting in a north-westerly shift of some species – such as birds and butterflies - across Europe, with new arrivals in Dublin to be expected in the coming years. Increasing temperatures, droughts and sea level rise are all anticipated changes which will affect Dublin's biodiversity.

There are several key climate change policies that are informing the Dublin City Biodiversity Action Plan. The first is Ireland's Biodiversity Sectoral Climate Change Adaptation Plan^{xxviii}, which points out that biodiversity is not a sector, it cuts across all State services. It identifies the impacts of climate change on biodiversity in Ireland as:

- Changes in phenology – the timing of seasonal changes for wildlife and their life cycles
- Changes in the geographical range of species
- Changes in species abundance
- Increased degradation of habitats and changes in ecosystem processes
- Increased occurrence of invasive species

There are specific actions in it that seek cooperation from local authorities for implementation. The Dublin Bay UNESCO Biosphere has been recognised as a case study in the Biodiversity Sectoral Climate Change Adaptation Plan (2019) for addressing climate change adaptation.

The other main policy is the Dublin City Climate Action Plan 2019-2024^{xxix}, which identifies impacts to biodiversity in Dublin City from climate change risks including: extreme weather events, sea level rise and flooding. It includes actions for biodiversity across several themes, including nature-based solutions, flood resilience, energy, and buildings.

The development of this Plan has been prepared to align with both of these Plans.

Table 11. Alignment of the Dublin City Biodiversity Action Plan with the Biodiversity Sectoral Climate Change Adaptation Plan

| Objective No | BSCAP Text Objective | DCC BAP Action No |
|--------------|---|-------------------------------------|
| 1.1 | Resource and implement the National Biodiversity Action Plan 2017-2021 in full | 1.1 |
| 1.2 | Enhance and restore natural systems through management to increase resilience—starting with hydrological processes (freshwater and marine), carbon processes and pollination {e.g. use OPW flood maps (see www.floodinfo.ie) to assess the exposure of known habitats/ Natura sites to current and future flood risk and update of the site management plans to ensure steps are taken to adapt/ restore bog lands to increase their role in carbon sequestration and to increase their resilience to drying associated with temperature rise} | 5.1, 5.3, 8.1-8.6, 9.2, 9.4 |
| 1.3 | Establish an all-island invasive species programme to monitor the spread of terrestrial, aquatic and marine invasive species in a changing climate and control invasive species where their spread is considered problematic | 10.1-10.3 |
| 1.5 | Develop an integrated coastal management strategy which includes ecosystem-based adaptation actions to manage climate risk and build resilience to climate change | 5.3 |
| 2.2 | Monitor on an ongoing basis the current impacts of climate change on biodiversity (marine, terrestrial, and freshwater) | 5.1, 5.3 |
| 2.6 | Collect information on biodiversity and ecosystem-based adaptation actions being implemented in Ireland and store this information centrally to facilitate lesson learning and experiences sharing | 12.2 |
| 3.2 | Identify vulnerable ecosystems and species that through enhanced landscape connectivity would be less impacted by climate change | 5.1, 6.1 |
| 3.3 | Design corridors and buffer zones to enhance the resilience of protected areas and designated sites by increasing opportunities for dispersal across the landscape (e.g., as employed in Killarney NP and Dublin Bay) | 8.3, 12.1, 12.3, 12.5 |
| 3.4 | Implement measures to reduce the barrier effects of roads, railways and technical objects in rivers and streams to facilitate species spatial responses to climate change | 8.2, 8.3, 8.5, 9.4, 11.2, 12.1-12.5 |
| 4.1 | All sectors systematically consider nature-based solutions as potential low cost, win-win climate change adaptation and mitigation solutions and report on relevant action as part of the review of this and other sectoral adaptation strategies | 8.2, 9.1-9.4, 12.4 |
| 4.2 | Design and implement a citizen engagement and awareness campaign on climate change and biodiversity conservation to capture case studies, tell stories and engage citizens in data collection and monitoring | 15.1, 15.3, 15.5, 16.1 |
| 4.3 | Co-design green spaces and wildlife refuges in cities and peri-urban areas with local communities to provide habitats for species under threat from climate change and to connect people to biodiversity. | 8.7, 12.5 |

| | | |
|-----|--|-----------|
| 4.5 | Build and strengthen partnerships and promote cross-sectoral communication Biodiversity working Group, and cooperation in the implementation of adaptation and planning | 17.1-17.6 |
| 4.6 | Use the National Biodiversity Conference and other fora to engage stakeholders in all sectors to protect biodiversity in order to increase resilience to climate change | 17.3 |
| 5.3 | Undertake natural capital accounting in all sectors to ensure natural capital is being valued and Ecosystem Based Adaptation and green infrastructure options are being employed | 9.3, 17.6 |

5.10 River Basin District Management Plan

Dublin City was established because of its harbour at Dublin Bay and grew around its central river, the Liffey. The rivers of Dublin are core to its identity and have been central to commerce for centuries. Dublin Port is Ireland's major port. Under the EU Water Framework Directive (WFD), Ireland is managed as a single River Basin District and there is a national programme of Areas of Action. Within Dublin City, the prioritised waterbodies are the Santry/Mayne River and the Dodder River Sub-catchments. The Water Framework Directive sets out to achieve good status of waterbodies in terms of ecological, physical, and chemical status. Delivery of the objectives for each catchment are through a Programme of Measures which include those for ecological status. This Plan includes specific objectives and actions for all rivers, and in particular for prioritised waterbodies. It provides support for implementation of the WFD within Dublin City and for groundwater-dependent terrestrial ecosystems which occur at North Bull Island. The WFD includes requirements for protected areas, and these are the Natura 2000 sites with Dublin City. A major aspect of the WFD and its implementation in Ireland is citizen engagement and this Plan will promote this with respect to certain species and habitats of relevance to the WFD. The conservation of biodiversity in Dublin City is heavily affected by water quality and complementarity of this Plan with respect to invasive alien species, SUDS and climate change are all addressed through engagement in its preparation with the WFD Office of Dublin City Council, LAWPRO, inland Fisheries Ireland and the Climate Action Regional Office (CARO).



The Santry River is a prioritised waterbody and river restoration is planned (Photo: Anthony Woods).

5.11 Regional Spatial and Economic Strategy (RSES)

The Eastern & Midland Regional Assembly (EMRA) has prepared the Regional Spatial & Economic Strategy (RSES) (2019-2031) which guides regional development and the Dublin City Development Plan. The RSES contains the Regional Policy Objectives (RPOs) which relate to the actions of local authorities for biodiversity, particularly in the chapters on biodiversity, green infrastructure, landscape and climate change. These have informed the actions of this Plan and the alignment of 7 RPOs with 45 specific actions in the Plan are listed in Table 12 below.

Table 12. Alignment with Regional Spatial & Economic Strategy (RSES) (2019-2031)

| RSES Heading | Regional Policy Objective No. | Regional Policy Objective | DCC BAP Action No |
|-----------------------------------|-------------------------------|--|------------------------------------|
| Biodiversity and Natural Heritage | 7.16 | Support the implementation of the Habitats Directives in achieving an improvement in the conservation status of protected species and habitats in the Region and to ensure alignment between the core objectives of the EU Birds and Habitats Directives and local authority development plans. | 2.1-2.8, 4.1., 4.2, 4.4-4.8, |
| | 7.17 | Facilitate cross boundary co-ordination between local authorities and the relevant agencies in 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. | 10.1-10.2, 17.4 |
| | 7.20 | Promote the development of improved visitor experiences, nature conservation and sustainable development activities within the Dublin Bay Biosphere in cooperation with the Dublin Bay UNESCO Biosphere Partnership. | 2.1-2.8, 4.1., 4.2, 4.4-4.11, 17.1 |
| Ecosystem Services Approach | 7.21 | Local authorities shall promote an Ecosystem Services Approach in the preparation of statutory land use plans. | 9.1, 9.3, |
| Green Infrastructure | 7.22 | 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. | 12.3-12.5 |
| Greenways, Blueways and Peatways | 7.24 | 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, notwithstanding that capacity of a greenway is limited to what is ecologically sustainable. | 8.3 |
| Riparian setbacks | 7.26 | Support the development of guidance for assessment of proposed land zonings in order to achieve appropriate riparian setback distances that support the attainment of high ecological status for waterbodies, the conservation of biodiversity and good ecosystem health, and buffer zones from flood plains. | 8.1, 8.2 |

5.12 Dublin City Development Plan

The outcomes of the Dublin City Biodiversity Action Plan 2015-2020, including the Dublin City Habitat Map and various baseline surveys – are informing the forthcoming Dublin City Development Plan 2021-2026. The Theme of ‘Building for Biodiversity’ in this Plan will promote sustainable development and assist in the preparation of policies and objectives for biodiversity in the City Development Plan. The Planning Act and Regulations also include for specific legislative requirements to protect the environment and how it is shaped. The City Development Plan is a tool for controlling development and for setting of development standards – both of which are necessary for conservation of the high biodiversity in Dublin City. As many species in Dublin increasingly rely on the built environment due to loss of their natural habitats, there is a potential role for designers and planners to address biodiversity loss and provide purposeful supports in their schemes. Such artificial habitats can provide vital ways to maintain populations of conservation concern.

The Dublin City Development Plan 2016-2022^{xxx} includes an Environmental Policy Objective: “To protect and, where appropriate, enhance the diversity of habitats, species, ecosystems and geological features”. It includes a definition of, and a specific chapter on Green Infrastructure (Chapter 10) which contains policies and objectives to protect and enhance biodiversity. This Plan has been prepared with reference to these to ensure consistency with existing policies and objectives of Dublin City Council, along with the indicators and the Strategic Environmental Assessment that form the basis for future actions, such as monitoring target species and their population changes.

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.

5.13 Dublin City Invasive Alien Species Action Plan

The Dublin City Invasive Alien Species Action Plan 2016-2020 was prepared as an action of the Dublin City Biodiversity Action Plan 2015-2020 to ensure implementation by Dublin City Council of the EU Invasive Alien Species Regulations (2014). Strategies for control of Invasive Alien Species (IAS) have been in place in Dublin City to deal with certain species since 2007 under the first Dublin City Biodiversity Action Plan 2008-2012, and they have achieved a certain amount of success. In some cases, management strategies can build upon what is already in place, in others a new start and new ways of thinking will be necessary. Monitoring of control work is a vital part of the plan. There are seventeen legally-designated species of IAS currently known to be present in Dublin City. These are risk-assessed in the IAS Action Plan, with specific protocols given on their control. This Plan includes an objective and specific actions for IAS management under the theme of Restoring Ecosystems in line with the EU Biodiversity Strategy 2030.

5.14 Dublin City Parks Strategy

As stated in the Dublin City Parks Strategy 2019-2022, there are several policies which guide the daily operations of Dublin City Council, and which will be important for the successful implementation of this Plan. These policies are as follows:

1. To ensure parks management practices prioritise the protection of habitats for threatened species and for protection of rare species and habitats in our parks.
2. To protect genetic biodiversity by planting only native species of Irish provenance (where available) in areas of high ecological importance, including river corridors and coastal habitats.
3. To manage parks, open spaces, and cemeteries as a connected network of green infrastructure that provides habitats of international importance for protected species and sustain ecosystems.
4. Biodiversity initiatives that are specific to the protected habitats and species will be developed for all public green spaces, which are hubs supporting core areas. These will be prepared with reference to the management plans for the core areas.
5. To ensure that corridors are maintained throughout the Dublin City Council administrative area as continuous elements of green infrastructure to afford passage for wildlife and prevent severance of habitats by 'grey' infrastructure. To work to restore connectivity of corridors where insensitive development has taken place previously, or where there are opportunities to work cooperatively with landowners to promote this.
6. To continue to work to enable NGOs to implement national strategies for nature conservation, through public parks and open spaces.
7. Dublin City Council will, in association with its partners, assist with achieving the goals of conservation, learning, and development of the Dublin Bay UNESCO Biosphere Reserve.

5.15 Dublin City Tree Strategy

Trees in Dublin City form a major component of its biodiversity and provide vital supports for life in the urban ecosystem. Trees regulate climate and hydrological flows, fix nitrogen and take up soil nutrients and pollutants, sequester carbon, filter rainfall, absorb air pollution, reduce wind speeds and provide shelter and food for wildlife. The woodlands, hedgerows, tree-lines and trees in parks and gardens are vital habitats for the survival of many of our most threatened species. Trees shade watercourses, maintaining cool temperatures for our protected species of fish, such as salmon and trout. They provide resting and nesting areas for birds of European conservation importance, such as Kingfisher, and for bats, which are also protected at European level. Conserving and planting trees is a significant support for biodiversity and climate change. Several native species are threatened by plant diseases and invasive alien species. Therefore, the actions of the Dublin City Biodiversity Action Plan are also supportive of tree health.

The Dublin City Tree Strategy includes specific policies to support biodiversity, including:

- *“3.2.3 Protection of Trees that are a habitat for endangered species: Dublin City Council will use its powers to protect trees that are a potential habitat for (or used by) protected species.*

The Council will have regard to legislative requirements and the procedures outlined in the Council's Biodiversity Action Plan.

- *3.2.4 Trees that function as wildlife corridors: Dublin City Council will protect trees, hedgerows or groups of trees which function as wildlife corridors or 'steppingstones' in accordance with Article 10 of the EU Habitats directive and the procedures outlined in the Council's Biodiversity Action Plan.*
- *3.2.5 Ancient and Species Rich Hedgerows: The City Council will 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.*
- *3.6.6 Protected species: Where tree works have the potential to affect protected species or their habitat, the Council will have regard to legislative requirements and the procedures outlined in the Council's Parks Biodiversity Policy.*
- *3.6.7 Ivy on trees Ivy on trees is normally retained except where removal is necessary to aid visual tree health assessment or where ivy growth is excessive and adversely affecting tree health.*
- *3.6.8 Standing deadwood: Where it is safe and appropriate to do so, standing deadwood will be left in situ to provide a habitat for native species and contribute to local biodiversity.*
- *3.8.6 Species Selection: The choice of tree species is dependent on suitability to the planting location and local landscape character. A greater variety of trees can be planted in parks and open spaces than on streets and species will be selected on suitability to setting, biodiversity value and visual appearance.*
- *3.8.7 Large Canopied Trees: The Council will also seek to plant large canopy trees, wherever possible, to achieve the maximum benefits that trees provide. Large-growing tree species confer much greater benefits to urban areas than small trees. Where space allows, preference will be given to planting as large a tree as is appropriate for the location.*
- *3.9.2 Volunteers: The Council will examine opportunities to encourage and facilitate the work of volunteers with the aim of raising local tree awareness.*
- *3.9.3 Education and awareness: The Council, through education, will aim to raise the awareness and appreciation of trees. This includes Native Tree Trails".*

The Dublin City Tree Strategy is currently being updated and will align with this Plan to ensure that these policies are continued.

5.16 Dublin City Draft Sustainable Urban Drainage Systems (SUDS) Guidelines

There has been an increasing awareness over recent years that traditional piped drainage does not manage rainfall sustainably in cities. During the 1970s, the realisation of this and the levels of water pollution in the USA generated a new approach to managing rainfall that mimics natural drainage. These new ideas were also being developed in Europe and were introduced initially into Ireland in the late 1990s. The concepts, techniques, and terminology of this new approach, including the term 'Sustainable Urban Drainage Systems' (SuDS), were introduced at this time. The three components of SUDS are: biodiversity/amenity, water quality and water quantity.

Climate change means that rainfall patterns are changing, and storms are becoming steadily more severe. Existing streets, car parks and other urban surfaces are still collecting pollution and releasing it when it rains directly into our watercourses, which causes impacts for wildlife such as erosion of habitats and poor water quality. Pollution from roofs, roads and car parks is washed into the sewer when it rains, contaminating streams, rivers and the sea and killing wildlife. Wildlife is often trapped and killed by conventional drainage structures. Dublin City needs to manage rainfall that falls on its

existing hard surfaces in a more sustainable way. Therefore, Dublin City Council is preparing its first SUDS Guidelines, which can support biodiversity opportunities for wildlife, clean water, connectivity, and habitat design^{xxxi}.

5.17 Dublin City Heritage Plan

There are rich linkages between natural and cultural heritage, particularly in an older city such as Dublin. Protected built heritage sites can often also be important for biodiversity due to their lack of disturbance and less intensive maintenance, such as graveyards and national monuments. Traditional building methods often have afforded opportunities for wildlife to shelter in. Modern materials and methods of construction can often be detrimental to both built and natural heritage. Areas where climate change risk is highest may be important for both built and natural heritage. Habitats and their management may be a product of cultural practices and associations that we wish to preserve. Use of sustainable methods of management can be beneficial for heritage overall. There can also be challenges in balancing heritage conservation objectives. For example, the industrial heritage of our rivers is a part of the city's history, but it can impede passage of fish and other wildlife.

At the time of writing, the Dublin City Heritage Plan 2021-2025 is in preparation. It is required under the National Biodiversity Action Plan to ensure alignment of local authority biodiversity action plans and heritage plans. The Heritage and Biodiversity Sections of Dublin City Council have reviewed this Plan together to ensure such alignment and several specific actions are included to promote this in terms of addressing climate change impacts, raising awareness, education, citizen science and building for biodiversity. The UNESCO Man and the Biosphere Programme promotes linkages of natural and cultural heritage through links with other UNESCO programmes and policies on culture, language, literature and traditional crafts and materials.



A heritage building with open bricks under the top building edge to allow swifts to nest (Photo: Maryann Harris).

APPENDIX 1

Tables 1-3 below, detail the projects and initiatives that result from the actions during the Dublin City Biodiversity Action Plan 2015-2020. In total, there were 35 specific Conservation, Research and Management projects and 28 Education and Outreach initiatives, along with outreach through press, radio, and social media, as well as partnering with other local authorities, the Dublin Bay UNESCO Biosphere Reserve Partnership, the Dublin Mountains Partnership, regional offices, agencies, and third level educational institutes.

Table 1. Conservation, Research and Management projects from the Dublin City Biodiversity Action Plan 2015-2020

| No. | Description |
|-----|--|
| 1 | A pesticide reduction strategy implemented, resulting in the elimination of glyphosate from parks management and DCC roads, 2018-2020 |
| 2 | Field work completed for a 4-year satellite tagging study of how Light-bellied Brent Geese use Dublin Bay, as part of the DBBP with Exeter University. Final report due in 2021. |
| 3 | Annual surveys for Marsh Fritillary Butterfly on North Bull Island were completed with NBDC |
| 4 | An Assessment of the effects of Kitesurfing and other activities on the water birds using Dollymount Strand was completed and informed the updated NBI management plan |
| 5 | An assessment of the effects of recreational and other activities on the water birds using the Bull Island saltmarsh completed and informed the updated NBI management plan |
| 6 | An extensive 3-year survey of the Flora and Vegetation of North Bull Island was completed in 2020. In total, 316 plant species were recorded, including 46 floristically significant plant taxa, 5 legally protected species, and 4 classified as 'Near Threatened' on Ireland's Red List of vascular plants. There were also 2 newly recorded species for Ireland's east coast. |
| 7 | A study on managing the impact of dogs and dog walkers on biodiversity at North Bull Island was completed in 2017 and informed the updated NBI management plan |
| 8 | North Bull Island Dog Tracking Project, completed with the Herpetological Society of Ireland in 2018 and informed NBI management plan |
| 9 | Hare survey on North Bull Island completed in 2016 |
| 10 | North Bull Island Management Plan was updated, 2019-2020 |
| 11 | North Bull Island Nature Reserve was rebranded, 2018-2021 |
| 12 | Orchid surveys of North Bull Island, Irishtown Nature Park & St. Anne's Park were completed in 2015 |
| 13 | Special Conservation Interests of SPAs were Monitored by Birdwatch Ireland as part of the Irish Wetland Birds Survey |
| 14 | Pilot Study on the Disturbance of Grey and Harbour Seals on North Bull Island was completed with Irish Whale and Dolphin Group, 2018 |
| 15 | Ground-Nesting Bird surveys were conducted with BirdWatch Ireland on North Bull Island in 2020, which was supported by the DHLGH through the NBAP fund |

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| 16 | Assessment of the abundance, distribution, and breeding status of riparian birds along the River Dodder was completed as part of the Dublin City Urban Birds project, 2015 |
| 17 | A Dublin City pilot wetland projects was initiated in Bushy and Belcamp Parks with the Herpetological Society of Ireland with funding from the DHLGH through the NBAP funds |
| 18 | A seal census of Dublin Bay was completed with the Irish Seal Sanctuary in 2018 |
| 19 | The Dublin City Habitat map was updated in 2020 with funding from the DHLGH through the NBAP funds |
| 20 | The first comprehensive survey of otter in Dublin's rivers was completed in 2020, which revealed otter in 11 of Dublin's rivers |
| 21 | The Dublin City Tree Mapping Project was completed in conjunction with UCD in 2020. The project recorded the canopy cover and launched a new recording and information App for Dublin called Curio |
| 22 | The Dublin City Urban Woodland and Hedgerow Survey was updated in 2020 |
| 23 | A study of the <i>Ectocarpus</i> and its drivers was initiated with NUI Galway in 2019 |
| 24 | A study of the Eelgrass (<i>Zostera</i>) beds at Sandymount was completed with Coastwatch Ireland, 2019 |
| 25 | Flora & Vegetation Surveys of 50 of Dublin's City Parks were completed over the period 2017-2019 |
| 26 | Green infrastructure projects on the rivers Dodder and Mayne were initiated |
| 27 | Hedgehog, pygmy shrew, and badger surveys were conducted in 10 city parks in 2020 |
| 28 | Herpetological surveys of Dublin City parks were conducted with the Herpetological Society of Ireland, 2015 & 2019 |
| 29 | RAMSAR Wetland Contribution |
| 30 | A management plan for South Dublin Bay Management Plan was initiated in 2020 |
| 31 | Surveys along the Canals were conducted in partnership with Waterways Ireland |
| 32 | A Trout population genetic study for Dublin Rivers was completed in conjunction with Inland Fisheries Ireland and Queens University Belfast in 2015 |
| 33 | Wildfowl Monitoring was conducted in 2019-2020 and a review of the Wildfowl Monitoring Programme was also supported from 2007-2020 |
| 34 | Surveys of wintering and breeding birds were completed in conjunction with BirdWatch Ireland from 2019-2020 as part of Santry River Regeneration project, with |
| 35 | Bat survey was conducted in Brickfields Park in Drimnagh in 2020 |

Table 2. Education, Outreach and Citizen Science initiatives from the Dublin City Biodiversity Action Plan 2015-2020

| | |
|----|---|
| 1 | DCC Hosted the EuroMAB conference in April 2019, which brought together delegates from biosphere reserves across Europe and North America to share experience and collaborate. |
| 2 | A ' <i>Short Guide to Three Dublin City Woodlands</i> ' educational guide to the woodlands of Bushy Park, St. Anne's Park and Tolka Valley Park was produced in 2020 |
| 3 | <i>An Urgent Enquiry</i> arts project was completed in conjunction with the City Arts Office, resulting in an App on the history and natural heritage of North Bull Island |
| 4 | Annual biodiversity seminars were conducted with Environmental NGOs and Third level educational institutes |
| 5 | Large-scale biodiversity outreach events were hosted each year at Battle for the Bay and the St. Anne's Rose Festival |
| 6 | The Brent Goose Ambassador Schools Programme engaged with school students, facilitating workshops and trips to Bull Island, with the programme garnering press, radio and TV publicity. |
| 7 | Support was given to Daubenton Bat Surveys were supported with Bat Conservation Ireland and the Dublin Bat Group |
| 8 | A range of interpretation material was developed and published with funding from the DHHG through the NBAP funding scheme |
| 9 | A Dodder Networking Summit was hosted with environmental groups and NGOs |
| 10 | Education, training and support for students and teachers through the National Discover Primary Science Centre at North Bull Island, which has facilitated numerous research projects, including genetic populations of lizards; urban fox populations in south Dublin; ecosystem service mapping for Dublin. |
| 11 | The North Bull Island conservation volunteer programme was established. In 2019, a core group of 18 volunteers complete 976 hours of volunteering time, including conducting a range of workshops with a reach of over 400 people. |
| 12 | <i>Explore the Shore</i> launch was hosted on North Bull Island and beach surveys were held |
| 13 | Heritage in Schools Training Days were hosted |
| 14 | Invasive Species Training was provided to DCC Parks staff |
| 15 | Marine surveys were conducted with Coastwatch and members of the public |
| 16 | Various National Biodiversity Data Centre workshops were supported |
| 17 | Events were held each year for National Heritage Week, including trips to North Bull Island, bat and river walks, and wildlife found in cemeteries |
| 18 | Nature First Saturdays & Wildlife Wednesdays workshops were held for members of the public to engage with nature |
| 19 | The Nature in the <i>Park</i> schools' resource was produced with ECO-UNESCO and launched with the Lord Mayor in 2019. |
| 20 | Citizen science surveys for otters were conducted with the Irish Wildlife Trust, which included training workshops |
| 21 | DCC supported various Biodiversity Awareness Programmes with OWLS education |

| | |
|----|--|
| 22 | The promotion of the Dublin Bay UNESCO Biosphere Reserve was conducted at various events and workshops |
| 23 | Promotion of biodiversity themes and events took place for key national events, including UN International Biodiversity Day and National Biodiversity Week, World Wetlands Day, National Heritage Week, National Tree Week, National Dawn Chorus, National Coastwatch Survey, Bealtaine and National Science Week. |
| 24 | RTÉ Dawn Chorus events were hosted and publicised with RTÉ |
| 25 | Student placements and support for student research projects were facilitated |
| 26 | Training webinars were hosted for teachers on using resources and teaching about biodiversity |
| 27 | Volunteering activities with Conservation Volunteers Ireland |
| 28 | World Wetlands Day exhibitions took place in DCC Civic Offices and talks on biodiversity were also hosted for DCC staff |

Table 3. Partnering and collaboration from the Dublin City Biodiversity Action Plan 2015-2020

| | |
|---|---|
| 1 | Key partner in the Dublin Bay UNESCO Biosphere Partnership, working to promote the conservation, research, and education of the Biosphere |
| 2 | Worked in partnership with Fingal, Dun Laoghaire Rathdown and South Dublin County Councils on cross border biodiversity initiatives |
| 3 | Partner in the Dublin Mountains Partnership (DMP), contributing to the DMP strategic plan, Dublin Mountains Makeover project, and management of the mountains area |
| 4 | Collaboration with agencies, including National Parks and Wildlife Service, Heritage Council, Waterways Ireland, Irish Rail, National Biodiversity Data Centre |
| 5 | Partner with Third level educational institutes to conduct biodiversity research, including TCD, UCD, NUI Galway, DCU and Queen's University Belfast |
| 6 | Collaboration with other Dublin City Council and departments, including the Water Framework Office on Green Infrastructure, Climate Action Office, Climate Action Regional Office, and City Arts Office |

APPENDIX 2

Table 4: Stakeholders Consulted During the Preparation of the Dublin City Biodiversity Action Plan 2021-2025

| Member name or organisation | Abbreviation |
|--|---------------------|
| An Taisce – Clean Coasts and Dublin Branch | AT |
| Birdwatch Ireland | BWI |
| Coastwatch | CWI |
| Dublin Bat Group | DBG |
| Dublin Bay Biosphere Reserve Partnership | DBBRP |
| Dublin City University | DCU |
| Dublin Naturalists' Field Club | DNFC |
| Dublin Port Company | DPC |
| ECO-UNESCO | ECO |
| Heritage Council | HC |
| Herpetological Society of Ireland | HSI |
| House Martin Conservation UK and Ireland | HMC-UKIE |
| Irish Brent Goose Research Group | IBGRG |
| Irish Midland Ringing Group | IMRG |
| Irish Rail | IR |
| Irish Seal Sanctuary | ISS |
| Irish Whale and Dolphin Group | IWDG |
| Irish Wildlife Trust | IWT |
| Leave No Trace | LNT |
| Local Authority Waters Programme | LAWPRO |
| National Biodiversity Data Centre | NBDC |
| National Botanic Gardens | NBG |
| National Parks and Wildlife Service | NPWS |
| National University Ireland Galway | NUIG |
| Swift Conservation Ireland | SCI |
| TCD | TCD |
| TU Dublin | TUD |
| University College Dublin | UCD |
| University of Exeter | UoE |
| Waterways Ireland | WWI |

APPENDIX 3

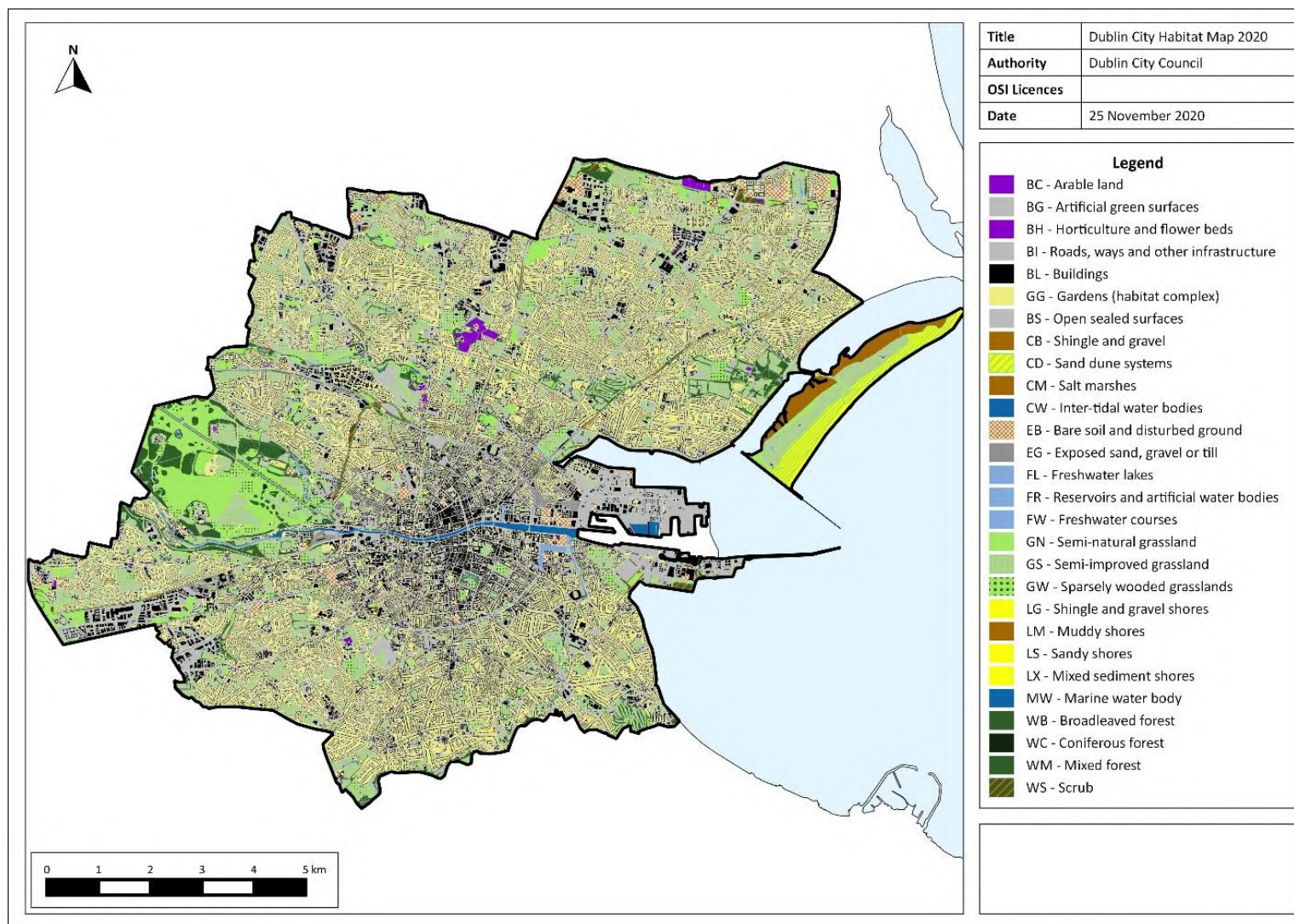
Table 5: Abbreviation list for Agencies and Partners

| Member name or organisation | Abbreviation |
|--|--------------|
| An Taisce | AT |
| Angling Associations | ANG |
| Bat Conservation Ireland | BCI |
| Birdwatch Ireland | BWI |
| Bull Island Action Group | BIAG |
| Climate Action Regional Office | CARO |
| Coastwatch | CWI |
| Conservation Volunteers Ireland | CVI |
| Cork Nature Network | CNaN |
| Department of Housing, Local Government and Heritage | DHLGH |
| Dodder Action Group | DAG |
| Dublin Bat Group | DBG |
| Dublin Bay Biosphere Reserve Partnership | DBBRP |
| Dublin City Council | DCC |
| Dublin City University | DCU |
| Dublin Naturalists' Field Club | DNFC |
| Dublin Port Company | DPC |
| ECO-UNESCO | ECO |
| Geological Survey of Ireland | GSI |
| Heritage Council | HC |
| Herpetological Society of Ireland | HSI |
| House Martin Conservation UK and Ireland | HMC-UKIE |
| Inland Fisheries Ireland | IFI |
| Irish Brent Goose Research Group | IBGRG |
| Irish Midland Ringing Group | IMRG |
| Irish Rail | IR |
| Irish Seal Sanctuary | ISS |
| Irish Water | IW |
| Irish Whale and Dolphin Group | IWDG |
| Irish Wildlife Trust | IWT |
| Leave No Trace | LNT |
| Local Authority Waters Programme | LAWPRO |
| National Biodiversity Data Centre | NBDC |
| National Botanic Gardens | NBG |
| National Parks and Wildlife Service | NPWS |
| National University Ireland Galway | NUIG |
| Non-Governmental Organisations | NGO |
| North Bull Island Volunteers | NBIV |
| Office of Public Works | OPW |

| | |
|------------------------------------|-------------|
| Other Local Authorities | LAs |
| Seal Rescue Ireland | SRI |
| Swift Conservation Ireland | SCI |
| TCD | TCD |
| Third Level Educational Institutes | Third level |
| TU Dublin | TUD |
| University College Dublin | UCD |
| University of Exeter | UoE |
| Waterways Ireland | WWI |

APPENDIX 4

Dublin City Habitat Map (2020)



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