# Dublin City Biodiversity Action Plan 2008 – 2012

***An Action of the***

***Dublin City Heritage Plan 2002 – 2006***

***and an Objective of the***

***Dublin City Development Plan 2005 – 2011***

Biodiversity

An Chomhairle Oidhreachta
The Heritage Council

Dublin City
Baile Átha Cliath

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**Funding partners**

Dublin City Council wishes to acknowledge the role of the Heritage Council in initiating the Dublin City Biodiversity Action Plan in association with Dublin City Council. In particular, Dublin City Council acknowledges the support of the Heritage Council through its joint funding of the Biodiversity Officer post, and the provision of  37,500 for the implementation of the Biodiversity Action Plan in 2007.

Publication compiled and edited by Dublin City Biodiversity Officer, Mairéad Stack and Siobhán Egan (ex-Biodiversity Officer), Donncha Ó Dúlaing, Dublin City Heritage Officer and steering group members.

Publication designed and produced by Environmental Publications.

For more information contact biodiversity@dublincity.ie or visit Biodiversity on the Dublin City Council website at www.dublincity.ie. This document is available in Irish.



*Right: Brent Geese feeding on Sandymount sand and mud flats. (Photo: Anthony Woods)*
*Page 4: Overview of Dublin City. (Photo: Dublin City Parks Department)*

# Table of Contents



Dublin City
Baile Átha Cliath

An Chomhairle Oidhreachta
The Heritage Council

Biodiversity

*The Biodiversity Action Plan 2008-2012 is an action of the Dublin City Heritage Plan 2002 – 2006 and is an objective of the Dublin City Development Plan 2005 – 2011*

# 1. Lord Mayor's address

Dublin City Council's Biodiversity Action Plan reflects a new era for the City of Dublin and presents challenges for management. There is a change in ethos across the globe in terms of respecting our environment and understanding its importance to mankind's health and survival. Climate Change, Carbon footprints and Recycling; are all terms that are part of our everyday language and life. Biodiversity needs to be added to this list of common terms and the publication of Biodiversity Action Plans like this one is a significant step forwards.

The Biodiversity Action Plan identifies the amazing wealth of wildlife and nature that exists in Dublin city. Many birds migrate to the city annually and we have a significant amount of rare plants. We can be proud that Dublin Bay is recognised internationally for its protected habitats and birds. The fact that we have managed to hold onto some of our natural heritage while developing at a fast rate is extraordinary. We cannot be complacent however and we must really focus on holding onto the natural resource that exists before it's too late. We cannot continue with the idea that we can replace what is lost during development. The biodiversity we experience now is the result of 3.5 billion years of evolution so it is evident that it cannot be replaced easily.

We need to grasp the ethos that nature is not just a project for schoolchildren. It is an essential component of our lives and provides us with and regulates food, fuel, fibre, medicines, clean water and air. All of which are necessary for our health and survival. Nature is also a force that must be taken seriously, e.g., rising sea levels and flooding rivers.

This Plan identifies the link between preserving Biodiversity and mitigating against the negative effects of Climate Change and increased rainfall. Trees, hedges, green spaces and wetlands are essential tools to deal with increased rainfall, higher temperatures and inclement conditions. These habitats also provide essential shelter and food to the tiny animals that we can't even see but that are part of the food chain of those animals we hold up as charismatic inhabitants of our city such as the fox or the peregrine falcon. We must understand that we cannot simply remove or develop on these habitats without repercussions.

I welcome the actions of this Plan that include both local community and business participation. Engaging local groups and sectors will act as a catalyst throughout the city to identify local wildlife areas that are at risk of being lost in a tide of development and provide a means of protecting these areas. Local communities and businesses must be supported in conserving a vital network of small wild areas that will create a corridor for wildlife across the city. This Biodiversity Action Plan will lay the foundations on which these corridors can be identified, protected and enhanced.

I commend the work of all those who participated in the process of producing this excellent publication. The extent of consultation is clearly evident in the large resource of natural heritage information contained within the document. It is also evident from the practical actions identified in the Plan relevant to preserving our natural resources. I look forward to seeing the fruits of its implementation.

**Cllr. Paddy Bourke, PC**
**Lord Mayor of Dublin**

*Flock of Oystercatchers flying over Dublin Bay. (Photo: Anthony Woods)*

# 2. City Manager's address

Biodiversity is a key part of the character of Dublin city and its people and I am delighted to see the production of the City's first Biodiversity Action Plan. We are one of the first local authorities to put together and implement such a plan.

The City Council, in partnership with the Heritage Council, is one of the few councils in the country to have appointed a Biodiversity Officer. This role has been supported through the Dublin City Heritage Plan 2002 – 2006, and has been key to gathering stakeholders to produce the plan.

The Biodiversity Action Plan will help us to achieve many of the objectives of the Dublin City Development Plan relating to quality of life, greenspace and amenity provision, planning development, and the protection of natural heritage in the city. It will also help us shape policies and objectives for future development plans.

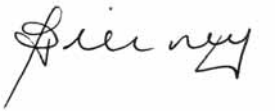
The Biodiversity Action Plan provides us with an opportunity to increase our knowledge base; to raise understanding and appreciation; to plan and develop with biodiversity in mind; and to identify opportunities to protect, enhance and restore what is of ecological value in the city. It will help to integrate biodiversity into the Council's day-to-day operations, and into innovative projects.

The Plan identifies ways in which everyone can make a difference and become more actively involved with their natural heritage. Halting the loss of biodiversity is a significant challenge for all of us and requires urgent and informed action. It is important to build on the existing work of the Council and that of other stakeholders involved with Dublin's wildlife.

Working with individuals, communities, other local authorities, non-government organisations, the construction industry, businesses and government agencies is key to implementing the plan and ensuring it is delivered effectively. By pooling our experience and resources we are more likely to have a greater impact. We will build on existing partnerships through the plan and create new ones.

By working together, our responsibilities for biodiversity will be delivered more easily. I commend the time and thought put into the plan by the individuals and groups who have contributed to its content including the steering group members and the many consultation responses received.

I wish the plan every success and assure continued support for its implementation.

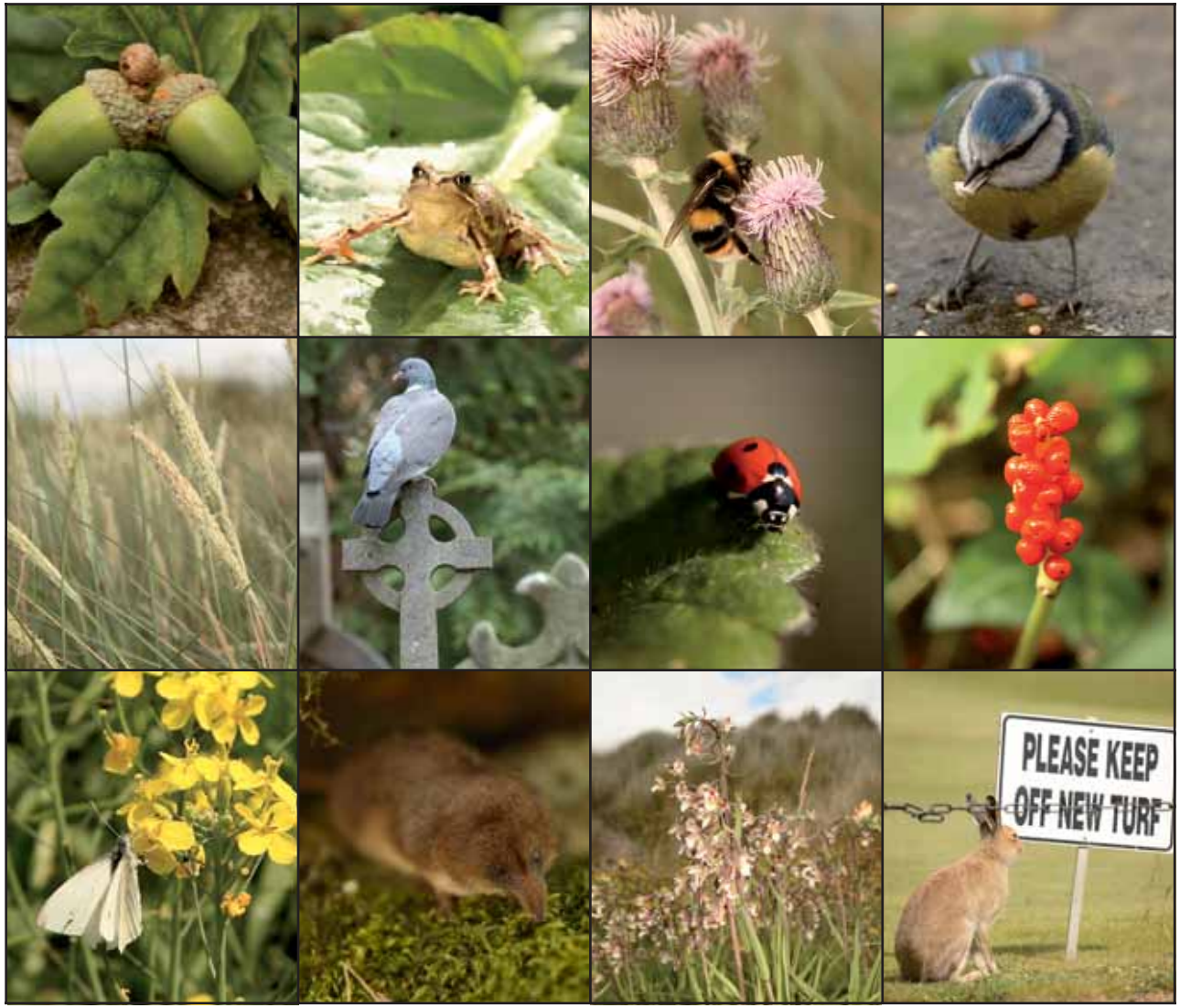


**Dublin City Manager**

# Priority species, habitats and natural heritage features identified in the Biodiversity Action Plan

A number of species, habitats and natural heritage features have been selected for priority conservation measures within the city. These are:

- **Bats**
- **Otters**
- **Red Squirrels**
- **Birds**
- **Salmonids, e.g., salmon and trout species**
- **Selected invertebrate groups**
- **Hedgerows and Urban Trees**
- **Protected rare, scarce or threatened plants**
- **Semi-natural grasslands**
- **Wetlands**



# 3. Introduction – Biodiversity: the variety of life

## What is biodiversity?

Biodiversity (short for biological diversity) means the variety of life, the wide range of living things in the world, everything from the smallest insect to the largest whale. It includes our rare plants and animals as well as common species including those that indicate the richness of our local environment (such a breeding birds in local parks or in gardens). It includes the huge range of genetic varieties within all plants and all animals.

Biodiversity is more than a list of plants and animals that occur in a certain area, as it takes into account the interactions and interdependency that plants and animals have on each other and on their locality. It also includes natural processes that are needed to establish or develop populations of plants and animals (such as windblown sand for sand dune development). Animal species and plant species may also depend on aspects of the built environment; examples include bats that roost in bridges and buildings, or peregrine falcons that may nest on high buildings. Biodiversity includes our geological legacy that has shaped the current landscape and its flora and fauna.

The urban setting has a significant role in protecting and enhancing natural environments and for enthusing people about wildlife, which is an important part of Dublin city's character and culture.

## Why is biodiversity important?

The conservation of Biodiversity is intrinsic to our well-being. The biodiversity we experience now is the result of 3.5 billion years of evolution and is fundamental to human survival. Much development over recent decades has enriched our lives but has been associated with the decline in the variety and extent of natural systems. This loss of biodiversity at the ecosystem, species and gene level is an issue of serious concern not only because of the ethical issues raised but also due to the decline in ecosystem services which natural systems provide. These services include production of food, fuel, fibre, medicines, regulation of water, air, climate, maintenance of soil fertility, cycling and nutrients. Biodiversity can help reverse the negative impacts of climate change. Good coastal wetlands can improve protection against rising sea levels and healthy floodplain and other wetland ecosystems can limit the effects of river flooding. Forests and peatlands are carbon sinks and plants and animals are used as indicators of climate change.

For many people our urban centres do not appear to be the best places to find wildlife. Many species are elusive and avoid close contact with people or are nocturnal so we don't see them. Many have successfully adapted to urban conditions, such as the fox. The city also still supports refuge areas for wildlife, e.g., brownfield sites, parks, gardens and canals.

### CULTURAL CONNECTIONS

People don't always associate wildlife as being part of their culture especially in an urban context.

Molly Malone cried 'Cockles and Mussels Alive Aliveo' through the streets of Dublin. These were Dublin Bay cockles and mussels that lived in the Bay, feeding on nutrients in the mud. They are still the food supply of many of the wild birds of international importance that use the bay as a stop off point on migration routes or as their winter retreat. The statue of Molly Malone is possibly the most photographed in the city and the song can be heard at international sporting events and in Irish pubs across the globe. Yet we know little about how the populations of cockles and mussels have changed over the years, and many of Dublin's own citizens don't know what a cockle looks like!

*(Photo: Barkley Doyle)*

## WETLAND AT TOLKA VALLEY PARK

*John Collins, Dublin City Council Engineering*

**Clean water and amenity**

The Finglaswood stream is a small stream that originates in Finglas. Just before it outfalls to the river Tolka the stream feeds into a pond in Tolka Valley Park. The stream and pond were heavily polluted by domestic misconnections and intermittent road run-off (as well as rainfall there was the washing of private cars and the disposal of used engine oil into gullies) so the amenity value of the pond was lost. There were large algal growths, grease, milky scum, vegetable matter and hydrocarbons visible in the water.

Pollution Control and Parks in DCC decided that installing a wetland upstream of the pond would help treat the stream (by settlement of suspended solids, uptake of nitrogen and phosphorus, removal of hydrocarbons and faecal coliforms). This would also comply with the Water Framework Directive, the Phosphorus Regulations and the Nitrates Directive.

The design aimed to provide a wetland to contain and treat flow in emergent vegetated areas, blend in with its surroundings and enhance habitat diversity. These are the three objectives of an Integrated Constructed Wetland. Other considerations included managing littering, vandalism and health and safety.

As a result of the constructed wetland, the water quality in the pond has improved significantly, and it now supports a large bird population (mallards, water hens, coots and swans – even a kingfisher) insect life (dragon flies) and diverse plant communities. The capital cost of such a project is insignificant compared to hard engineering solutions and after construction there has been almost no maintenance requirements. There are no pumps associated with it as the feed is by gravity and it operates all day, every day for free. DCC is actively engaged in a programme of wetland construction, e.g., Cardiffsbridge Park in Finglas.

*Tolka Valley Park integrated constructed wetland. (Photo: John Colllins)*

The establishment and development of cities near estuaries and along rivers means their location and development can be particularly significant for natural heritage. Dublin city's natural heritage is characterised by the city's geographical location, its proximity to the sea, access to waterways and the incorporation of significant greenspace.

Development patterns, traditional land uses, population changes and many other factors dictate the type of city spread which can also dictate the natural heritage resource still remaining. Dublin's geographical and topographical features have also shaped the city. Wildlife, the city and its people have always been interacting and continue to interact and respond to each other.

The development of the city is proceeding at an accelerating rate and it is necessary to improve the management of nature to protect our natural heritage, habitats, plants and wildlife. Biodiversity can also provide other environmental services such as pollution control, flood attenuation and erosion prevention. The development of the city presents an opportunity to plan for and enhance this aspect of Dublin's heritage. This challenge provides an opportunity for Dublin City Council, developers, residents and specialists to work together. The city's Local Biodiversity Action Plan provides an opportunity for learning about the processes that determine the quality of urban

biodiversity and the means to incorporate more wildlife friendly elements into existing environments and into the process of urban planning. It is widely acknowledged that acting locally can have significant results on a local, national and even global level.

## Local, national and international actions for biodiversity

Traditionally the management of biodiversity has been the principal responsibility of the National Parks and Wildlife Service within the Department of the Environment, Heritage and Local Government. Its main focus is the protection of rare sites and species, many of which are also important internationally, under the EU Birds Directive and EU Habitats Directive, and Conventions such as Bonn, Bern, Ramsar and CITES. Under the Planning and Development Regulations 2001 (S.I. 600 of 2001) made under the Planning and Development Act, 2000, all planning authorities must identify such sites – Special Areas of Conservation (SACs) under the Habitats Directive and Special Protection Areas (SPAs) under the Birds Directive – in their development plans. The Habitats Directive also emphasises the need for "land use planning and development policies to encourage the management of features of the landscape which are of major importance to flora and fauna" and features of the landscape which support the network of SACs and SPAs such as rivers, hedgerows, ponds and small woods.

The National Biodiversity Plan (2002), the objective of which is "to secure the conservation, including where possible enhancement and sustainable use of biodiversity in Ireland and to contribute to conservation and sustainable use of biodiversity globally", states that is essential that action is taken at local level.
The National Heritage Plan (2002) refers to local authority plans and programmes and the need to promote local responsibility for biodiversity management.

*St. Audoen's Church in the centre of Dublin. (Photo: A. Woods)*

### MAJOR THREATS

Three of the major threats to global biodiversity are detailed below and all are relevant to natural heritage in the city. They have been identified as:

**LOSS OF EXTENT** – Removing an area of habitat, for example, rainforest or a section of woodland, garden or park, results in a direct loss. Replacing with equally valuable habitat isn't always possible. Buildings and bridges provide habitats for bats in particular, their removal or replacement can also have a direct impact on the city's bat populations.

**HABITAT FRAGMENTATION** – Breaking up large areas into isolated smaller parts reduces the ability of animals to move away from a threat and reduces food and cover. Plants and animals that can't mix with others of their kind soon die out as physical links for commuting to other populations no longer exist. We need to unblock routes for wildlife on all scales - allowing riverbank vegetation to be continuous, and linking the Bay with parks in the inner city and the inner city with the Dublin hills is important. Retaining and creating scrub or hedge cover to connect wooded pockets in parks or between gardens is crucial.

**INVASIVE SPECIES** – Plants and animals that arrive from elsewhere and quickly take over spaces that are usually occupied by native species pose a huge threat. Not only do we lose native species, but some plant species are so prolific that uniform stands of the invasive plants will exist and spread – reducing use of the area by other species. Our waterways are particularly vulnerable.

## CLIMATE CHANGE – COPING WITH THE CHALLENGES AND REDUCING DUBLIN'S IMPACT

All cities should be trying to reduce their carbon emissions as it is clear humans are having dramatic effect on climate around the globe. Dublin city's carbon footprint is likely to be significant in a national context, being an urban centre. However, a number of measures can be taken to reduce its impact, including: reducing car usage; using alternative fuels; the use of more efficient waste management measures by all sectors; and implementing energy conservation measures in domestic homes.

– Biodiversity acts as an indicator for climate change and mitigates against negative impacts. Vegetation absorbs Carbon Dioxide ($CO_2$), so enhancing and creating greenspace with appropriate planting can help.

The city will need to cope with changes due to climate change including more extreme weather.

– Sudden and heavy rainfall can be dealt with better if attenuation areas exist. Increasing use of soft landscaping in the city and promoting 'green roofs' will reduce run-off and help to avoid flooding. Wetlands in open spaces hold water for longer, helping to prevent flooding elsewhere.
– Cities with a high proportion of concrete are likely to overheat. Planting to develop greenspaces and create mature shade to cool the city in the future is crucial.
– Rising sea levels combined with weather extremes are serious concerns for all coastal cities. Soft areas of coast (such as Bull Island) can provide a buffer to weather extremes. Retaining greenspace to absorb water, creating wetlands in coastal areas, allowing the natural build-up of sand dunes and minimising development along the coast are all actions of the draft DCC Climate Change Strategy.

*Aerial view of Sandymount Strand. (Photo: Anthony Woods)*

The preparation of Biodiversity Action Plans by local authorities is also supported by Agenda 21 and the Convention on Biodiversity (during the 1992 Rio Earth Summit), which have both been endorsed by the Irish government. The Irish National Plan for Sustainable Development (1987) refers to the potential of land-use planning and the value of urban open spaces for ecology and maintaining environmental quality. It states that local authorities should lead by example through integrating sustainability into policies and functions, and facilitating action in the community. Agenda 21 and the Convention on Biodiversity promote the preparation of local plans and sectoral plans as a means of raising the standards of environmental management including the management of biodiversity. They highlight the responsibility of all citizens and sectors. They emphasise the importance of accurate and accessible information, the need for policies to be relevant to local cultures and economic realities and the value of measuring progress towards sustainability by the development of indicators. The world target for progress is "the achievement by 2010 of a significant reduction in the current loss of biological diversity". In 2008 the 9th Meeting of the COP (Conference of Parties) of the Convention of Biodiversity will consider urban biodiversity.

*Above: Garden spider in Botanic Gardens. Below: Adult mute swan and signets in Bushy Park. (Photos: Anthony Woods)*

## Why a Plan?

The world target for progress is "the achievement by 2010 of a significant reduction in the current loss of biological diversity"

In order to achieve any target, especially one as ambitious as halting the loss of biodiversity, it is necessary to engage a number of people from wide-ranging sectors. While everyone has a role to play, a coordinated effort, pooling resources and focusing collective energies is a more effective way to achieve such a task. A plan can give guidance, provide clarity and support for people's aims as well as help prevent unnecessary repetition.

### THE COUNTDOWN 2010 INITIATIVE

More than one decade after the implementation of the Convention on Biological Diversity, the recognition of biodiversity loss has gained high political profile both at global and national level. This has resulted in commitments for action by heads of states such as the Gothenburg European Council, at the stakeholder's conference in Malahide in 2003 and in the EU 2006 Biodiversity Communication to 'achieve a significant reduction of the current rate of biodiversity loss'. At a Pan-European level, the Countdown 2010 initiative was endorsed in May 2003 by the 5th Environment for Europe Ministerial Conference in Kiev. Countdown 2010 is an independent initiative and aims to:

1. Encourage and support the full implementation of all the existing binding international commitments and necessary actions to save biodiversity.
2. Demonstrate clearly what progress Europe makes in meeting the 2010 Biodiversity Commitment.
3. Gain maximum public attention across Europe for the challenge of saving biodiversity by 2010.

**www.countdown2010.net**

**Notice Nature** is a national initiative, run by the National Parks and Wildlife Service to raise awareness of biodiversity issues across all sectors. This is an action of the National Biodiversity Plan 2002.

**www.noticenature.ie**

**The National Biodiversity Data Centre (NBDC)** is a national initiative launched by the National Parks and Wildlife Service in 2007. It is based in Waterford and is an action of the National Biodiversity Plan 2002.

*Red squirrel in St. Anne's Park, Raheny. (Photo: Anthony Woods)*

Local people and organisations are needed to successfully deliver actions for biodiversity in Dublin city. A steering group with representatives from a spectrum of interests has guided the collation of information and ideas presented in the Action Plan. As well as this, a large number of comments was received from the public and a wide range of organisations, both in written and discussion form, during the course of two consultations on the production of this plan. All these comments have been used to help shape this document. The involvement of the public does not end with the publication of this Action Plan – the basic concept of sustainability is that everyone has a responsibility to maintain the environment for present and future generations – this is only the beginning and everyone is in a position to make a difference.

## How to make best use of this plan

The Dublin City Biodiversity Action Plan is intended to be a working document. It includes a summary of the range of priority habitats and species of international, national and local importance in the city. The main content of the plan is a programme of actions recommended to protect and enhance the city's natural heritage. The Plan has selected a number of habitats and species for priority action. These are on pages 25-40. Actions are displayed as two sets of tables:

- Strategic directions (pages 15-23)
- Natural heritage interests (pages 25-40)

The plan should be used to obtain ideas on how to enhance biodiversity. It should assist in identifying ways in which people can actively engage with natural heritage and to identify potential project partners. It should assist with justifying funding for projects, as proposals linked to the plan would also be contributing to a wider and collaborative goal. A number of resources, contacts and existing projects are also detailed through the plan.

## How you can make a difference

**YOUR GARDEN**

The Dublin City Habitat Mapping Project has identified that approximately 25% of the city area is made up of private gardens. This is a considerable green space resource which adds hugely to the natural heritage value of the city by providing cover, feeding and commuting routes for wildlife including hedgehogs, bats, badgers and birds. Insects are the food supply for many birds and mammals and enhance pollination and aphid control. Wildlife-friendly techniques in individual gardens can make a huge contribution to the city's biodiversity. Even the most urban looking garden can enhance natural heritage. Berry-bearing and flowering plants are key. Nettles are vital food/shelter for many species of butterfly caterpillars. Leave a log pile in the corner of the garden to provide a safe hibernation location and leave some areas of grass uncut. Where there's space, one crucial way to boost biodiversity is through provision of ponds (without tadpole-eating goldfish) with gently sloping edges and some emergent vegetation. Frogs, water

beetles, pond snails and sometimes dragonflies and damselflies will use ponds. Ponds provide excellent bathing and drinking places for birds and erecting bird boxes in your garden provides shelter to nesting birds. Feeding birds in your garden provides a fascinating view into the world of wildlife. Another way of easily enhancing biodiversity is by eliminating the use of harmful pesticides and herbicides from your garden. This protects insects and plants which form part of the lower elements of the food chain. Putting up a bat box high up near the eaves of your house can entice bats into your garden and they in turn eat the biting insects which you may not want in your garden.

**YOUR COMMUNITY**

Be active in your community and encourage others in your street or area to used wildlife-friendly measures. This will help create a 'hot spot' for biodiversity. A line of gardens may create a corridor of wildlife that can link to a local park or greenspace. Some communities may want to create a Community Wildlife Plan, working with local schools and other greenspaces in the locality to boost biodiversity. Entering into the Wildlife category of the Tidy Towns competition and helping others such as local businesses to help enhance their greenspaces in the community is also beneficial.

**AT WORK AND AT PLAY**

Where you work or spend leisure time can also enhance biodiversity and provide crucial habitats for animals and plants. Encouraging local schools, parks, golf courses and businesses to retain parts of their grounds that are important for wildlife and use their open space to benefit local biodiversity and contribute to the biodiversity of the city is important. Appropriate open-space design and management (no matter how small) can provide environmental education and help business address corporate responsibilities and provide community benefits.

Becoming more actively involved in local voluntary action groups and field clubs, or through membership of organisations with professional interests in biodiversity is also an effective way of helping to make a difference. Become involved in national and local surveys for species such as garden birds and bats. Support and training for taking part is often provided. Many organisations hold open days or events in local areas informing people about their biodiversity. Events, open days and national initiatives such as Biodiversity Week (May) and Heritage Week (August/September), Tree Week (March) and Tree Day (October) need to be supported, encouraged and developed further to provide more opportunities to become more involved.

For ideas and links on how to get more involved, check out the Biodiversity section of the Dublin City Council website www.dublin.ie or ENFO at www.enfo.ie.

Sharing information, experience and teaming up to achieve common goals are key to making a difference. This plan should be used to determine priorities for projects in the city and help others to contribute; to build up information; to develop examples of best practice; and to initiate policy to help protect and enhance Dublin's natural heritage.

## DOGS, BIRDS AND DUBLIN BAY

Dogs running off their leads can disturb wildlife at certain times of the year more than others – in particular, nesting birds in early spring and early summer and roosting or feeding birds in winter. Waders and wildfowl feeding on eelgrass on mudflats and on seaweed and insects along the shore edges in Dublin Bay are particularly vulnerable. North Bull Island is a Nature Reserve so dogs must be kept on leads here. On average, 33 different waterbird species regularly occur in Dublin Bay, and frequently the bay supports in excess of 20,000 waterbirds over winter months – including approximately 6,000 wildfowl, 24,000 waders and 6,000 gulls annually. The bay supports up to 12,000 roosting terns from late Jul-early Sept. 42,000 Black-headed gulls were recorded on one occasion in 2007. Internationally important concentrations of Light-bellied Brent goose, Black-tailed godwit, Bar-tailed godwit and Redshank occur here. It is one of the top three sites in Ireland for Light-bellied Brent goose, Pintail, Grey plover, Knot, Sanderling and Bar-tailed godwit. These birds use the bay and green space as feeding grounds, having travelled from Arctic Eastern Canada (Brent geese) and Arctic regions of Russia and Scandinavia (Bar-tailed godwits). Very large flocks of post-breeding Terns congregate in the bay before their long journey.

# 3. Dublin city's natural heritage: visions, issues and actions for biodiversity

## Wildlife in the city

The city has legal responsibilities to recognise and protect aspects of natural heritage and has identified a number of objectives of the Dublin City Development Plan which relate to this.

Much of Dublin city holds significant natural heritage both in its built areas including buildings (old and new) railway sidings and brownfeld sites and in areas considered more typical for wildlife such as its greenspace, its waterways and coastal areas.

The designated sites of North Bull Island and North and South Dublin Bay constitute part of the Irish and European network of protected areas for biodiversity as the Bay supports habitats and wildbird populations of international importance. Our waterways including the Liffey, Tolka and Dodder support a significant wildlife resource including otters, bats, Atlantic Salmon, Brown Trout, Sea Trout, Kingfisher (many of European importance and for which we are required to provide strict protection). All of these waterways and their associated riparian/edge vegetation provide important feeding and commuting corridors for a range of species.

The city has significant green spaces through the provision of parks such as the Phoenix Park in particular, St Anne's Park and a number of institutional lands including Trinity College Dublin. The city's parks,

*Scots Pine in Botanic Gardens, Glasnevin. (Photo: Anthony Woods)*

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

These along with roadside edges and undeveloped sites that have been left of their own accord and many of our built structures including buildings and bridges in particular, provide refuges for wildlife. Together, these components of the city's character provide a valuable resource for a wide range of uses.

This natural heritage resource is managed and used for many interests by a range of organisations and individuals. Responsibilities for waterways, parks and green spaces for example are shared among a number of organisations and a significant proportion of space that is important for wildlife is privately owned (gardens and institutional lands in particular). Many individuals and organisations have worked with and collected information on natural heritage in the city over many years. Yet, as a whole, we do not have a clear idea as to what condition our city's natural heritage is in. While there is work ongoing in the city that is benefiting biodiversity, it is clear that there is considerable opportunity for enhancement.

The Dublin City Biodiversity Action Plan Steering Group identified the main issues for biodiversity as a knowledge gap and an awareness deficit. They determined that

*North Bull Island is located in Dublin Bay, one of the most significant conservation sites in the city as it hosts internationally protected habitats like sand dunes, dune slack and mud flats. The area is also internationally important for nesting and wintering waterfowls and is designated as a RAMSAR site (important wetland), Biogenetic Reserve, Wildfowl Sanctuary, Nature Reserve, cSAC and SPA.*

biodiversity is undervalued and suffers due to competing demands. The steering group also identified that direction and good examples are needed.

The proximity of human dwellings and wildlife is a great opportunity to help inform and enthuse people about natural heritage. It also creates some major challenges in trying to protect and enhance space for wildlife. Luckily, Dublin has close cultural connections with much of its wildlife such as Bull Island, The Phoenix Park, its street trees, and its waterways in particular. The challenge will be to make sure this is no longer just taken for granted, that the wider natural heritage is understood and protected (such as bats and birds) and that what is locally and nationally valuable is not eroded but actively protected and enhanced. Raising awareness of what we have, and taking actions to protect it is key to retaining healthy populations of species and enhancing our own appreciation of natural heritage and quality of life.

The formation of a Dublin City Council Biodiversity Officer post, funded by Dublin City Council in association with The Heritage Council, is an action of Dublin City Heritage Plan 2002-2006. This post has built on the work of the Natural Environment actions of the Heritage Plan and has started the process of integrating biodiversity into the work of the city council. The Biodiversity Action Plan is an Objective of the Dublin City Development Plan and will contribute to the City Council's Corporate Plan objective for A Clean and Green City.

## BIODIVERSITY IN CITY PARKS

The city's parks contain significant wildlife resources including woodland, semi-natural grasslands and remnant hedgerows. In doing so, parks support species of local and national importance including otters, bats, hedgehogs and kingfishers. They have a significant amenity and education role in the city and appropriate design and management is required to retain their multifunctional value.

OPW is responsible for the management of properties in state care. This includes high profile sites such as The Phoenix Park, St. Stephen's Green, and the War Memorial Gardens, all of which are National Historic Parks. While their brief is the conservation and restoration of these designed landscapes, the OPW also takes very seriously the Biodiversity and Sustainability issues on all sites. In fact the Phoenix Park Management Plan is currently under review, and incorporated into this process are full flora, fauna and habitat surveys, with recommendation on protecting the rich biodiversity within the park.

DCC Parks Department is implementing the Habitat Management Plans produced for five city parks by Mary Tubridy & Associates.*

*Tubridy, M. 2003. Management Plan for Springdale Park.
*Tubridy, M. 2003. Management Plan for St. Kevin's Park.
*Tubridy, M. 2004. Management Plan for St. Anne's Park.
*Tubridy, M. 2004. Management Plan for Le Fanu Park.
*Tubridy, M. 2004. Management Plan for Bushy Park.
(All Heritage Council & Dublin City Council.)

# Visions and actions

The actions of this plan are identified in two sets of tables: Strategic directions and natural heritage interests. The first of these tables identifies actions under five visions identified for the city. The second table lists the natural heritage interests of the city and is supported by a number of appendices in this document.

**STRATEGIC DIRECTIONS**
- Knowing what we've got
- Spreading the word
- Planning together
- Making space for nature
- Making it work

**NATURAL HERITAGE INTERESTS**
- Mammals
- Fish, Amphibians and Reptiles
- Birds
- Vascular plants
- Selected invertebrate goups
- Selected Fungi and Lichens
- Geology and Geomorphology
- Habitats
- Designated sites
- Invasive and pest species

## Strategic directions

**Knowing what we've got**

It is acknowledged that a range of work has been carried out on natural heritage in the city. There is a need to collate existing information so that the gaps in our knowledge can be identified, to target resources, and to inform decision-making processes.

**Spreading the Word** A key vision is to inform and engage people in biodiversity, to include new audiences and help people recognise and understand biodiversity in the city across all sectors.

**Planning together** Developing policies and mechanisms to incorporate biodiversity and weighting of biodiversity interests appropriately, and providing a framework for creating and enhancing natural heritage in the city is crucial.

**Making space for Nature** Integrating biodiversity into day-to-day and innovative operations, demonstrating how this can be done, and integration into site specific and strategic work programmes are important.

**Making It Work** A number of things need to happen to deliver for biodiversity. Key partnerships should be created with other local authorities and with steering group members. Identifying, providing and maximising resources will be key tasks.

All the strategic directions identified, contribute to living in a quality environment. Biodiversity is a measure of sustainable growth and has a role as an indicator of our quality of life. It also presents us with an opportunity to help address Dublin's carbon footprint and contribution on a national level. It should be key in consideration of our response to challenges posed by climate change. In all, it presents an opportunity to improve our own quality of life and create an easier life for wildlife.

## Principal abbreviations

| | |
|---|---|
| 3d: | Third level institutions |
| AT: | An Taisce |
| BCI: | Bat Conservation Ireland |
| B GAP: | Ballymun Global Action Plan |
| BWI: | Birdwatch Ireland |
| CF: | Community Forum |
| CFB: | Central Fisheries Board |
| CIF: | Construction Industry Federation |
| Codema: | Agency for energy and sustainability in Dublin |
| CWI: | CoastWatch Ireland |
| DCC: | Dublin City Council |
| DCCom: | Dublin Chamber of Commerce |
| DLR: | Dún Laoghaire Rathdown Council |
| DNFC: | Dublin Naturalists' Field Club |
| EPA: | Environmental Protection Agency |
| ERFB: | Eastern Regional Fisheries Board |
| FCC: | Fingal County Council |
| HC: | Heritage Council |
| IPCC: | Irish Peatland Conservation Council |
| ISS: | Irish Seal Sanctuary |
| IWDG: | Irish Whale and Dolphin Group |
| IWT: | Irish Wildlife Trust |
| NBDC: | National Biodiversity Data Centre |
| NBG: | National Botanic Gardens |
| NHM: | Natural History Museum |
| NPWS: | National Parks and Wildlife Service |
| OPW: | Office of Public Works |
| SDCC: | South Dublin County Council |
| WFD: | Water Framework Directive |
| WI: | Waterways Ireland |

# Strategic Directions

## Knowing what we've got: Providing the Information

| ACTION | SPECIFIC PROJECTS | PARTNERS |
|---|---|---|
| **1.1 Use of GIS to:**<br><br>**Fill gaps on priority[1] species and habitats**<br><br>**Interpret data for practical use**<br><br>**Update existing data** | a. Fill information gaps on priority species[1] and habitats in the city<br>i. Bats<br>ii. Birds<br>iii. Otters<br>iv. Red Squirrels<br>v. Salmonids, e.g., salmon and trout species<br>vi. Selected invertebrate groups<br>vii. Hedgerows and Urban Trees<br>viii. Protected Rare, Scarce or Threatened plants<br>ix. Semi-natural grasslands<br>x. Wetlands<br><br>b. Further develop the DC Habitat Mapping Project.[2]<br>Build on DCC habitat mapping project, digitise and update information on priority habitats and species. Provide web-based, user-friendly map of natural heritage resource. Make information available for DCC Development Plan and Local Area Plans (LAPs).<br><br>c. Make information available as appropriate for day-to-day operations, innovative projects and decision-making processes, in particular for brownfield sites and on institutional lands.<br><br>d. Update Dublin Nature Database[3] and existing surveys, e.g., Hedgerow Survey[4].<br><br>e. Collate natural heritage data for Dublin Bay and Dublin's waterways.<br><br>f. Ensure compliance with National Biodiversity Data Centre guidelines. | BCI, BWI, DCC, DNFC, ERFB, NBDC, NBG and 3[d]. |

[1] Priority species and habitats as listed in the tables are not 'priority' as defined by the Habitats Directive but rather are a priority for the Dublin City BAP.

[2] O'Riain, G., Tubridy, M. and Sheridan, O. 2006. *Habitats Survey of High Biodiversity Value Areas in Dublin City, 2006*. Dublin City Council and Heritage Council.

[3] Dublin City Council 2003. *Dublin City: Natural Heritage Surveys.* Dublin City Council and Heritage Council.

[4] Lyons, M. and Tubridy, M. 2006. *A Survey of Ancient and Species Rich Hedgerows in Dublin City.* Dublin City Council and Heritage Council.

## Spreading the word: Raising the profile

| ACTION | SPECIFIC PROJECTS | PARTNERS |
|---|---|---|
| **2.1 Biodiversity awareness campaign** | a. Participate in National and European Biodiversity Conferences and ensure urban biodiversity and biodiversity in Dublin city are well represented. Disseminate content of conferences.<br>b. Incorporate Dublin Bay sessions into conferences nationally.<br>c. Develop programme of awareness raising through data recording initiatives, schools competitions, park events, etc.<br>d. Develop tourist leaflet and trails around the city and on the DCC website.<br>e. Publicise ongoing progress with projects.<br>f. Link with national initiatives and other Local Authorities.<br>g. Raise the profile of Biodiversity Week and create biodiversity presence at other events.<br>h. Build on existing environmental education initiatives including Discovery Science Programmes, Blue Flag, Nature in Parks and Green Schools.<br>i. Incorporate Biodiversity activities at other family fun days or events.<br>j. Conduct biodiversity themed events – National Moth Night, World Wetlands Day, Dawn Chorus, Tree Day, Tree Week and the Rose Festival.<br>k. Incorporate biodiversity component in professional courses, e.g., architects, engineers, etc. | Dublin Zoo, NPWS, HC, DCC, Dublin Tourism, Fáilte Ireland, steering group members, NBG and 3d. |
| **2.2 A Dublin City Biodiversity Centre** | a. Carry out feasibility study to assess components of and identify possible locations for a biodiversity educational centre in the city. | DCC, NPWS, DNFC, ENFO, Dublin Zoo, NHM, Libraries, NBG, DoEHLG, HC, Dublin Business, NBDC and NGOs. |
| **2.3 Biodiversity section on the DCC website** | a. Enhance web information currently available.<br>b. Link with current projects.<br>c. Participate in redevelopment of the DCC website.<br>d. Make datasets and reports more available.<br>e. Provide biodiversity education and recording facility. | DCC, HC, DNFC and NBDC. |

## Spreading the word: Raising the profile

| ACTION | SPECIFIC PROJECTS | PARTNERS |
|---|---|---|
| **2.4 Widen sectoral involvement in biodiversity issues** | a. Run Biodiversity in Business event.<br>b. Source demonstration examples for business.<br>c. Run Biodiversity in Construction workshop and source demonstration examples.<br>d. Conduct biodiversity training with professional bodies e.g. Royal Institute of Architects in Ireland, Irish Planning Institute, Engineers Ireland, Irish Landscape Institute.<br>e. Coordinate with sectoral 'green plans'.<br>f. Identify sponsors for community projects.<br>g. Identify biodiversity champions for local habitats and species.<br>h. Provide guidance for ecological standards in business and sustainability/corporate responsibility issues.<br>i. Identify pilot projects with nurseries and gardens centres relating to invasive species exotic species and identify positive actions for biodiversity.<br>j. Identify companies that have green policies and want to get involved in biodiversity projects. | DCC, DCCom, IBEC, Codema, CIF, Dublin Zoo. |
| **2.5 Facilitate biodiversity education in primary and secondary curriculum** | a. Extend the DCC 'Nature in Parks' programme.<br>b. Create a DCC biodiversity prize at Young Scientists and other school events.<br>c. Consolidate wildlife resources and training available to teachers (packs, projects, contacts). | DCC, Dublin Zoo, NGOs and ENFO. |
| **2.6 Develop interpretation strategy for wildlife** | a. Use interpretation tools such as panels, website, school resources, posters, wildlife trails.<br>b. Interpretation detailing natural heritage interests of South Dublin Bay.<br>c. Interpretation of waterways.<br>d. Interpretation of parks. | DCC, ERFB, WI, OPW, DNFC, NBG, NGOs. |

## Spreading the word: Raising the profile

| ACTION | SPECIFIC PROJECTS | PARTNERS |
|---|---|---|
| **2.7 Roll out best practice through information sharing for professionals** | a. Run training events for relevant departments in Local Authorities (LAs) in the greater Dublin area and engage professional institutes.<br>b Develop and run best practice and information sharing events promoting and demonstrating best practice design and management of Parks, open spaces and urban design.<br>c Raise awareness and provide working examples of design measures for bats, birds, otters, salmonids[5] and green roofs.<br>d. Raise awareness and provide best practice guides for parks, graveyards,[6] school grounds, business, industry, brownfield sites, private gardens, institutional lands, golf courses, waterways, coastal amenity areas and riparian zones.<br>e. Extend existing work on sustainable urban drainage systems (SUDS) and Integrated Constructed Wetlands (ICWs).<br>f. Support and establish incentives for:<br>– School grounds grant scheme and competition.<br>– Care and maintenance of graveyards.<br>– Gardening guidelines.<br>– Provision of bird-roosting platforms in water bodies. | DCC, Professional Bodies, BWI, OPW, ERFB, WI, NBG, CBW, NGOs, DCComm and AT. |
| **2.8 Widen citizen training and engage community in biodiversity issues** | a. Enable residents' associations to take care of wildlife spaces for example by establishing NeighbourWood schemes.<br>b. Run community and biodiversity training events with Community Officers.<br>c. Develop the concept of Community Wildlife Plans e.g. within Council housing and resident's association.<br>d. Use community-based projects as demonstration templates and develop for other areas and communities. Wetlands in parks wildlife gardens and allotments are examples. Link with existing outreach programmes.<br>e. Widen tidy towns wildlife category and publicise.<br>f. Identify business sponsorship for community environment projects.<br>g. Encourage schools to develop wildlife gardens. Award merit certificates to participants. | DCC, B GAP, ERFB, Dublin Zoo and steering group. |

[5] A member of the Family Salmonidae which includes Salmon, Trout and Whitefish. (The BAP refers to Atlantic Salmon, Sea trout and Brown trout in Dublin City.)
[6] Wilson, F., Goodbody, R. and Nairn, R. 2004. *Dublin City Graveyards Study.* Dublin City Council.

## Spreading the word: Raising the profile

| ACTION | SPECIFIC PROJECTS | PARTNERS |
|---|---|---|
| **2.9 Placing a value on biodiversity** | a. Actively link biodiversity to wider sustainability issues such as flooding, climate change and waste.<br>b. Link with access initiatives such as pedestrian network initiatives, e.g., Sutton to Sandycove (S2S) cycleway.<br>c. Create policy to design and interpret wild spaces on amenity networks appropriately. | NPWS and DCC. |

## Planning together: Planning for biodiversity

| ACTION | SPECIFIC PROJECTS | PARTNERS |
|---|---|---|
| **3.1 Develop LA policies and mechanisms to protect BAP priority habitats and species** | a. Adopt planning conditions for priority habitats and species.<br>b. Identify processes to take biodiversity into account early in decision-making process such as:<br>i. Flag sensitive interests by mapping information.<br>ii. Prioritise locations, e.g., the developing sand spit at Merrion Gates.<br>iii. Create a checklist or appraisal guide for planners.<br>c. Provide guidelines for ecological report briefs to standardise the quality of ecological reports and to ensure local interests and context are incorporated.<br>d. Identify methods of weighting of biodiversity in development-planning decisions.<br>e. Pursue higher proportion of levies allocated for ecological management and make comparison with other councils.<br>f. Pursue '% for biodiversity' scheme from capital projects.<br>g. Define policies and ecological objectives for Waterway Conservation Areas.<br>h. Raise awareness within DCC and Professional Bodies of the 30m river width recommendation in the Greater Dublin Strategic Drainage Study.<br>i. Improve the provision of riparian habitats, ICWs and wetlands in private developments. | DCC, other Local Authorities, Tree Council of Ireland, NGOs, steering group and Professional fora. |
| **3.2 Integrated Management Plan for Dublin Bay** | a. Collate existing information and carry out an assessment of the overall ecological status of Dublin Bay and its interests.<br>b. Identify information gaps, e.g., seal population, Salmonid, bird usage and intertidal ecology.<br>c. Identify key roost sites for waterbirds and raise awareness of their significance within DCC departments. Pursue protection of these sites.<br>d. Raise awareness of sensitivities associated with Dublin Bay, e.g., high tide roosting sites and incorporate strict planning conditions into proposed developments accordingly.<br>e. Identify additional anchor points for emergency incidents at Dublin Port. | NPWS, BWI, DNFC, 3d, Dublin Bay Management Authority and DCC. |
| **3.3 Sustainability issues and Dublin's impact** | a. Work with partners to integrate biodiversity issues as part of the assessment of Dublin's carbon footprint<br>b. Identify practical measures to reduce impacts created by Dublin and deal with implications of climate change in urban and coastal contexts.<br>c. Incorporate biodiversity components into green/sustainability audits of DCC buildings, parks and other properties | Codema, DCC, NGOs. |

## Making space for nature: Delivery

| ACTION | SPECIFIC PROJECTS | PARTNERS |
|---|---|---|
| **4.1 Identify and protect new Local Biodiversity Areas and Urban Nature Reserves** | a. Identify, protect and interpret local biodiversity hotspots.<br>b. Establish conservation objectives.<br>c. Implement management plans.<br>d. Map and raise awareness and profile of such sites.<br>e. Emphasise Conservation Areas of the rivers Liffey, Dodder and Tolka.<br>f. Survey and focus on railway sidings, brownfield sites, wild riparian zones and green spaces or pocket parks.<br>g. Establish Urban Nature Parks.<br>h. Produce a Management Plan for Irishtown Nature Park.<br>i. Link with greenspace strategy. | DCC, NPWS, DNFC, other Dublin LAs, ERFB, Iarnród Éireann, WI, HC and steering group. |
| **4.2 Implement Parks and Open Space Work Programmes** | a. Develop and integrate habitat management work programmes into management plans for all parks.<br>b. Produce a detailed biodiversity strategy for management of DCC Parks.<br>c. Include biodiversity requirements into Park Maintenance Contracts.<br>d. Carry out habitat creation and enhancement works.<br>e. Maintain existing biodiversity areas within parks.<br>f. Trial best practice management for biodiversity in a park, street and beach basis to facilitate development of best practice throughout, including:<br>i. Creation and interpretation of wild zones.<br>ii Identifying alternative means to mechanical cleaning of beaches.<br>g. Implement programme for removal of invasive species.<br>h. Incorporate ecology in design briefs for new parks and associated infrastructure.<br>i. Implement biodiversity training component into PMDS in LA.<br>j. Identification and protection of 'resting places' of animals in parks e.g. badger setts, fox dens, bat roosts, wasp hives, bird roosting and feeding sites etc.<br>k. Create a demonstration wildlife-friendly garden for public education.<br>l. Provision of interpretation.<br>m. Encourage planting of wildlife friendly hedge/shrub planting along roads.<br>n. Develop appropriate urban planting list.<br>o. Develop a policy to reduce hard landscaping in the city.<br>p. Survey urban trees and develop a tree strategy for the city. | DCC, NGOs, B GAP, Professional bodies, NBG, Tree Council of Ireland. |

## Making space for nature: Delivery

| ACTION | SPECIFIC PROJECTS | PARTNERS |
|---|---|---|
| **4.3 Management of sites and species protected by law** | a. Liaise with NPWS to ascertain conservation objectives for designated sites in order to inform best management practice.<br>b. Ensure LA management régime conforms to conservation objective requirements, e.g., produce Management Plan for North Bull Island.<br>c. For all designated sites and Local Biodiversity Areas:<br>i. Raise awareness within DCC and the public of significance of site<br>ii. Determine and implement appropriate management<br>iii. Ensure no loss in extent or integrity of listed habitats/species<br>iv. Ensure appropriate assessment of all proposed developments | NPWS and DCC |

## Making it work: Targeting resources

| ACTION | SPECIFIC PROJECTS | PARTNERS |
|---|---|---|
| **5.1 Maximise existing roles** | a. Liaise with LA staff through training events and discussion.<br>b. Facilitate Community Officers to deliver for biodiversity.<br>c. Link with existing professional training programmes to include biodiversity component.<br>d. Incorporate Biodiversity Objectives across divisions through PMDS in DCC. | DCC, NGOs, NBG, Professional bodies and Dublin Zoo. |
| **5.2 Develop a Biodiversity Education Officer post** | a. Pursue the appointment of a citywide Biodiversity Education Officer post between organisations. Incorporate biodiversity and sustainability in an urban context. | All. |

## Making it work: Targeting resources

| ACTION | SPECIFIC PROJECTS | PARTNERS |
|---|---|---|
| **5.3 Develop a data development programme for biodiversity** | a. Pursue the development of Data Officer role to manage natural heritage data, interpret data for planning queries, input data for community web based resources and update natural heritage metadata. | All. |
| **5.4 Liaise with DoEHLG** | a. Identify DoEHLG resources for biodiversity projects and posts<br>b. Enhance the role of DoEHLG in consultation processes. | DCC and DoEHLG (NPWS). |
| **5.5 Create a multidisciplinary team within DCC** | a. Form an internal biodiversity contact team representing different departments to develop policy and update on best practice, project development, etc. | DCC. |
| **5.6 Ensure implementation** | a. Undertake annual progress reviews. | DCC, DNFC and steering group. |

## Species, habitats and designated sites Abbreviations

Bern Convention on the conservation of European wildlife and natural habitats 1979

Biog European network of Biogenetic reserves (1973)

BoCCI Birds of Conservation Concern Ireland (Red, Amber and Green lists)

Bonn Convention on the conservation of migratory species and wild animals 1979

CA Conservation Area as defined in the Dublin City Development Plan

cSAC Candidate Special Area of Conservation. Habitat listed on Annex I of the EU Habitats Directive and afforded European legal protection. Same protection as non-candidate.

dSAP Draft Species Action Plan. Written by DoEHLG for only a few species nationally. Not yet published.

ECHR European Communities (Natural Habitats) Regulations, 1997. Transpose the EU Habitats Directive into Irish law.

EU BD European Union Directive 79/409/EEC on the conservation of wild birds. Commonly called the Birds Directive. Areas with species listed on Annex 1 that occur in internationally important numbers are legally protected. These areas designated for birds under the EU BD are called Special Protection Areas (SPAs).

EU HD European Union Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna. Commonly called the Habitats Directive. Areas with habitats listed on Annex I (that exist to required specifications) or fauna listed on Annex II (at internationally important numbers) are legally protected and called candidate Special Areas of Conservation (cSAC). Flora listed on Annex I are individually protected. Species listed under Annex IV of the EU HD are afforded strict protection. Species listed under Annex III are to be managed whereby their disturbance is only under licence with specified conditions.

FCA Fisheries (Condolidation) Act 1959 (as amended by the Fisheries (Amendment) Act 1999).

FFD Freshwater Fish Directive (78/659/EC).

IBA Important Bird Area. This is a site listed by BirdLife International (of which BirdWatch Ireland is affiliated).

I Indeterminate category in Red Data Book

II Internationally Important category in Red Data Book

MAB The Man and Biosphere Reserve

NR Nature Reserve. Special protection given to species that occur in this area.

NBP National Biodiversity Plan (2002). Written by DoEHLG under Convention on Biodiversity requirements. Sets out national objectives and specifies targets for LAs.

PAD: The Local Government (Planning and Development) Act 2000.

pNHA Proposed Natural Heritage Area. Given legal status under The Wildlife Act, 1976 due to national importance of habitat/species in that area.

R Ramsar site designated under the Ramsar Convention on wetlands (1971 as amended). Ramsar sites are wetlands of international importance.

RDB Red Data Book. Compiled using strict criteria of International Union for Conservation of Nature. Lists species of conservation concern and gives defined status to each depending on status in the country e.g. Rare, Vulnerable, Endangered, Nearly Extinct, etc. In Ireland there are RDBs for vertebrates, vascular plants and bees.

SAAO Special Amenity Area Order. Title given to area identified within a LA as having special amenity value.

SAP All Ireland Species Action Plans. Produced by DoEHLG for 4 species to date.

SPA Special Protection Area. Legally protected area for birds. See definition under EU HD above.

SWR: EC (Quality of Salmonid Waters) Regulations 1988. Transposes FFD into Irish law.

WA The Wildlife Act, 1976 as amended in 2000. Founding Irish legislation listing protected species in Ireland and laying out strict legislation for the protection and enforcement of wildlife in the country. Many amendments but the most thorough in 2000.

WPA The Local Government (Water Pollution) Act 1999 (as amended).

WS Wildlife Sanctuary. Certain activities not allowed in this area for protection of wildlife.

### URBAN FOXES

*Dave Wall, steering group member*

Foxes have made the streets of Dublin their home for many years now with sightings of foxes in Dublin city centre recorded from Victorian times. Foxes occur at higher densities in the city than in rural areas; this is primarily due to the ready availability of food in the urban environment. The diet of urban foxes is varied and opportunistic including items such as worms, insects, food scraps, fruit, carrion, small mammals and bin contents. It is an urban myth that foxes are suffering due to the introduction of wheelie bins as rubbish scraps form only a small part of their diet and they can easily make up for it with other food sources.

Foxes are found throughout the Dublin City Council area with an average density of one fox family group per kilometre square, though some areas have 4-5 times this density. Foxes even breed in Merrion Square and in gardens adjacent to St. Stephen's Green. Fox dens have been found in gardens, under sheds, in wrecked cars and even inside houses.

Foxes are a true part of our urban biodiversity and thousands of Dublin's residents feed their local foxes and enjoy the sight of Ireland's largest carnivore right on their doorstep. (Photo: ©Istockphoto)

# Natural Heritage Interests

## MAMMALS

**Action: Raise awareness – Collation and collection of information – Protection and enhancement measures**

| Common/technical name | Local | National | International | Focus | Actions | Partners |
|---|---|---|---|---|---|---|
| Brown long-eared bat (*Plecotus auritus*)<br>Leislers bat (*Nyctalus noctula*)<br>Daubenton's bat (*Myotis daubentonii*)<br>Whiskered bat (*Myotis mystacinus*)<br>Natterers bat (*Myotis nattereri*)<br>Common pipistrelle (*Pipistrellus pipistrellus*)<br>Nathusius's pipistrelle (*Pipistrellus nathusi*)<br>Soprano pipistrelle (*Pipistrellus pygmaeus*) | BAP | dSAP, ECHR, RDB (II) and WA | EU HD Annex IV and Bern (II) | Summer maternity roosts, Spring gathering roosts, Winter hibernation roosts, e.g., stone bridges, old stone building attics and crevices, mature trees, buildings near waterbody.<br>Dependent upon vegetated 'corridors', insect-attracting plants and waterbodies for commuting and feeding.<br>Risks include loss of roosts, loss and fragmentation of commuting/feeding 'corridors', use of toxic pesticides to treat roof timber, entombent in bridges during maintenance works, negative public perception.<br>Refer to Bat Mitigation Guidelines,[7] DCC reports[8] and NRA Guidelines[9]. | 1.0, 3.1-3.3, 4.1-4.3, 5.1-5.6. | DCC, NPWS, BCI, OPW, Dublin Zoo, HC, 3d, schools, NBDC. |
| Otter (*Lutra lutra*) | BAP | dSAP, ECHR, RDB (II) and WA | EU HD Annexes II, IV and Bern (II) | Watercourses, coast. | 1.0, 2.1-2.9, 3.1-3.2, 4.1-4.3, 5.1-5.6. | DCC, OPW, WI, NPWS, WI, IWT, ERFB and HC. |
| Irish Hare (*Lepus timidus hibernicus*) | | ECHR, SAP, RDB (II) and WA. | EU HB Annex V and Bern (II) | Grassland, dunes and saltmarsh.<br>Threats include disturbance from recreational activity and loss of habitat. Mainly confined to Bull Island in the city. | 1.0, 2.1-2.9, 4.1, 4.2, 5.1-5.6 | DCC, NPWS, IWT, HC, Bull Island Action Group. |

7 Kelleher, C. and Marnell, F. 2006. Bat Mitigation Guidelines for Ireland. *Irish Wildlife Manuals*, No. 25. National Parks and Wildlife Service, DoEHLG, Dublin.

8 Keeley, B. 2002. *An assessment of the bridges of the Royal and Grand Canals for the presence of bats prior to restoration works.* Dublin City Council.

9 www.nra.ie/Environment/EnvironmentalConstructionGuidelines/

# MAMMALS

## Action: Raise awareness – Collation and collection of information – Protection and enhancement measures

| Common/technical name | Local | National | International | Focus | Actions | Partners |
|---|---|---|---|---|---|---|
| Grey Seal (*Halichoerus grypus*)<br><br>Common Seal (*Phoca vitulina*) | | WA<br><br>WA | EU HD Annexes II and V. | Rocky shores and cliffs, occasionally in R. Liffey.<br><br>Sheltered shores, occasionally in R. Liffey, haul out on Nth. Bull Island. | 1.0, 2.1, 2.3, 2.5, 2.6, 2.9, 3.2, 4.1, 4.3, 5.1-5.6. | DCC, ISS, NPWS, IWT, HC. |
| Harbour porpoise (*Phocoena phocoena*) | | WA | EU HD Annexes II and IV | Coastal and open sea. | 1.0, 2.1-2.9, 3.2, 4.1, 5.1-5.5. | DCC, ISS, IWDG, IWT, HC and NPWS. |
| Red Squirrel (*Sciurus vulgaris*) | BAP | dSAP and WA | Bern (III) | Woodland areas, parks, institutional lands and gardens. | 1.0, 2.1-2.9, 3.1, 4.1-4.3, 5.1-5.6. | DCC, DLR, UCD, Dublin Zoo, HC, OPW and NPWS. |
| Hedgehog (*Erinaceous europaeus*) | | RDB (II) and WA | Bern (II) | Gardens and parks. | 1.0, 2.1-2.9, 4.1, 4.2, 5.1-5.6. | DCC, NPWS, IWT, 3d, schools, HC and OPW. |
| Badger (*Meles meles*) | | RDB (II) and WA | Bern (III) | Woodland and parks | 1.0, 2.1-2.9, 4.1, 4.2, 5.1-5.6. | DCC, IWT, 3d, NPWS, HC and OPW. |
| Fox (*Vulpes vulpes*) | | | | All areas. | 1.0, 2.1-2.9, 4.1, 5.1-5.6. | DCC, schools, IWT, NPWS, HC and OPW. |

# Fish, Amphibians and Reptiles

## Action: Raise awareness – Collation and collection of information – Protection and enhancement measures

| Common/technical name | Local | National | International | Focus | Actions | Partners |
|---|---|---|---|---|---|---|
| Atlantic salmon (*Salmo salar*) | BAP | ECHR and RDB (II)<br>FCA<br>PAD<br>SWR<br>WPA | EU HD Annexes II and V and Bern (III<br>FFD | Rivers Dodder and Liffey and estuarine areas encompassing all life stages from spawning to migration. Reference must be made to ERFB guidelines on construction/development of rivers www.fishingireland.net/environment/construction anddevelopment.htm | 1.0, 2.1-2.9, 3.3, 4.1, 4.2, 5.1-5.6. | DCC, NPWS, ERFB, WI, OPW, HC. |
| Brook Lamprey (*Lampetra planeri*)<br><br>River Lamprey (*Lampetra fluviatilis*) | | RDB (I)<br><br>RDB (I) | EU HD Annex II<br><br>EU HD Annex II | Pollution of waterways and unmanaged development along waterways are threats.*<br><br>Rivers Liffey and Dodder. | 1.0, 2.1-2.9, 3.3, 4.1, 4.2, 5.1-5.6. | DCC, NPWS, ERFB, WI, OPW, HC. |
| Sea trout (*Salmo trutta*)<br><br>Brown trout (*Salmo trutta*) | BAP<br><br>BAP | FCA<br>PAD<br>SWR<br>WPA | FFD | Rivers Dodder and Liffey and estuarine areas.<br><br>Rivers Liffey, Dodder and Tolka.<br><br>Threats as above* | 1.0, 2.1-2.9, 3.2, 4.1, 4.2, 5.1-5.6. | DCC, ERFB, WI, NPWS, HC. |
| Common Frog (*Rana temporaria*) | | RDB (II) and WA | EU HD Annex V and Bern (II) | Wetlands and garden ponds. Decreasing wetlands area is threatening frog populations. | 1.0, 2.1-2.9, 4.1, 4.2, 5.1-5.6. | DCC, NPWS, IPCC, IWT, WI, schools and HC. |
| Common newt (*Triturus vulgaris*) | | The Wildlife Act, 1976 (Protection of wild animals) Regulations, 1980. | | Parks and Gardens near ponds/waterbodies. Requires ponds for life cycle, thus decreasing wetland area is a threat. | 1.0, 2.1-2.9, 4.1, 4.2, 5.1-5.6. | DCC, NPWS, IWT, schools, OPW and HC. |

# Fish, Amphibians and Reptiles

**Action: Raise awareness – Collation and collection of information – Protection and enhancement measures**

| Common/technical name | Local | National | International | Focus | Actions | Partners |
|---|---|---|---|---|---|---|
| Viviparous lizard (*Lacerta vivipara*) | | The Wildlife Act, 1976 (Protection of wild animals) Regulations, 1980. | | Only reptile in Ireland. Sand dunes, e.g., Bull Island, hedgerows and gardens. | 1.0, 2.1-2.9, 4.1, 4.2, 5.1-5.6. | DCC, NPWS, IWT, schools, OPW and HC. |

# Birds

**Action: Raise awareness – Collation and collection of information – Protection and enhancement measures**

| Group | Local | National | International | Focus | Actions | Partners |
|---|---|---|---|---|---|---|
| Wintering waterbirds and Breeding gulls and terns<br><br>Land birds of conservation interest | BAP | BoCCI (Red and Amber lists) and WA | EU BD Annex I, Bern (III) and Bonn (II) | See Appendix III for list of species. | – Identification and protection of key roosting and feeding sites e.g. developing spit between Merrion Gates and Booterstown Marsh<br>– Creation of nesting islands in ornamental /constructed ponds and wetlands<br>– Identification and protection of bird of prey nesting sites<br>Also: 1.0, 2.1-2.9, 3.1, 3.2, 3.3, 4.1-4.3 and 5.1-5.6. | DCC, NPWS, BWI, Dublin Bay Management Authority, HC, OPW and 3[d]. |

# Vascular Plants

**Action: Raise awareness – Collation and collection of information – Protection and enhancement measures**

| Group | Local | National | International | Focus | Actions | Partners |
|---|---|---|---|---|---|---|
| Priority Plant Species (as defined by Flora Protection Order, 1999) | BAP | RDB, Flora Protection Order, 1999 and WA. | EU HD Annex II | Species listed in Appendix IV. | 1.0, 2.1-2.9, 3.1-3.3, 4.1-4.3, 5.1-5.6. | DCC, Dublin Zoo, NPWS, NBG, DNFC, IWT, HC, OPW and 3d. |
| Trees | BAP | | | Champion trees, native trees, mature trees and wildlife hosts. | 1.0, 2.1-2.9, 3.1, 3.3, 4.1, 4.2, 5.1-5.6. | DCC, DNFC, NBG, 3d, Tree Council of Ireland, NGOs and HC. |

# Selected Invertebrate Groups

**Action: Raise awareness – Collation and collection of information – Protection and enhancement measures**

| Group | Local | National | International | Actions | Partners |
|---|---|---|---|---|---|
| Water Beetles<br>Dragon flies<br>Butterflies<br>Moths<br>Bees | BAP | Bees: RDB<br>Waterbeetles: draft Regional RDB | | a. For bees and waterbeetles; survey for RDB species in Dublin city.<br>b. Assess relationship between waterbeetles and water quality in Dublin city.<br>c. Link in with national initiatives, e.g., MothIreland project, DragonFlyIreland project, National Butterfly Monitoring project<br><br>Also: 1.0, 2.1-2.9, 3.1, 3.3, 4.1, 4.2, 5.1-5.6. | DCC, NBDC, 3d, DNFC, HC, NMM, NPWS. |

# Selected Fungi and Lichens

**Action: Raise awareness – Collation and collection of information – Protection and enhancement measures**

| Group | Local | International | Actions | Partners |
|---|---|---|---|---|
| Fungi<br>a. Marram Oyster (*Hohenbuehelia culmicola*)<br>b. Waxcaps (*Hygrocybe* species)<br>c. Cage fungus (*Clathrus ruber)* | BAP | Marram Oyster: proposed for Annex I Bern Convention and on UK RDB<br>Waxcaps: On RDB of 10 European countries | Identify locations of listed species and initiate conservation actions. Bull Island is stronghold for Marram Oyster and Waxcaps. Clontarf is only known location for *Clathrus ruber*.<br>Raise awareness of threat by fertiliser and weedkillers to fungal species<br>Liaise with householder that has Cage fungus in garden in Clontarf | DCC, NPWS, IWT, OPW DNFC, 3d and HC. |
| Lichens | BAP | | Establish which are priority indicator species for the city and and initiate conservation actions.<br>Raise awareness of importance of this group as indicators of atmospheric and climatic change | DCC, DNFC, NPWS, NBG, 3d and HC. |

# Geology and Geomorphology

**Action: Raise awareness – Collation and collection of information – Protection and enhancement measures**

| Group | Focus | Actions | Partners |
|---|---|---|---|
| Those listed for Dublin city on the draft geological heritage list compiled by the Geological Society of Ireland (GSI):<br><br>North Bull Island<br><br>Dodder<br><br>Guinness Wells<br><br>Temple Bar Street Well | <br><br>Evolving sand spit<br><br>Lower Carboniferous sections: Smurfits and Donnybrook Mills<br><br>Victorian borehole wells (1st in country)<br><br>Street Well on Eustace St. | a. Liaise with NPWS in the designation process for Earth Science pNHAs<br>b. Map sites digitally<br>c. Raise awareness and make information available within DCC and amongst public<br>d. Protect from inappropriate development<br><br>Also: 1.0, 2.1-2.9, 4.1, 5.1-5.6. | DCC, GSI, NPWS, DNFC, ENFO and HC. |

# Habitats

## Action: Raise awareness – Collation and collection of information – Protection and enhancement measures

| Habitat | Local | National | Intern'l | Examples | Focus | Actions | Partners |
|---|---|---|---|---|---|---|---|
| Sand dunes (CD1, CD2, CD3)[10] | | ECHR | EU HD Annex I | Shellybanks, North Bull Island and Merrion Gates | Undesignated and designated sites. | – Identify conservation objectives<br>– Support production of Management Plans<br>– Determine and implement best practice.[11]<br>– Prevent loss of habitat extent.<br><br>Also:<br>1.0, 2.1-2.9, 3.1, 3.2, 4.2, 4.3, 5.1-5.6. | All |
| Annual vegetation of drift lines (LS1) | | ECHR | EU HD Annex I | Beaches at Merrion and Sandymount Strands | | | |
| Coastal lagoon (CW1) | | ECHR | EU HD Annex I | North Bull Island | | | |
| Saltmarsh (CM1, CM2) | | ECHR | EU HD Annex I | North Bull Island | | | |
| Mud flats and sand flats | | ECHR | EU HD Annex I | Beaches at Merrion and Sandymount strands, Dollymount strand and Tolka Basin sand and mud flats (the latter two are not designated for this habitat). | | | |
| Estuary | | ECHR | EU BD* | Bull Island*, Tolka*, Liffey and Dodder estuaries | | | |
| Semi-natural grasslands | BAP | | | Gallanstown Waterworks at Parkwest | Areas identified in habitat mapping (footnote no. 2, page 15) | – Identify locations<br>– Prioritise within DCC<br>– Raise public awareness<br>– Prevent loss of habitat extent | All |

[10] Code follows Fossitt (2000) classification of habitats.

[11] Biosphere Environmental Services 2006. *Management of Beaches in South Dublin Bay*. Dublin City Council.

# Habitats

## Action: Raise awareness – Collation and collection of information – Protection and enhancement measures

| Habitat | Local | National | Intern'l | Examples | Focus | Actions | Partners |
|---|---|---|---|---|---|---|---|
| Waterbodies<br>e.g. Reed and large sedge swamps (FS1), Lakes (FI), Other artificial lakes and ponds (FL8), Depositing lowland rivers (FW2), Canals (FW3) and Drainage ditches (FW4) | BAP | pNHA (canals) | | – Gallanstown Waterworks at Parkwest.<br>– Royal and Grand Canals<br>– Small rivers and streams | – Areas identified in Habitat Mapping (footnote no. 2, page 15)<br>– Integrated Constructed Wetlands (ICWs) | – Prevent loss of extent.<br>– Develop Integrated Constructed Wetlands (ICWs)<br>Also: 1.0, 2.1-2.9, 3.1, 3.2, 4.2, 4.3, 5.1-5.6. | All. |
| Hedgerows<br>(WL1) | BAP | National Bio-diversity Plan (2002) | | – Cherry Orchard<br>– Walkinstown Park | – Areas identified in Habitat Mapping (footnote no. 2, page 15)<br>– Townland boundaries | – Prevent loss of present extent<br>– Encourage planting of native species hedgerows.<br>Also: 1.0, 2.1-2.9, 3.1, 3.2, 4.2, 4.3, 5.1-5.6. | All. |

# Designated Sites

## Action: Raise awareness – Collation and collection of information – Protection and enhancement measures

| Habitat | Designation | National | International | Brief Description | Actions | Partners |
|---|---|---|---|---|---|---|
| Dublin Bay | IBA | | IBA<br>International designations detailed below. | A shallow sandy bay with intertidal sand and mudflats situated between Bailey Lighthouse at Howth and Sorrento Point at Dalkey. The principle rivers are the Liffey, Tolka and Dodder. | 1.0, 2.1-2.9, 3.1, 3.2, 4.2, 4.3, 5.1-5.6. | All. |
| North Bull Island | BIOG, MAN, NR, R, SAAO, cSAC, SPA and WS. | pNHA (206), Nature Reserve (North Bull Island) 1988, WS and SAAO.<br>Flora Protection Order (1999) (Lesser Centaury, Hemp Nettle and Meadow saxifrage)<br>Nationally important invertebrates (Orders Diptera, Hemiptera and Hymenoptera)<br>RDB vascular plants (Spring Vetch and Wild Sage) | EU HD Annex I for 7 habitats<br>EU HD Annex II for Petalwort<br>RAMSAR<br>Unesco Man and Biosphere Reserve<br>Biogenetic Reserve<br>Part of North Dublin Bay cSAC<br>Part of North Bull Island SPA | The site covers all the inner part of Nth. Dublin Bay, with the seaward boundary extending from Bullwall lighthouse across to Drumleck Point at Howth Head. It is a sand spit that developed in the 19th and 20th centuries. Part of the area (118ha) is privately owned, the remaining (1318ha) is state owned. The island is covered with dune grassland. An extensive salt marsh lies to the northwest and at extreme low tides there are extensive mud flats between the island and the mainland. The reserves are of international scientific importance for Brent Geese and also on botanical, ornithological, zoological and geomorphological grounds. Established 21 September, 1988.<br>EU HD Annex I habitats: Fixed coastal dunes (2130),[2] Marram/shifting dunes (2120), Embryonic shifting dunes (2110), Dunes with creeping willow (2170), Dune slack (2190), Salicornia mud and sand flats (1310) and Mudflats and Sandflats (1140).<br>EU HD Annex II species: Petalwort (*Petallophyllum ralfsii*).<br>EU BD SPA: regularly exceeds >20,000 waterfowl. See Appendix III for birds.<br>See Appendix IV for High priority plant species for North Bull Island. | 1.0, 2.1-2.9, 3.1, 3.2, 4.2, 4.3, 5.1-5.6. | All. |

# Designated Sites

## Action: Raise awareness – Collation and collection of information – Protection and enhancement measures

| Habitat | Designation | National | International | Brief Description | Actions | Partners |
|---|---|---|---|---|---|---|
| North Dublin Bay[12] | cSAC (site no. 206).[13] | ECHR | EU HD Annex I (cSAC) | The site covers the inner part of Nth. Dublin Bay, the seaward boundary extending from the Nth. Bullwall Lighthouse to the Martello Tower at Howth Head.<br>Annex I Habitats: Fixed dunes (2130), Marram/shifting dunes (2120), Embryonic shifting dunes (2110), Dune slack (2190), Annual vegetation of drift lines (1210), Salicornia mud and sand flats (1310), Atlantic salt meadows (1330), Mediterranean salt meadows (1410), Mud and sand flats (1140)<br>Annex II species: Petalwort | 1.0, 2.1-2.9, 3.1, 3.2, 4.2, 4.3, 5.1-5.6. | All. |
| South Dublin Bay | cSAC (210) | ECHR | EU HD Annex I (cSAC) | The site lies south of the River Liffey and extends from the South Wall to the West Pier at Dún Laoghaire. The boundary between DLR and DCC is just North of Booterstown Marsh. The largest stand of Eelgrass on the east coast occurs at Merrion Gates. New habitats are developing just south of Merrion Gates including embryonic dunes and a sand spit. This area is becoming increasingly important as a high tide roost site for waterfowl.<br>EU HD Annex I habitat: Sand and mud flats (1140). | 1.0, 2.1-2.9, 3.1, 3.2, 4.2, 4.3, 5.1-5.6. | All. |

12 The various designations of Dublin Bay e.g. IBA, cSAC and SPA, are not mutually exclusive but overlap each other (see Appendix V).

13 Codes allocated for an Annex I habitat as per European Commission Interpretation Manual of European Union Habitats, 2003.

# Designated Sites

## Action: Raise awareness – Collation and collection of information – Protection and enhancement measures

| Habitat | Designation | National | International | Brief Description | Actions | Partners |
|---|---|---|---|---|---|---|
| Sandymount Strand/Tolka Estuary | SPA (4024) | ECHR | EU BD Annex I (SPA) | The site comprises a substantial part of Dublin Bay. It includes almost all of the intertidal area in the South Bay, as well as much of the River Tolka estuary to the north of the R. Liffey.<br><br>The site is of great ornithological importance, being of international importance for Brent Goose and of national importance for six waterfowl species. It is also classified as of international importance. All of the tern species using the site are listed on Annex I of the EU Birds Directive, as are Bar-tailed Godwit and Mediterranean Gull.<br><br>Brent Goose occur regularly and newly arrived birds in the autumn feed on the eelgrass bed at Merrion. The site supports nationally important numbers of a further six species: Oystercatcher, Ringed Plover, Knot, Sanderling, Dunlin, and Bar-tailed Godwit. Other species which occur in smaller numbers include Great Crested Grebe, Grey Plover, Curlew, Redshank and Turnstone.<br><br>The south bay is an important tern roost in the autumn (mostly late July to September). Up to 11,000 terns were recorded in Autumn 2006 including Common Tern, Arctic Tern and Roseate Tern. | 1.0, 2.1-2.9, 3.1, 3.2, 4.2, 4.3, 5.1-5.6. | All. |

# Designated Sites

## Action: Raise awareness – Collation and collection of information – Protection and enhancement measures

| Habitat | Designation | National | International | Brief Description | Actions | Partners |
|---|---|---|---|---|---|---|
| North Bull Island | SPA (4006) | ECHR, some pNHA, North Bull Island Nature Reserve and SAAO. | EU BD Annex I (SPA) | The site covers all the inner part of Nth. Dublin Bay, with the seaward boundary extending from Bullwall lighthouse across to Drumleck Point at Howth Head.<br><br>Annex I Birds Directive Species that occur here are Little Tern, Golden Plover, Bar-tailed Godwit, Ruff and Short-eared owl. Waterfowl in internationally and nationally significant numbers flock to North Bull Island. It regularly supports in excess of 20,000 waterfowl including Brent Geese, Knot, Bar-tailed Godwit, Shelduck, Wigeon, Teal, Pintail, Shoveler, Oystercatcher, Ringed Plover, Golden plover, Grey Plover, Sanderling, Dunlin, Black-tailed Godwit, Curlew, Turnstone and Redshank. Some of these species frequent South Dublin Bay and the River Tolka Estuary for feeding and/or roosting purposes (mostly Brent Goose, Oystercatcher, Ringed Plover, Sanderling and Dunlin). The populations of Pintail and Knot are of particular note as they comprise more than 10% of the respective national totals.<br><br>North Bull Island SPA is a regular site for passage waders, especially Ruff, Curlew, Sandpiper and Spotted Redshank. These are mostly observed in single figures in autumn but occasionally in spring or winter. The site formerly had an important colony of Little Tern. | 1.0, 2.1-2.9, 3.1, 3.2, 4.2, 4.3, 5.1-5.6. | All. |

# Designated Sites

## Action: Raise awareness – Collation and collection of information – Protection and enhancement measures

| Habitat | Designation | National | International | Brief Description | Actions | Partners |
|---|---|---|---|---|---|---|
| North Dublin Bay | pNHA (206) | pNHA under the WA | Boundary overlaps with SPA and cSAC | As described for North Bull Island and North Bull Island above. | 1.0, 2.1-2.9, 3.1, 3.2, 4.2, 4.3, 5.1-5.6. | All |
| South Dublin Bay | pNHA (210) | pNHA under the WA | Overlaps with cSAC | As described for South Dublin Bay above. | | |
| Dolphins, Dublin Docks | pNHA (201) | pNHA under the WA | Part of the Dublin Bay IBA described above | 2 mooring 'dolphins' in the R. Liffey near Pigeon House Harbour. These 'dolphins' are used by nesting terns with approximately 350 pairs of Common tern recorded in 2006. | | |
| Royal Canal | pNHA (2103)<br>Flora Protection Order, 1999 (Opposite-leaved pondweed)<br>RDB (Green-winged orchid) | pNHA under the WA | | The designated area of the Royal Canal includes the central channel and adjoining banks, hedgerows, tow-path grassland, open water, related scrub and related woodland.<br><br>EU HD Annex II species using the canal in the city limits include Bats and Otter.<br><br>Opposite-leaved pondweed (*Groenlandia densa*) (Flora Protection Order, 1999) occurs in the canal. Green-winged orchid (*Orchis morio*) (RDB) is found along tow-path grassland. Tassel stonewort (*Tollypella intricata*), a species of national importance is found along the Dublin stretches. Kingfisher (*Alcedo atthis*), an EU BD Annex I species feeds along the canal. | | |

# Designated Sites

## Action: Raise awareness – Collation and collection of information – Protection and enhancement measures

| Habitat | Designation | National | Brief Description | Actions | Partners |
|---|---|---|---|---|---|
| Grand Canal | pNHA (2104) | pNHA under the WA | The Grand Canal is a man-made waterway linking the R. Liffey in Dublin with the R. Shannon in the west. The areas designated include the main channel and banks.<br><br>The Grand canal regularly supports 11 different bird species over winter months, with on average 450 wildfowl including Cormorant, Little grebe, Coote, Moorhen, Blackheaded gull, Tufted duck, Grey heron, Mute Swan, Mallard and Herring gull. Lesser opposite-leaved pondweed, a protected plant, is found in the Grand Canal. | 1.0, 2.1-2.9, 3.1, 3.2, 4.2, 4.3, 5.1-5.6. | All. |
| River Dodder<br>River Tolka<br>River Liffey | CA | | Species of note that occur on these waterways include bats, otter, Kingfisher, Dipper, rare and scarce plants and Brown trout.<br>Rare plants[14] that have been recorded for the River Dodder include : *Malva neglecta, Agrostemma githago, Rorippa palustris, Hypericum hircinum, Mimulus guttatus, Allium carinatum, Barbarea intermedia.*<br><br>Rare plants that have been recorded for the River Tolka include: *Diplotaxis muralis, Anemone nemorosa, Salix viminalis x S. caprea, Ranunculus aquatalis, R. tricophyllus, Cornus sericea, Carex strigosa, Spergula arvensis, Orobanche hederae, Milium efusum, Thlaspe arvense, Solanum migrum, Betula pendula, Salix fragilis var russellia* and *Sparganium emersum.*<br><br>Rare plants that have been recorded for the R. Liffey include: *Botumus umbellatus, Chara globularis, Erigeron karvinskianus, Hieracium gougetianum, Myriophyllum spicatum, Potamogeton lucens x P. perf., P. natans, P. pusillus, Sambucus ebulis, Scrophularia umbrosa, Senecio viscosus, S. vulgaris f. radiatus, Sparganium emersum* and *Vulpia myuros.* | 1.0, 2.1-2.9, 3.1, 3.2, 4.2, 4.3, 5.1-5.6. | All. |

[14] Rare plant data provided by DNFC. These records need to be re-surveyed to establish if plant still at that location.

# Invasive and pest species (plants and animals)

## Action: Raise awareness - Collation & collection of information - Eradication or management

| Common/technical name | Local | Location | Risk | Actions | Partners |
|---|---|---|---|---|---|
| Japanese knotweed (*Fallopia japonica)* | BAP | Anywhere and dominant along watercourses. | Japanese knotweed grows to about 3m high with bamboo-like stems, arching branches and creamy white flowers. The woody dead stems persist erect throughout winter and new shoots, produced from an extensive rhizome system,[15] grows up the following spring to form dense thickets. The dead stems and leaf litter decompose very slowly and form a deep organic layer thus preventing native seeds from germinating. Once present at a site, the plant increases in area rapidly and soon forms monoculture stands. It thrives on disturbance. | Removal.<br>Work with other LAs to survey and manage Japanese knotweed, Himalayan balsam and Giant hogweed at river catchment level.<br><br>Also: 1.0, 2.1-2.9, 4.1- 4.3, 5.1-5.6 | DCC, NBDC, NPWS, 3d, NBG, NGOs , LAs and HC |
| Himalayan (Indian) balsam (*Impatiens glandulifera)* | BAP | Aquatic freshwater e.g. watercourses | Spreads quickly as seeds can disperse up to 7m when seed pods burst open. Even severed stems can continue to develop seed pods. In winter when plants die back, soil is exposed which is eroded into rivers, altering substrate characteristics, providing favourable conditions for abundant aquatic plant growth and rendering the river unsuitable for salmon spawning. | | |
| Giant hogweed (*Heracleum mantegazzianum)* | BAP | Along river courses. | Can cause severe blistering and rash. | | |
| Sea Buckthorn (*Hippophae rhamnoides*) | BAP | Sand dunes mainly. | Very difficult to eliminate once established. Takes over native dune plants and thus prevents natural dune accretion. | | |
| Common Cordgrass (*Spartina anglica*) | BAP | Coastal floodplain environments e.g. mudflats | Rapid colonization over sites with large wintering population of waders and wildfowl reduces habitat availability for feeding and roosting. Alters shallow estuaries to form badly drained marshes resulting in increased flooding. | | |

[15] A thickened stem that grows below or on the soil surface.

# Invasive and pest species (plants and animals)

## Action: Raise awareness - Collation & collection of information - Eradication or management

| Common/technical name | Local | Location | Risk | Actions | Partners |
|---|---|---|---|---|---|
| Ragwort (*Senecio jacobaea)* | BAP | Anywhere | Toxic to livestock | Removal<br>Also: 1.0, 2.1-2.9, 4.1- 4.3, 5.1-5.6 | DCC, NBDC, NPWS, 3d, NBG, NGOs and HC |
| Grey Squirrel (*Sciurus carolinensis*) | BAP | Parks, gardens and woodland | Outcompetes native Red Squirrels for food resources.<br>Silent carrier of squirrel parapox virus which kills Red Squirrels.<br>Predates upon birds' nests.<br>Damages trees.<br>Becomes a nuisance to public, e.g., in Botanic Gardens. | – Survey location and density of red and grey squirrels.<br>– Identify maximum carrying capacity for grey squirrel populations in Dublin city parks.<br>– Manage grey squirrel population numbers.<br>Also: 1.0, 2.1-2.9, 4.1-4.3, 5.1-5.6 | DCC, NBDC, NPWS, 3d, NBG, NGOs, HC and Dublin Zoo. |

# 4. Measuring progress

- **STEERING GROUP MEETING ANNUALLY**
  The main purpose of the plan is to instigate and coordinate action for biodiversity. The steering group and consultees are the authors of the proposed actions in this plan and have shared responsibility for their implementation. The steering group should meet at regular intervals to review progress of the plan and consider additional work that may be required.

- **AN ANNUAL DETAILED PROGRAMME**
  The plan has been laid out over a five-year implementation period. A detailed annual work programme will be identified each year and presented to the steering group. Many actions are ambitious and will depend on sourcing funding from a wide range of sources. All stakeholders have a role to play in identifying funding and addressing the targets identified.

- **DEVELOPMENT OF BIODIVERSITY CAPACITY IN DUBLIN CITY**
  This report was prepared by the Dublin City Biodiversity Officer, working under the guidance of the steering group. There is a real need for the continuation and further support of the Biodiversity Officer's post in years ahead in order to provide a focal point for feedback from partners, to achieve wide community and other stakeholder involvement and to coordinate implementation of the actions.

- **SUPPORT FROM NATIONAL INITIATIVES**
  National support for initiatives such as native planting, awareness-raising, capital for projects and support for additional personnel and network of biodiversity officers will help create an impetus for implementing and monitoring standards and methods.

## SUSTAINABILITY

The state of biodiversity is a key measure of the degree to which development is sustainable. Declining biodiversity means that the pressures are too great and will negatively affect the capacity of ecosystems to respond to further changes. There is an ongoing problem with the concept of 'sustainable development' that needs to be addressed. It is used more often to describe whether a given activity can be or is economically viable than in its full – environmental, social and economic – sense. Sustainable development is about integration and the environment must be treated as an integral part of the socio-cultural sphere. (Photo: Mairéad Stack)

Eoghan Ó hÉighnigh (Age 12),
Scoil an tSeachtar Laoch,
Baile Munna, B.Á.C. 11.

## LET'S TAKE ACTION NOW

- More trees and plant to encourage wildlife
- Nesting boxes for bats and birds in parks and given to private homes
- To clean up dog poo, special on street sanded areas to be provided where owners can bring their dogs to do their business (e.g. Brittany)
- Enforcement of litter and dog clean up rules. Fines to be used to provide equipment needed for the biodiversity improvements
- Information packs for schools and homes on how to encourage wild life into gardens
- Cheap bird feeders to made available to anyone interested
- People encouraged to leave part of their gardens wild to have breeding grounds for insects and wild plants.
- Sponsored community cleans ups with nature as the main reason
- More advertisement about the benefit of having a clean city which would encourage more wild life
- Provide more pooper scooper dispensers and disposal bins

(Winning submission to Dublin City Biodiversity Action Plan 2008-2012 consultation from Comhairle na nÓg).

# 5. Summary of legislation relating to natural heritage

## National legislation

- **The Wildlife Act, 1976, as amended by the Wildlife (Amendment) Act, 2000.**
  This Act gives the Minister power to designate Natural Heritage Areas (NHAs). At present, most sites identified are yet to be formally designated so are proposed (pNHAs). These sites have special national significance for wildlife and habitats. Many of Ireland's wild mammals are protected and so are all bird species. The Wildlife Act also protects flora, by means of the Flora Protection Order 1999 (FPO) (SI No 94 of 1999). Sixty-nine species of vascular plants (flowering plants and ferns) and twenty-one species of lower plants (mosses, liverworts and algae) are protected currently. The Act forbids anyone from uprooting, cutting or damaging these plants or interfering with their habitats, except under licence from NPWS. The Act provides for the establishment of Nature Reserves, refuges for Fauna and Wildfowl Sanctuaries. The Act forbids the destruction of Hedgerows during the bird-nesting season from 1st March to 31st August each year. Nature Reserve (NR) status delivers the protection of flora and fauna. They are protected from damaging activities under the Wildlife Amendment Act 2000. There are 77 Nature Reserves in the country. Wildfowl Sanctuaries (WS) were initially designated under the Game Preservation Act 1930, and now under the 1976 Wildlife Act to protect certain geese, ducks and waders from hunting. A total of 68 Wildfowl Sanctuaries have been designated.

- **European Communities (Natural habitats) Regulations, 1997 (S.I. No.94 of 1997)**
  Transposes EU Habitats Directive (92/43/EEC) into Irish law. Provides protection to designated sites from the time of notification to the landowner. Amends the 1963 Planning Act by requiring Planning Authorities to request an 'appropriate assessment' of a development on a cSAC or SPA. Disallow any justification for damaging a protected site other than for H&S reasons and these must be argued and documented. Lists of activities requiring Ministerial consent (Notifiable Actions) have been created for each protected habitat.
- Whale Fisheries Act 1937
- Fisheries (Amendment) Act 1999 – Number 35 of 1999
- Salmon and Sea Trout Caught by Rod and Line (Prohibition on sale) Order 2001 – SI No 53 of 2001
- Wild Salmon and Sea Trout Tagging Scheme Regulations 2005 – SI No 204 of 2005
- Conservation of Salmon and Seat Trout Bye-law No.797 of 2004
- Harbours Acts 1996 – 2000
- Sea Pollution Acts 1991 – 1999
- The Forestry Act 1946

- **Planning and Development Acts, 2000-2002**
  Under the Planning & Development Act 2000 a Special Amenity Area Order (SAAO) designation requires that development must respect and be in accord with the "specific objectives" pertaining to the subject site. SAAOs are made for areas of outstanding beauty or areas of special recreational value, having regard to any benefits for nature conservation.

- European Communities (Environmental Impact Assessment) (Amendment) Regulations, 1999 (S.I. No 93 of 1999), and Local Government (Planning and Development) Regulations 1999 (S.I. No 431 of 1999).

## European Directives

- **Habitats Directive**
  The European Union Directive 92/43/EEC of May 1992 on the conservation of natural habitats and of wild flora and fauna (the Habitats Directive) aims to protect important habitats and rare or endangered species throughout the European Union. The Directive provides for the establishment of a coherent ecological network of protected areas across all EU member states, known together with sites designated under the Birds Directive as 'Natura 2000'. This is the EU's contribution to the Convention on Biodiversity that was ratified by Ireland in 1996. Special Areas of Conservation (SAC) are designated under the Habitats Directive.
  The designation process is ongoing and as such these sites are 'candidate' (cSACs) although their level of protection is the same as complete designation.

Habitats listed under Annex I the Directive are considered vulnerable in a European context or contribute significantly to the suite of habitats across Europe. These habitats are strictly protected. Annex II lists species that must be afforded protection. The Directive also lists species that Require Strict Protection under Annex IV. In this case the resting and breeding locations are also to be protected – bat roosts and otter holts, for example. Annex V lists species whose taking in the wild must be subject to management measures.

- **Birds Directive**
  Under the European Union Directive 79/409/EEC of April 1979 on the conservation of wild birds, Ireland must protect particularly vulnerable species included in Annex I as well as all regularly occurring migratory species especially wetland species. Ireland is obliged to protect habitats of birds that are vulnerable due to climate change or that are vulnerable due to their small population size. Ireland must also include wetland considerations within landuse planning programmes. Special Protection Areas (SPAs) are designated to help achieve this. The cSACs and SPAs together constitute the 'Natura 2000' network of sites, contribution to a network across all of Europe.
- Water Framework Directive (Council Directive 2000/60/EC)
- Freshwater Fish Directive (Council Directive 78/659/EC)
- The Strategic Environmental Assessment Directive (SEA). Require certain capital projects to complete EIAs.

The full text of Irish legislation is available at **www.irishstatutebook.ie** and **www.irlgov.ie.** EU legislation is available at **www.Europa.eu.int/eur-lex/en**.

## International Conventions and Agreements

- Convention on Biological Diversity 1992, Rio Earth Summit (www.biodiv.org) European Landscape Convention 2000 (www.conventions.coe.int)
- Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention) 1979 (www.conventions.coe.int)
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) 1979 (www.cms.int)
- Convention on Wetlands of International Importance (Ramsar Convention) 1971 (www.ramsar.org)
  The Ramsar list is a list of wetlands of international importance designated to promote the conservation and wise use of these wetlands for their waterbirds. The Irish government signed up to this convention in 1971, it is a voluntary inter-governmental treaty.
- Convention on International Trade in Endangered Species (CITES) 1973 (www.cites.org)
- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention) 1992 (www.ospar.org)
- Agreement on the Conservation of Bats in Europe (Bonn Convention) 1993
  www.eurobats.org/documents/agreement_text.htm
- International Convention for the Regulation of Whaling 1946
  www.iwcoffice.org/commission/convention.htm
- Agreement in the Conservation of African-Eurasian Migratory Waterbirds (AEWA)(Bonn Convention) 1996
  www.ramsar.org/speech/speech_quebec_medwet.htm
- International Timber Trade Agreement 1994, signed in 1996.
- Pan-European Biological and Landscape Diversity Strategy, endorsed 1995
  www.strategyguide.org/fulltext.html
- The European Network of Biogenetic Reserves (1976) contains representative examples of the natural habitats that are especially valuable for nature conservation in Europe.
  www.ims.wcmc.org.uk/IPIECA2/conven/conven_biogen.html
- The Man and Biosphere Reserve Programme (MAB) of UNESCO (United Nations Educational, Scientific and Cultural Organisation) aims to develop a basis for the rational use and conservation of resources and the biosphere. Killarney National Park and North Bull Island in Dublin are the only two in Ireland. Their purpose is to combine conservation, education, scientific research, monitoring and to involve the local community.

**IBA**

The Important Bird Area programme of BirdLife International is a worldwide initiative aimed at identifying and protecting a network of crucial sites important for birds. There are 156 IBAs in Ireland, 122 of which regularly support wintering waterbirds. Dublin Bay is an IBA.

## THE GARDEN BIRD SURVEY

BirdWatch Ireland's most popular volunteer-based survey, the Garden Bird Survey helps us to keep track of the fortunes of Ireland's garden birds. It has been running annually since the winter of 1994/95 and attracts over 1,000 submissions each year. As the Irish countryside changes, gardens are becoming increasingly important havens for many species, and it is vital for us to know how their populations are faring. The GBS does this not only by giving us a good idea of how our garden birds themselves are doing, but also an indication of how the environment is faring in general. Blackbird. www.birdwatchireland.ie/bwi/pages092003/consvwork/surveys/gardenbs.html

*Robin in Holly tree in Bushy Park, Terenure. (Photo: Anthony Woods)*

## London Rocket: A SCARCE DUBLIN PLANT SPECIES

*Dublin Naturalists Field Club*

London Rocket (*Sisymbrium irio)* is an extremely rare plant in Dublin, its only known locality in Ireland. It is found at the base of walls, on railway lines and waste ground.

Relatively recent sighting include the Dublin 4 areas of Sandymount and Ringsend in the 1970s and 1980s, on the steps of an abandoned building in Chapelizod both in the late 1980s and again at the turn of the Millennium. It was noticed at Camden Place off Harcourt Street in 1992 and again nearby in the summer of 2006 when young plants were quite plentiful. Many of its former known sites have now been built on, 'tidied' or regularly sprayed with herbicide, yet this harassed plant continues to show a remarkable resilience under human pressure.

This annual plant grows to a height of half a metre or more and has deeply divided leaves and small yellow flowers about 5 mm across. The fruits ripen in pods 50 mm long diverging slightly from the stem. It is native to Southern Europe and North Africa and apparently initially imported to Ireland as a wool or grain alien. In London it was especially abundant after the Great Fire in 1666 and hence its common name. In Ireland, what is believed to be the first published report of this yellow crucifer was by Threlkeld (of "*Eruca sylvestris vulgatior*"), who noted it as growing on walls "between Dolphin's Barn and Cork Bridge" (1727). So after almost three centuries as part of the established flora of Dublin it can hardly still be considered as a "blow-in" from the Mediterranean. Colgan, in his Flora of the County Dublin (1904), lists many reports for the 19th century. But the plant has since seriously declined in frequency as has been noted in Flora of County Dublin (1998).

# 6. Appendices

## Appendix 1 – Existing Local and National Strategies and Plans

**National Strategies and Plans**

- National Biodiversity Plan 2002
  The National Biodiversity Plan 2002 sets out the general framework for implementing the Convention on Biological Diversity by Ireland. It includes proposed actions of both a strategic and specific nature. The plan has been subject to two reviews. A new plan is currently being developed.
  www.biodiv.org/doc/world/ie/ie-nbsap-01-p1-en.pdf
  www.biodiv.org/doc/world/ie/ie-nbsap-01-p3-en.pdf
- NPWS 'Natura 2000' protected site Management Plans
  www.npws.ie/publications/literature/conservation ManagementPlans/
- National Countryside Recreation Strategy
  www.pobail.ie/en/RuralDevelopment/file,58330, en.doc
- National Trails Strategy
  www.irishsportscouncil.ie
- Recommendations on the implementation and review of the National Biodiversity Plan. Comhar The National Sustainable Development Partnership.
  www.comhar-nsdp.ie/ComharDocs/Final_ Biodiversity_Report.pdf
- Interim review of the implementation of the National Biodiversity Plan. Dept of the Environment
  www.environ.ie/DOEI?DOEIPol.nsf/0/2b2a97f190667 25080256fof003bc850/$FILE/15394%20Biodiversity %20(low).pdf
- Sustainable Development – A Strategy for Ireland 1997
  www.environ.ie/DOEI/DOEIPol.nsf/wvNavView/ Sustainable+Development:+A+Strategy+for+Ireland? OpenDocument&Lang=
- draft All Ireland Species Action Plan – Bat Species
- All Ireland Species Action Plan – Irish Hare
  All-Ireland Action Plans are currently being prepared by National Parks and Wildlife Service for priority habitats and species. A number of these are available in draft form. www.npws.ie/en/Publications
- National Plan for Sustainable Development (1987)
- National Plant Conservation Strategy
  www.botanicgardens.ie/gspc/inspc.htm
- National Marine Policy: Conserving Ireland Maritime Heritage 2006
  www.heritagecouncil.ie/publications/marine _policy_2006/index.html

*Leisler's Bat on bark (Photo: Austin Hopkirk)*

*Juvenile newt in Dublin grassland. (Photo: Anthony Woods)*

**Local Plans**

- Dublin City Development Plan 2007 – 2011
  Conservation Areas (CA) have been identified along our main waterways in the Dublin City Development Plan 2005 – 2011.This is in recognition of their unique contribution and importance to the heritage of the city. It is policy to have regard to the effect of proposals on buildings and surroundings, both natural and man made.
- Strategic Framework Plan for Dublin Bay ( in prep.)
- Dublin City Heritage Plan 2002 – 2006
- Dodder Framework Plan (in prep 2007)
- Dublin Strategic Drainage Study
- Phibsboro/Mountjoy Framework Plan
- Ballsbridge/Ringsend Framework Plan

# Appendix 2 - Descriptions of Designated Sites

**CANDIDATE SPECIAL AREA OF CONSERVATION (cSAC)**
**SITE NAME:** SOUTH DUBLIN BAY
**SITE CODE:** 000210
This site lies south of the River Liffey and extends from the South Wall to the west pier at Dún Laoghaire. It is an intertidal site with extensive areas of sand and mudflats, a habitat listed on Annex I of the EU Habitats Directive. The sediments are predominantly sands but grade to sandy muds near the shore at Merrion gates. The main channel which drains the area is Cockle Lake.

There is a bed of Eelgrass (*Zostera noltii*) below Merrion Gates which is the largest stand on the east coast. Green algae (*Enteromorpha spp., Ulva lactuca*) are distributed throughout the area at a low density. Fucoid algae occur on the rocky shore in the Maretimo to Dún Laoghaire area. Species include *Fucus spiralis*, *F. vesiculosus*, *F. serratus*, *Ascophyllum nodosum* and *Pelvetia canaliculata*.

Lugworm (*Arenicola marina*) and Cockles (*Cerastoderma edule*) and other annelids and bivalves are frequent throughout the site. The small gastropod *Hydrobia ulvae* occurs on the muddy sands off Merrion Gates.

South Dublin Bay is largely protected as a Special Protection Area so is clearly an important site for waterfowl. See Sandymount/Tolka Estuary SPA description for further information on waterfowl.

**CANDIDATE SPECIAL AREA OF CONSERVATION (cSAC)**
**SITE NAME :** NORTH DUBLIN BAY
**SITE CODE :** 000206
This site covers the inner part of north Dublin Bay, the seaward boundary extending from the Bull Wall lighthouse across to the Martello Tower at Howth Head.
The North Bull Island is the focal point of this site. The island is a sandy spit which formed after the building of the South Wall and Bull Wall in the 18th and 19th centuries. It now extends for about 5 km in length and is up to 1 km wide in places. A well-developed and dynamic dune system stretches along the seaward side of the island. Various types of dunes occur, from fixed dune grassland to pioneer communities on foredunes. Marram Grass (*Ammophila arenaria*) is dominant on the outer dune ridges, with Lyme Grass (*Leymus arenarius*) and Sea Couchgrass (*Elymus farctus*) on the foredunes. Behind the first dune ridge, plant diversity increases with the appearance of such species as Wild Pansy (*Viola tricolor*), Kidney Vetch (*Anthyllis vulneraria*), Bird's-foot Trefoil (*Lotus corniculatus*), Rest Harrow (*Ononis repens*), Yellow Rattle (*Rhinanthus minor*) and Pyramidal Orchid (*Anacamptis pyramidalis*). In these grassy areas and slacks, the scarce Bee Orchid (*Ophrys apifera*) occurs.

About 1 km from the tip of the island, a large dune slack with a rich flora occurs, usually referred to as the 'Alder Marsh' because of the presence of Alder trees (*Alnus* spp). The water table is very near the surface and is only slightly brackish. Saltmarsh Rush (*Juncus maritimus*) is the dominant species, with Meadow Sweet (*Filipendula ulmaria*) and Devil's-bit (*Succisa pratensis*) being frequent. The orchid flora is notable and includes Marsh Helleborine (*Epipactis palustris*), Common Twayblade (*Listera ovata*), Autumn Lady's-tresses (*Spiranthes spiralis*) and Marsh orchids (*Dactylorhiza* spp.)

Saltmarsh extends along the length of the landward side of the island. The edge of the marsh is marked by an eroding edge which varies from 20 cm to 60 cm high. The marsh can be zoned into different levels according to the vegetation types present. On the lower marsh, Glasswort (*Salicornia europaea*), Saltmarsh Grass (*Puccinellia maritima*), Annual Sea-blite (*Suaeda maritima*) and Greater Sea-spurrey (*Spergularia media*) are the main species. Higher up in the middle marsh Sea Plantain (*Plantago maritima*), Sea Aster (*Aster trifolium*), Sea Arrowgrass (*Triglochin maritima*) and Sea Pink (*Armeria maritima)* appear. Above the mark of the normal high tide, species such as Scurvy Grass (*Cochlearia officinalis*) and Sea Milkwort (*Glaux maritima*) are found, while on the extreme upper marsh, Sea Rushes are dominant. Towards the tip of the island, the saltmarsh grades naturally into fixed dune vegetation.

The island shelters two intertidal lagoons which are divided by a solid causeway. The sediments of the lagoons are mainly sands with a small and varying mixture of silt and clay. The north lagoon has an area known as the "Salicornia flat", which is dominated by *Salicornia dolichostachya*, a pioneer Glasswort species, and covers about 25 ha. Tassel Weed (*Ruppia maritima*) occurs in this area, along with some Eelgrass (*Zostera angustifolia)*. Eelgrass also occurs in Sutton Creek. Cordgrass (*Spartina anglica*) occurs in places but its growth is controlled by management. Green algal mats cover large areas of the flats during summer. These sediments have a rich macrofauna, with high densities of Lugworms in parts of the north lagoon. Mussels (*Mytilus edulis*) occur in places, along with bivalves such as *Cerastoderma edule, Macoma balthica* and *Scrobicularia plana*. The small gastropod *Hydrobia ulvae* occurs in high densities in places, while the crustaceans *Corophium volutator* and *Carcinus maenas* are common. The sediments on the seaward side of North Bull Island are mostly sands. The site extends below the low spring tide mark to include an area of the sublittoral zone.

Three Rare plant species legally protected under the Flora Protection Order 1999 have been recorded on the North Bull Island. These are Lesser Centaury (*Centaurium pulchellum*), Hemp Nettle (*Galeopsis angustifolia*) and Meadow Saxifrage (*Saxifraga granulata*). Two further species listed as threatened in the Red Data Book, Wild Sage (*Salvia verbenaca*) and Spring Vetch (*Vicia lathyroides*), have also been recorded. A rare liverwort, *Petalophyllum ralfsii,* was first recorded from the North Bull Island in 1874 and has recently been confirmed as being still present there. This species is of high conservation value as it is listed on Annex II of the EU Habitats Directive. The North Bull is the only known extant site for the species in Ireland away from the western seaboard.

North Dublin Bay is of international importance for waterfowl. During the 1994/95 to 1996/97 period the following species occurred in internationally important numbers (figures are average maxima): Brent Geese 2,333; Knot 4,423; Bar-tailed Godwit 1,586. A further 14 species occurred in nationally important concentrations; Shelduck 1505; Wigeon 1,166; Teal 1,512; Pintail 334; Shoveler 239; Oystercatcher 2,190; Ringed Plover 346; Grey Plover 816; Sanderling 357; Dunlin 6,238; Black-tailed Godwit 156; Curlew 1,193; Turnstone 197 and Redshank 1,175. Some of these species frequent South Dublin Bay and the River Tolka Estuary for feeding and/or roosting purposes (mostly Brent Goose, Oystercatcher, Ringed Plover, Sanderling and Dunlin).

The tip of the North Bull Island was a traditional nesting site for Little Tern. A high total of 88 pairs nested in 1987. However, nesting attempts have not been successful since the early 1990s. Ringed Plover, Shelduck, Mallard, Skylark, Meadow Pipit and Stonechat also nest. A well-known population of Irish Hare is resident on the island.

The invertebrates of the North Bull Island have been studied and the island has been shown to contain at least seven species of regional or national importance in Ireland (Orders Diptera, Hymenoptera, Hemiptera).

The main landuses of this site are amenity activities and nature conservation. The North Bull Island is the main recreational beach in Co Dublin and is used throughout the year. Much of the land surface of the island is taken up by two golf courses. Two separate Statutory Nature Reserves cover much of the island east of the Bull Wall and the surrrounding intertidal flats. The site is used regularly for educational purposes. North Bull Island has been designated a Special Protection Area under the EU Birds Directive and it is also a statutory Wildfowl Sanctuary, a Ramsar Convention site, a Biogenetic Reserve, a Biosphere Reserve and a Special Area Amenity Order site.

This site is an excellent example of a coastal site with all the main habitats represented. It has good examples of 7 habitats that are listed on Annex I of the EU Habitats Directive; one of these is listed with priority status. Several of the wintering bird species have populations of international importance, while some of the invertebrates are of national importance. The site contains a numbers of rare and scarce plants including some which are legally protected. Its proximity to the capital city makes North Dublin Bay an excellent site for educational studies and research.

**SPECIAL PROTECTION AREA (SPA)**
**SITE NAME:** North Bull Island SPA
**SITE CODE:** 004006
This site covers all of the inner part of north Dublin Bay, with the seaward boundary extending from the Bull Wall lighthouse across to Drumleck Point at Howth Head. The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th centuries. It is almost 5 km long and 1 km wide and runs parallel to the coast between Clontarf and Sutton. Part of the interior of the island has been converted to golf courses. The SPA boundary overlaps with North Dublin Bay cSAC. Please see cSAC description for habitat information.

The North Bull Island SPA is of international importance for waterfowl on the basis that it regularly supports in excess of 20,000 waterfowl. It also qualifies for international importance as the numbers of two species exceed the international threshold: Brent Goose (1,548) and Bar-tailed Godwit (1,529) (all waterfowl figures given are average maxima for the five winters 1995/96 to 1999/00). The site is the top site in the country for both of these species. A further 15 species have populations of national importance: Shelduck (1,259), Teal (953), Pintail (233), Shoveler (141), Oystercatcher (1,784), Ringed Plover (129), Golden Plover (1,681), Grey Plover (51), Knot (2,623), Sanderling (141), Dunlin (3,926), Black-tailed Godwit (367), Curlew (937), Redshank (1,431) and Turnstone (157). The populations of Pintail and Knot are of particular note as they comprise more than 10% of the respective national totals. Species such as Grey Heron, Cormorant, Wigeon, Goldeneye, Red-breasted Merganser and Greenshank are regular in winter in numbers of regional or local importance. Gulls are a feature of the site during winter, especially Black-headed Gull (2,196) and Common Gull (332). While some of the birds also frequent South Dublin Bay and the River Tolka Estuary for feeding and/or roosting purposes, the majority remain within the site for much of the winter. The wintering bird populations have been monitored more or less continuously since the late 1960s and the site is now surveyed each winter as part of the larger Dublin Bay complex.
The North Bull Island SPA is a regular site for passage waders, especially Ruff, Curlew Sandpiper and Spotted Redshank. These are mostly observed in single figures in autumn but occasionally in spring or winter.
The site formerly had an important colony of Little Tern but breeding has not occurred in recent years. Several pairs of Ringed Plover breed, along with Shelduck in some years. Breeding passerines include Skylark, Meadow Pipit, Stonechat and Reed Bunting. The island is a regular wintering site for Short-eared Owl, with up to 5 present in some winters.

The North Bull Island SPA is an excellent example of an estuarine complex and is one the top sites in Ireland for wintering waterfowl. It is of international importance on account of both the total number of waterfowl and the individual populations of Brent Goose and Bar-tailed Godwit that use it. Also of significance is the regular presence of several species listed on Annex I of the EU Birds Directive, notably Golden Plover and Bar-tailed Godwit but also Ruff and Short-eared Owl.

**SPECIAL PROTECTION AREA (SPA)**
**SITE NAME:** SANDYMOUNT STRAND/TOLKA ESTUARY SPA
**SITE CODE:** 004024
This site comprises a substantial part of Dublin Bay. It includes virtually all of the intertidal area in the south bay, as well as much of the estuary of the River Tolka to the north of the River Liffey. A portion of the shallow marine waters of the bay is also included.

*Shore crab on South Dublin Bay sand flat. (Photo: Anthony Woods)*

In the south bay, the intertidal flats extend for almost 3 km at their widest. The sediments are predominantly well-aerated sands. Several permanent channels exist, the largest being Cockle Lake. A small sandy beach occurs at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. The landward boundary is now almost entirely artificially embanked. There is a bed of Dwarf Eelgrass below Merrion Gates which is the largest stand on the east coast. Green algae are distributed throughout the area at a low density. The macro-invertebrate fauna is well-developed, and is characterised by annelids such as Lugworm, *Nephthys* spp. and Sand Mason (*Lanice conchilega*), and bivalves, especially Cockle and Baltic Tellin (*Macoma balthica*). The small gastropod Spire Shell (*Hydrobia ulvae*) occurs on the muddy sands off Merrion Gates, along with the crustacean Corophium volutator. Sediments in the Tolka Estuary vary from soft thixotrophic muds with a high organic content in the inner estuary to exposed, well-aerated sands off the Bull Wall.

The site is an important site for wintering waterfowl, being an integral part of the internationally important Dublin Bay complex. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend most of their time there. An internationally important population of Brent Goose (368) occurs regularly and newly arrived birds in the autumn feed on the eelgrass bed at Merrion. The site supports nationally important numbers of a further six species: Oystercatcher (1,145), Ringed Plover (161), Knot (548), Sanderling (321), Dunlin (1,923) and Bar-tailed Godwit (766). Other species which occur in smaller numbers include Great Crested Grebe (21), Grey Plover (45), Curlew (127), Redshank (260) and Turnstone (52).
South Dublin Bay is an important site for wintering gulls, especially Black-headed Gull (3,040), Common Gull (330) and Herring Gull (348). It is also the premier site in Ireland for Mediterranean Gull, with up to 20 birds present at times. These occur through much of the year, but especially in late-winter/spring and again in late-summer into winter. The south bay is an important tern roost in the autumn (mostly late July to September). Birds also use the Dalkey Islands to the south. The origin of many of the birds is likely to be the Dublin breeding sites (Rockabill, Dublin docks) though numbers suggest that the site is also used by birds from other sites, perhaps outside the state. More than 5,000 terns have been recorded: Common Tern (usually 2,000-3,000), Arctic Tern (usually 1,000-2,000) and Roseate Tern (usually 200-500).

The wintering birds within this site are now well-monitored. More survey, however, is required on the wintering gulls and the autumn terns.
The main threat to this site is further reclamation for industrial and/or infra-structural purposes. The intertidal areas receive water that is somewhat polluted though there are no apparent impacts on the associated flora and fauna. Owing to its location in Dublin Bay, pollution such as oil spillages from Dublin Port and shipping is a threat. Commercial bait digging may be a problem - this causes disturbance to wintering birds. Disturbance to birds is also caused by walkers and dogs.

Sandymount Strand/Tolka Estuary SPA is of high ornithological importance, being of international importance for Brent Goose and of national importance for six waterfowl species. As an autumn tern roost, it is also classified as of international importance. All of the tern species using the site are listed on Annex I of the EU Birds Directive, as are Bar-tailed Godwit and Mediterranean Gull.

## Antisocial behaviour – litter, drink and drug abuse

Items discarded by fly tipping and by random littering - such as bags, containers, beer-can rings and fishing line can cause problems for mammals and birds in any environment. Plastic and tin cans are particularly damaging as they are not biodegradable and can trap and choke wildlife. Unauthorised dumping of garden waste and emptying of fish tanks can also encourage invasive plants, particularly along our waterways. These can reduce oxygen available to fish and take over bank side vegetation.

Litter, including dog faeces, is unhygienic, unsightly and is often seen as a reason to remove the shrubs or grass it gets trapped in. This results in a direct loss of biodiversity. Equally, shrubs and hedging are often not planted or are removed because of antisocial behaviour including drink and drug abuse. The removal of vegetation for this reason results in the problem moving to elsewhere, so shrubs and other vegetation in many of our parks and open spaces are being removed. Antisocial behaviour needs to be addressed and not be passed on between green spaces, compromising the quality of these greenspaces for other users. Careful design and management of public spaces can include shrubs while avoiding antisocial behaviour and creating a safe environment for the local or visiting public. (Photo: Dublin City Council)

# Appendix 3 – Breeding, wintering and migrant birds of Dublin City and Bay

| Common name | Latin name | Breeding | Wintering | Migrant | Annex I | BoCCI* | Annex | regular** or RAG |
|---|---|---|---|---|---|---|---|---|
| **WINTERING WATERBIRDS** | | | | | | | | |
| Little Grebe | *Tachybaptus ruficollis* | Y | Y | Y | | | 3 | 1 |
| Great Crested Grebe | *Podiceps cristatus* | Y | Y | Y | | Amber | 2 | 1 |
| Cormorant | *Phalacrocorax carbo* | Y | Y | Y | | Amber | 2 | 1 |
| Grey Heron | *Ardea cinerea* | Y | Y | Y | | | 3 | 1 |
| Little Egret | *Egretta garzetta* | Y | Y | Y | Y | Amber | 1 | 1 |
| Light-bellied Brent Goose | *Branta branta hrota* | | Y | Y | | Amber | 2 | 1 |
| Shelduck | *Tadorna tadorna* | Y | Y | Y | | Amber | 2 | 1 |
| Wigeon | *Anas penelope* | | Y | Y | | Amber | 2 | 1 |
| Teal | *Anas crecca* | Y | Y | Y | | Amber | 2 | 1 |
| Mallard | *Anas platyrhynchos* | Y | Y | Y | | | 3 | 1 |
| Pintail | *Anas acuta* | | Y | Y | | Amber | 2 | 1 |
| Shoveler | *Anas clypeata* | Y | Y | Y | | | 3 | 1 |
| Tufted Duck | *Aythya fuligula* | Y | Y | Y | | Amber | 2 | 1 |
| Goldeneye | *Bucephala clangula* | | Y | Y | | Amber | 2 | 1 |
| Red-breasted Merganser | *Mergus serrator* | Y | Y | Y | | Amber | 2 | 1 |
| Moorhen | *Gallinula chloropus* | Y | Y | Y | | | 3 | 1 |

| Common name | Latin name | Breeding | Wintering | Migrant | Annex I | BoCCI* | Annex | regular** or RAG |
|---|---|---|---|---|---|---|---|---|
| Water Rail | *Rallus aquaticus* | Y | Y | Y | | Amber | 2 | 1 |
| Oystercatcher | *Haematopus ostralegus* | Y | Y | Y | | | 3 | 1 |
| Ringed Plover | *Charadrius hiaticula* | Y | Y | Y | | | 3 | 1 |
| Golden Plover | *Pluvialis apricaria* | Y | Y | Y | Y | Amber | 1 | 1 |
| Grey Plover | *Pluvialis squatarola* | | Y | Y | | Amber | 2 | 1 |
| Lapwing | *Vanellus vanellus* | Y | Y | Y | | Red | 2 | 1 |
| Knot | *Calidris canutus* | | Y | Y | | Amber | 2 | 1 |
| Sanderling | *Calidris alba* | | Y | Y | | | 3 | 1 |
| Purple Sandpiper | *Calidris maritima* | | Y | Y | | | 3 | 1 |
| Dunlin | *Calidris alpina* | Y | Y | Y | Y (breeding population) | Amber | 1 | 1 |
| Snipe | *Gallinago gallinago* | Y | Y | Y | | Amber | 2 | 1 |
| Black-tailed Godwit | *Limosa limosa* | | Y | Y | | Amber | 2 | 1 |
| Bar-tailed Godwit | *Limosa lapponica* | | Y | Y | Y | Amber | 1 | 1 |
| Whimbrel | *Numenius phaeopus* | | | Y | | | 3 | 1 |
| Curlew | *Numenius arquata* | Y | Y | Y | | Red | 2 | 1 |
| Redshank | *Tringa totanus* | Y | Y | Y | | Amber | 2 | 1 |
| Greenshank | *Tringa nebularia* | | Y | Y | | | 3 | 1 |
| Turnstone | *Arenaria interpres* | | Y | Y | | | 3 | 1 |
| Mediterranean Gull | *Larus melanocephalus* | Y | Y | Y | Y | Amber | 1 | 1 |
| Black-headed Gull | *Larus ridibundus* | Y | Y | Y | | Amber | 2 | 1 |

| Common name | Latin name | Breeding | Wintering | Migrant | Annex I | BoCCI* | Annex | regular** or RAG |
|---|---|---|---|---|---|---|---|---|
| Common Gull | *Larus canus* | Y | Y | Y | | Amber | 2 | 1 |
| Herring Gull | *Larus argentatus* | Y | Y | Y | | | 3 | 1 |
| Lesser Black-backed Gull | *Larus fuscus* | Y | Y | Y | | | 3 | 1 |
| Great Black-backed Gull | *Larus marinus* | Y | Y | Y | | | 3 | 1 |
| Little Gull | *Larus minutus* | | Y | Y | Y | Amber | 1 | 1 |

**BREEDING GULLS & TERNS**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Herring Gull | *Larus argentatus* | Y | Y | Y | | | 3 | 1 |
| Roseate Tern | *Sterna dougallii* | Y | | Y | Y | Red | 1 | 1 |
| Common Tern | *Sterna hirundo* | Y | | Y | Y | Amber | 1 | 1 |
| Arctic Tern | *Sterna paradisaea* | Y | | Y | Y | Amber | 1 | 1 |
| Kingfisher | *Alcedo atthis* | Y | Y | | Y | Amber | 1 | 1 |

**LAND BIRDS OF CONSERVATION INTEREST**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Swift | *Apus apus* | Y | | Y | | | 3 | 1 |
| Skylark | *Alauda arvensis* | Y | Y | Y | | Amber | 2 | 1 |
| Sand Martin | *Riparia riparia* | Y | | Y | | Amber | 2 | 1 |
| Swallow | *Hirundo rustica* | Y | | Y | | Amber | 2 | 1 |
| House Martin | *Delichon urbica* | Y | | Y | | | 3 | 1 |
| Stonechat | *Saxicola torquata* | Y | Y | | | Amber | 2 | 1 |

| Common name | Latin name | Breeding | Wintering | Migrant | Annex I | BoCCI* | Annex | regular** or RAG |
|---|---|---|---|---|---|---|---|---|
| Wheatear | *Oenanthe oenanthe* | Y | | Y | | | 3 | 1 |
| Redwing | *Turdus iliacus* | | Y | Y | | | 3 | 1 |
| Grasshopper Warbler | *Locustella naevia* | Y | | Y | | Amber | 2 | 1 |
| Sedge Warbler | *Acrocephalus schoenobaenus* | Y | | Y | | | 3 | 1 |
| Whitethroat | *Sylvia communis* | Y | | Y | | | 3 | 1 |
| Blackcap | *Sylvia atricapilla* | Y | Y | Y | | | 3 | 1 |
| Chiffchaff | *Phylloscopus collybita* | Y | Y | Y | | | 3 | 1 |
| Willow Warbler | *Phylloscopus trochilus* | Y | | Y | | | 3 | 1 |
| Spotted Flycatcher | *Muscicapa striata* | Y | | Y | | Amber | 2 | 1 |
| Starling | *Sturnus vulgaris* | Y | Y | Y | | | 3 | 1 |
| Chaffinch | *Fringilla coelebs* | Y | Y | Y | | | 3 | 1 |
| Siskin | *Carduelis spinus* | Y | Y | Y | | | 3 | 1 |

* Red / Amber / Green: See BoCCI definition on page 24.
** Regularly occuring species in the Dublin City Area

# Appendix 4 - Priority Vascular Plants

(FPO = Flora Protection Order under Section 21 of the Wildlife Act; CR = critical; EN = endangered; VU = vulnerable; LC = lesser concern; PROP = proposed)

## High Priority Species for Dublin city (excl. Bull Island)

| Latin name | Common name | Status |
|---|---|---|
| *Butomus umbellatus* | Flowering rush | |
| *Carlina vulgaris* | Carline thistle | |
| *Ceratophyllum demersum* | Rigid hornwort | |
| *Epipactis helleborine* | Broad-leaved helleborine | |
| *Equisetum variegatum* | Variegated horsetail | |
| *Groenlandia densa* | Opposite-leaved pondweed | FPO 1999, RDB EN |
| *Hieracium diaphanum* | Hawkweed spp. | |
| *Hieracium gougetianum* | Hawkweed spp. | |
| *Hypericum hirsutum* | Hairy St John's-wort | FPO 1999, RDB EN |
| *Kickxia elatine* | Sharped-leaved fluellen | FPO 1999, RDB EN |
| *Lamiastrum galeobdolon* | Yellow archangel | RDB VU |
| *Lathraea squamaria* | Toothwort | |
| *Lithospermum officinale* | Common gromwell | RDB prop |
| Potamogeton x salicifolius | a pondweed | |
| *Potamogeton x zizii* | a pondweed | |
| *Ranunculus circinatus* | Fan-leaved water-crowfoot | |
| *Ranunculus lingua* | Greater spearwort | |
| *Sagittaria sagittifolia* | Arrowhead | |
| *Sanguisorba minor* | Salad burnet | |
| *Scrophularia umbrosa* | Green figwort | RDB (EN) |
| *Sisymbrium irio* | London rocket | |
| *Spiranthes spiralis* | Autumn lady's-tresses | RDB prop |
| *Stellaria pallida* | Lesser chickweed | RDB prop |
| *Tolypella intricata* | Tassel stonewort | |
| *Trifolium micranthum* | Slender trefoil | |
| *Viola hirta* | Hairy violet | |
| *Zostera noltii* | Dwarf eelgrass | |

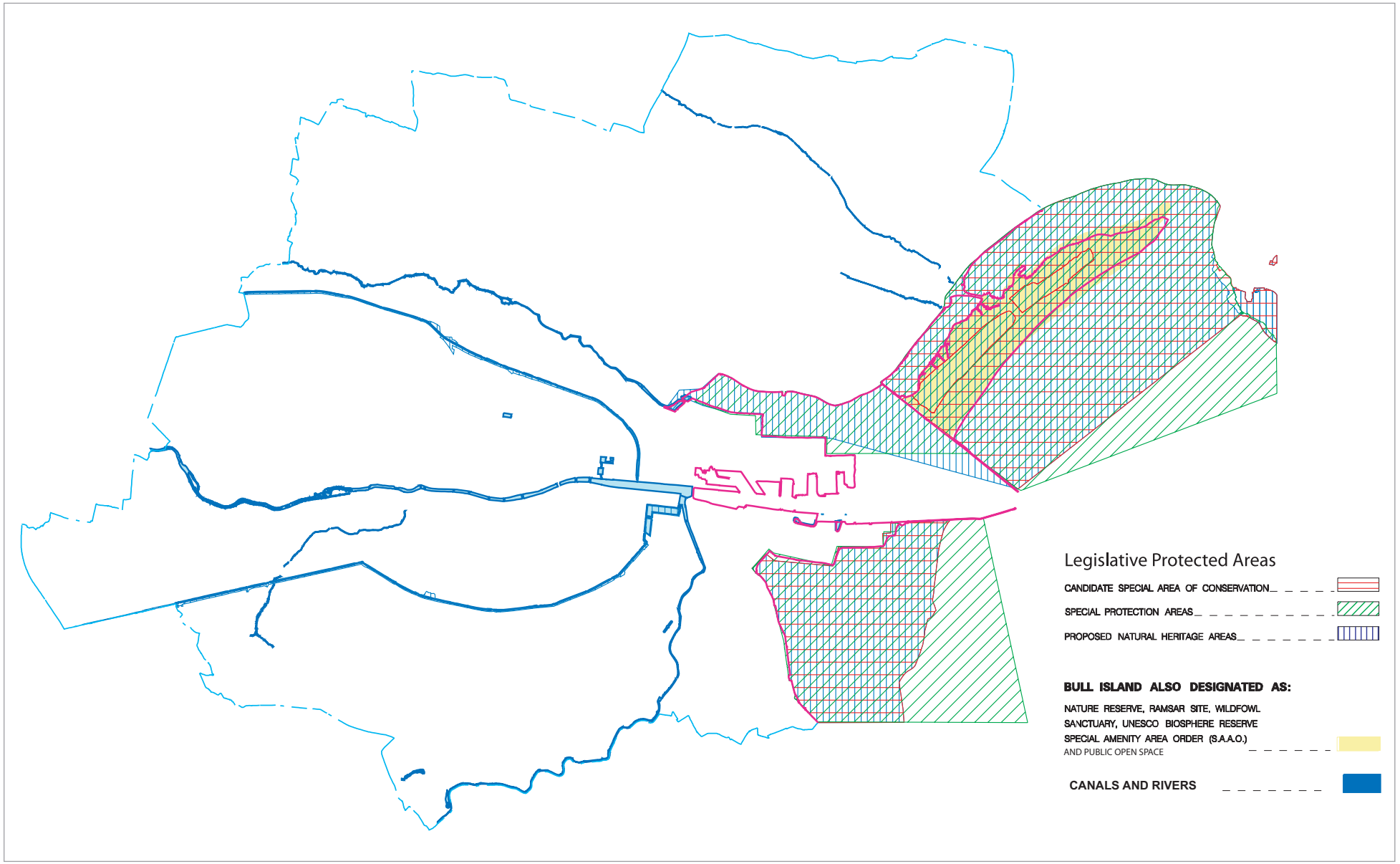
## High Priority Species for Bull Island

| Latin name | Common name | Status |
|---|---|---|
| *Blysmus rufus* | Salt-marsh Flat Sedge | |
| *Calystegia soldanella* | Sea Bindweed | |
| *Centaurium pulchellum* | Lesser Centaury | FPO 1999, WA (21) |
| *Cerastium arvense* | Field mouse ear | |
| *Dactylorhiza purpurella* | Northern Marsh Orchid | |
| *Epipactis palustris* | Marsh Helleborine | RDB LC |
| *Equisetum variegatum* | Variegated Horsetail | |
| *Galeopsis angustifolia* | Hemp nettle | FPO 1999, WA (21) |
| *Gentianella amarella* | Autumn Gentian | RDB prop |
| *Gentianella campestris* | Field Gentian | RDB prop |
| *Juncus acutus* | Sharp rush | |
| *Ophioglossum vulgatum* | Southern Adder's tongue | |
| *Ophrys apifera* | Bee Orchid | |
| *Ruppia maritima* | Tassel-weed | |
| *Salvia verbenaca* | Wild Clary | RDB VU |
| *Saxifraga granulata* | Meadow saxifrage | FPO 1999, WA (21) RDB CR |
| *Trifolium scabrum* | Rough Clover | RDB LC |
| *Trifolium striatum* | Knotted Clover | RDB LC |
| *Vicia lathyroides* | Spring Vetch | RDB VU |
| *Vulpia fasciculata* | Dune Fescue | RDB VU |
| *Zostera angustifolia* | Eelgrass | |

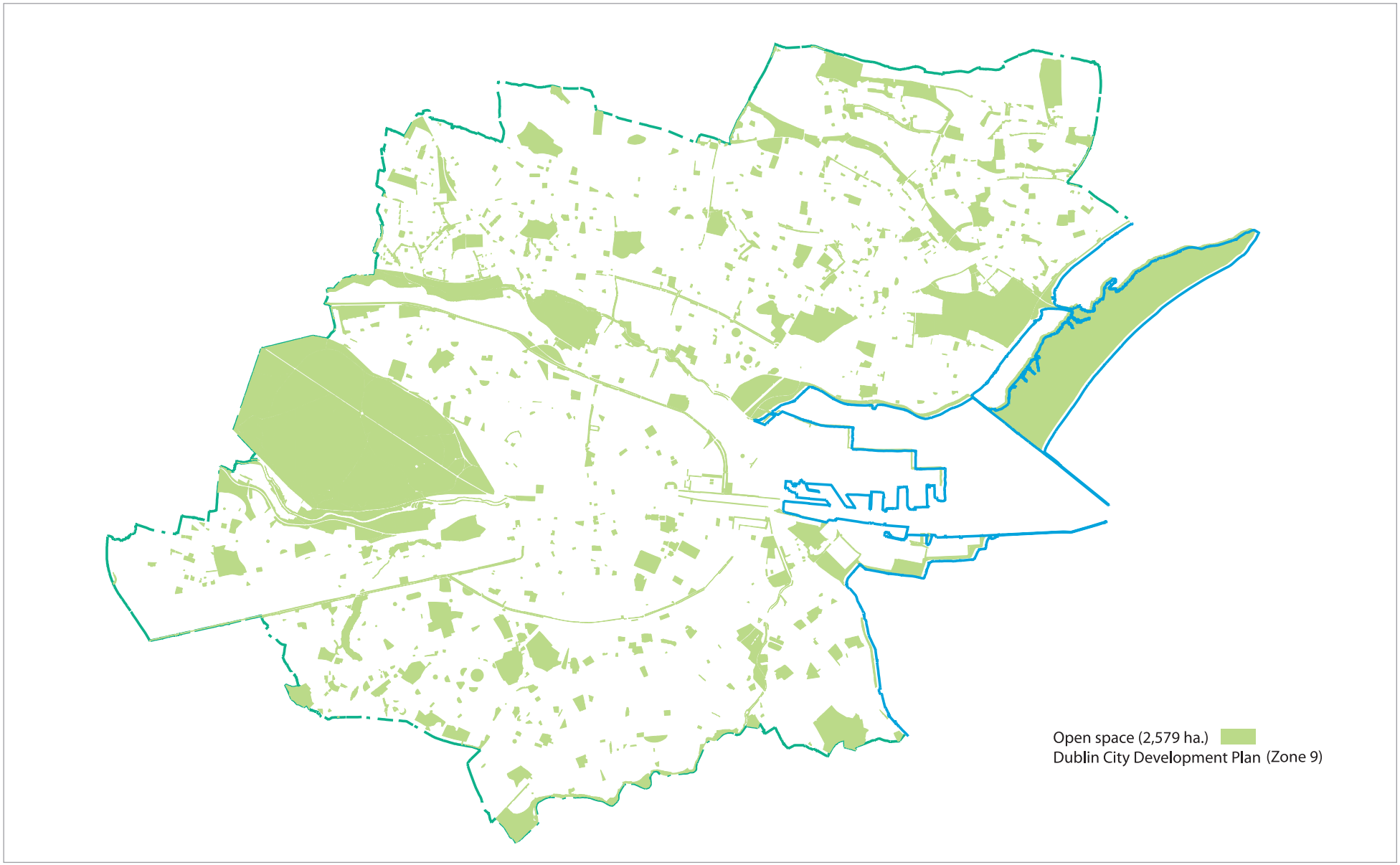
**RDB**

*The Red Data Book is a European-wide aproach to identifying rare and threatened species and lists of species whose continued existence is threatened. Species are classified into different categories of perceived risk. The Irish series also gives information on species considered under threat in the context of Europe.*

## Appendix 5: Map of designated areas and waterways in Dublin City Council Area



## Appendix 6: Map of open spaces in Dublin City Council Area



# 8. Acknowledgments

**Consultation contributors**
Many representations were made by individuals, community groups, societies and organisations during the public consultation periods which invited comments on the production and content of the plan.

Photographs by Anthony Woods, Nigel Motyer, DCC Parks and Landscape Services and steering group members.

Facilitated workshops run by Aoife Cassidy and Associates.

*Hedgehog in Raheny garden. (Photo: Anthony Woods)*

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Catherine McCabe, Dublin Chamber of Commerse
Donncha Ó Dúlaing / Charles Duggan, Heritage, Dublin City Council
Jim Keogan/Una Bagnal, Planning, Dublin City Council
Gerry Barry, Parks and Landscape Services, Dublin City Council
Mary Hanlon / Linda MacDonald, Community Development, Dublin City Council
Tom Leahy, Engineering, Dublin City Council
Tom Gorman, Environment and Culture, Dublin City Council
Martin Kavanagh, Development, Dublin City Council
Mairéad Stack, Biodiversity Officer, Dublin City Council
Siobhán Egan, former Biodiversity Officer, Dublin City Council.

*Kestrel on Crumlin lamp post. (Photo: Anthony Woods)*