

Section 8: Flora & Fauna

8.1 INTRODUCTION

This section of the EIS has been prepared by Dr Niamh Roche MIEEM. The objective of the survey is to assess the significance of the flora and fauna on the site proposed for development at O'Devaney Gardens, Stoneybatter, Dublin. Various legal instruments such as The Wildlife Acts (1976 and 2000) and the Flora Protection Order (1999) provide protection for species of National conservation importance. Proposed Natural Heritage Areas (pNHA) are conservation designated areas that protect species and habitats of regional and national importance. The EU Habitats Directive (1992) and the EU Birds Directive (1979) oblige member states to protect species and habitats that are of importance on a Europe-wide scale. Annex I and II of the Habitats Directive and Annex I of the Birds Directive list species and habitats that are of greatest conservation importance on an EU-wide scale and for which conservation areas must be designated. These designations are: Special Protection Areas (SPA) for Birds listed in Annex I of the Birds Directive; and Special Areas of Conservation (SAC) for habitats listed in Annex I of the Habitats Directive and species listed in Annex II. Some of these habitats or species are prioritised for conservation measures (* Priority Species or Habitats). A number of other Annexes in both Directives list species that require strict protection but not necessarily conservation designated areas. Ireland is also signatory to a number of conservation-related agreements and conventions such as the Bern and Bonn Conventions.

An Appropriate Assessment Screening of the masterplan has been carried out by Dublin City Council with respect to the Natura 2000 network of designated sites that could potentially be impacted by the proposed development at this location. This is attached as Appendix 1.4 of the EIS.

8.2 METHODOLOGY

On two days in June and July 2009 and one evening in August 2009, flora and fauna surveys were carried out at a site proposed for development at O'Devaney Gardens, Stoneybatter, Dublin. Weather during the surveys was mild and occasionally overcast.

8.2.1 Assessment of Flora and Habitats

The site was walked systematically while noting plant species and habitat types. All vascular plants observed during the survey were identified to species level. Nomenclature of vascular plants follows Stace (2001). Habitat types were assigned to categories (and given codes) according to the Heritage Council classification system (Fossitt 2000). Habitat types were mapped (see Figure 8.1).

Information on sites of conservation importance (National Parks and Wildlife Service, web-based map viewer) for County Dublin, and various texts such as the Irish Red Data Book for vascular plants (Curtis and McGough, 1988), Preston *et al.* (2002), the Dublin City Biodiversity Action Plan (Anon, 2008) and the Dublin City Development Plan 2005-2011 (Anon, 2005) were examined. The mapping service of the National Parks and Wildlife Service

was checked regarding known records of rarities for the area. The NPWS also commented on the project at the scoping stage.

8.2.2 Assessment of Fauna

The site was walked systematically and bird species were noted whenever sighted or identified according to song. Signs of mammal activity were also recorded. Signs of mammal activity include tracks and footprints, discarded prey items, scats and burrows or other resting places.

An evening bat survey was carried out. This survey was carried out to determine whether bats forage over the site proposed for redevelopment. Bats shout using high pitched (ultrasonic) squeaks and listen for echoes bouncing off insect prey and obstacles. This is called echolocation. Bat detectors pick up the ultrasonic calls made by bats and convert them into a sound audible to human hearing. A Stag Electronics heterodyne bat detector (Bat Box III) was used during the survey evening and was tuned to various frequencies from 45-55kHz. This detector was used in tandem with another detector tuned to 25kHz (Eco-Tranquility, Courtpan Electronics) to maximise the potential of recording bats in flight.

Information on sites of conservation importance for County Dublin (National Parks and Wildlife Service, various dates), various texts such as the Irish Red Data Book for vertebrates (Marnell *et al.*, 2009), the Dublin City Development Plan 2005-2011 (Anon, 2005), and websites including the Butterfly Ireland website of the Dublin Naturalists' Field Club and information from Bat Conservation Ireland were consulted during the report writing stage. The mapping service of the National Parks and Wildlife Service was checked regarding known records of rarities for the area. The NPWS also commented on the project at the scoping stage.

8.2.3 Assessment Limitations

The above survey was carried out during a good time of year to identify plant and faunal species. Early flowering plants (e.g. vernal species such as bluebells, or early summer flowering plants such as some orchids) or winter migrant birds will be missed during a summer survey.

8.3 THE BASELINE ENVIRONMENT

8.3.1 Context

The site proposed for development is situated on gently sloping, south facing ground on the north side of the Liffey Valley. The O'Devaney Gardens site consists of amenity grassland, built land, waste ground and scrub.

The area is bounded by built land and roads in all directions excepting the eastern boundary which constitutes the landscaped grounds of St Bricin's Military Hospital.

There are no protected sites of conservation importance located within, adjacent or close to O'Devaney Gardens. O'Devaney Gardens is situated approximately at an equidistance, 2km, from the Royal Canal proposed Natural Heritage Area (site code 2103) to the north, and the Grand Canal

pNHA (site code 2104), to the south. Both pNHAs consist of the canals and their banks. Both are linear conservation designations with a variety of habitats such as calcareous grassland, reed fringe, scrub and hedgerow, along with some rare aquatic plant species and some Annex I protected species such as otters. Both canals are particularly important as linking features allowing dispersal of wildlife through agricultural and urban areas. There are no features linking the O'Devaney Gardens site to either of these two closest pNHAs.

No rare plants are noted for the 10km square in which the proposed redevelopment site is situated, according to the rare plants database records supplied by the NPWS.

The Phoenix Park is situated less than 500m to the west of the present site. This park is not covered by any nature conservation designations but it is the city's largest green space with large numbers of mature trees and considerable areas of semi-natural grassland. Numerous bird species including five red listed species, have been recorded breeding and foraging in the park. Various native wild mammal species including some of Ireland's less common bats (whiskered and Natterer's) and twenty badger setts have also been recorded there. The rare and protected plants: hairy St. John's wort (*Hypericum hirsutum*) and hairy violet (*Viola hirta*), are found in the Phoenix Park.

A number of flat complexes have been demolished within the O'Devaney Gardens site in the past few years, and the demolition areas have been seeded with biodiverse meadow mixtures that include grasses and native and non-native flowering plants.

The Liffey at Islandbridge and the City Centre is estuarine in character and achieves intermediate quality status (www.epa.ie). The Liffey is also a salmonid river with a proposed Natural Heritage Area (pNHA) designation (site code 128) located further upstream at Chapelizod and beyond.

To the east of the site there are two highly protected conservation designation sites. These include North Bull Island SPA (site code 4006 see its site synopsis in the Appendix), the western boundary of which is situated 4.5km north east of the Dominic Street site. This SPA has been designated for a number of Annex I protected bird species including Golden Plover, Bar-tailed Godwit, Ruff and Short-eared Owl. Other bird species that occur there include Light-bellied Brent Goose, Shelduck, Teal, Pintail, Shoveler, Oystercatcher, Ringed Plover, and Grey Plover, Turnstone and Black-headed Gull, to name but a few. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds.

An additional protected site, North Dublin Bay SAC (site code 206 see its site synopsis in the Appendix) is located approximately 7.5km east of Dominic Street. It includes Bull Island and is designated for the presence of Annex I habitats under the Habitats Directive, such as fixed coastal dunes with herbaceous vegetation (grey dunes), humid dunes and various mud flat habitats, and the Annex II plant, a rare liverwort, *Petalophyllum ralfsii*. Three rare plant species legally protected under the Flora Protection Order 1987 have been recorded on the North Bull Island. These are Lesser Centaury (*Centaureum 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. Boundaries of the SAC and SPA overlap considerably but those of the SPA are closest to the proposed development site.

To the south east of the proposed development site there are two additional protected areas South Dublin Bay/Tolka Estuary SPA (site code 4024 see its site synopsis in the Appendix) and South Dublin Bay SAC (site code 210 see its site synopsis in Appendix). The boundaries of these two designated sites overlap considerably. The SPA has been designated for the Annex I protected species; Common tern, Arctic Tern, Roseate Tern, Bar-tailed Godwit and Mediterranean Gull. The SAC has been designated for the Annex I protected habitat 'Mudflats and sandflats not covered by seawater at low tide'. The South Dublin Bay protected sites occur approximately 7km to the south east of the present proposed development.

Additional SPA and SAC designated sites are also located over 10km from the present site but they are sufficiently distant and unconnected to the present site to be highly unlikely to be impacted by the proposed development. A full review of these sites is provided in the Appropriate Assessment submitted with the current application. The AA concludes that the proposed O'Devaney Gardens redevelopment is unlikely to cause any significant impacts on these nature conservation designated areas. The location of the site in relation to SACs and SPAs is shown in the Appropriate Assessment.

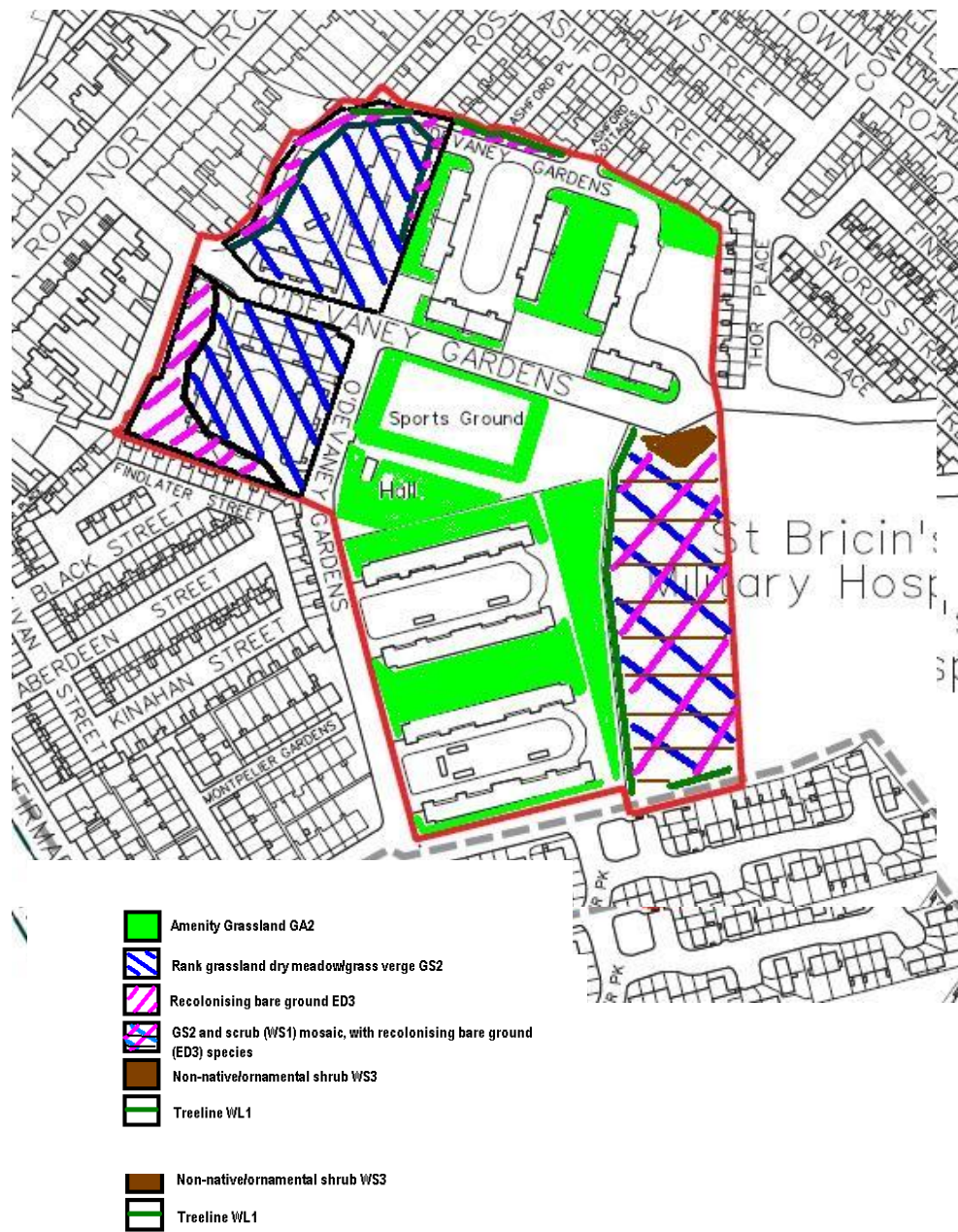
8.3.2 Character

8.3.2.1 Flora and Vegetation

The site consists of amenity grassland (GA2), dry meadow (GS2), buildings and artificial surfaces habitat (BL3), recolonising bare ground (ED3), tree lines (WL2), and a mosaic of scrub (WS1)/grassland (GS2)/recolonising bare ground (ED3).

Locations of habitat types are shown in Figure 8.1. Table 8.1 lists vascular plants found on the site.

Figure 8.1 Location of Habitat types June to August 2009.



Note that areas not coloured are categorised as Buildings and Other Surfaces (BL3).

Table 8.1: Vascular Plant Species found at the site of the Proposed Development	
SPECIES LATIN NAME	SPECIES COMMON NAME
<i>Acer pseudoplatanus</i>	Sycamore
<i>Achillea millefolium</i>	Yarrow
<i>Agrostis stolonifera</i>	Creeping bent grass
<i>Alnus cordata</i>	Italian alder
<i>Arctium minus</i>	Burdock
<i>Arrhenatherum elatius</i>	False oat-grass
<i>Bellis perennis</i>	Daisy
<i>Betula pendula</i>	Silver birch
<i>Brassica napus</i>	Rape
<i>Brassica rapa</i>	Wild turnip
<i>Buddleja davidii</i>	Buddleja
<i>Capsella bursa-pastoris</i>	Shepherd's purse
<i>Carpinus betulus</i>	Hornbeam
<i>Centaurea cyanus</i>	Cornflower*
<i>Centranthus ruber</i>	Red valerian
<i>Chenopodium album</i>	Fat hen
<i>Cirsium arvense</i>	Field thistle
<i>Cirsium vulgare</i>	Spear thistle
<i>Conium maculatum</i>	Hemlock
<i>Conyza canadensis</i>	Canadian fleabane
<i>Coronopus didymus</i>	Lesser swinecress
<i>Dactylis glomerata</i>	Cocksfoot
<i>Elymus repens</i>	Couch grass
<i>Epilobium hirsutum</i>	Hoary willowherb
<i>Epilobium montanum</i>	Broadleaved willowherb
<i>Euphorbia peplus</i>	Petty spurge
<i>Fallopia japonica</i>	Japanese knotweed
<i>Festuca pratensis</i>	Meadow fescue
<i>Fumaria muralis</i>	Common ramping fumitory
<i>Fumaria officinalis</i>	Common fumitory
<i>Galium aparine</i>	Robin-run-the-hedge
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hordeum murinum</i>	Wall barley
<i>Lamium purpureum</i>	Red deadnettle
<i>Lapsana communis</i>	Nipplewort
<i>Laurus nobilis</i>	Bay laurel
<i>Lepidium campestre</i>	Field pepperwort*
<i>Ligustrum vulgare</i>	Garden privet

<i>Linum perenne</i>	Perennial flax*
<i>Lolium perenne</i>	Perennial rye-grass
<i>Matricaria recutita</i>	Pineapple mayweed
<i>Mercurialis annua</i>	Annual mercury
<i>Paliurus spina-christi</i>	Christ's thorn
<i>Papaver rhoeas</i>	Poppy*
<i>Persicaria maculosa</i>	Redshank
<i>Phacelia tanacetifolia</i>	Lacy Phacelia
<i>Phleum pratense</i>	Timothy grass
<i>Plantago lanceolata</i>	Ribwort plantain
<i>Plantago major</i>	Broad plantain
<i>Poa annua</i>	Annual meadow grass
<i>Poa trivialis</i>	Rough meadow grass
<i>Polygonum aviculare</i>	Knotgrass
<i>Potentilla reptans</i>	Creeping cinquefoil
<i>Prunella vulgaris</i>	Self-heal*
<i>Prunus laurocerasus</i>	Cherry laurel
<i>Ranunculus repens</i>	Creeping buttercup
<i>Reseda luteola</i>	Weld
<i>Rubus fruticosus</i>	Bramble
<i>Rumex crispus</i>	Curled dock
<i>Rumex obtusifolia</i>	Broad dock
<i>Sagina procumbens</i>	Procumbent pearlwort
<i>Senecio jacobaea</i>	Ragwort
<i>Senecio vulgaris</i>	Groundsel
<i>Sisymbrium officinale</i>	Hedge mustard
<i>Sonchus asper</i>	Prickly sow-thistle
<i>Sonchus oleraceus</i>	Smooth sow thistle
<i>Stachys sylvatica</i>	Hedge woundwort
<i>Stellaria media</i>	Chickweed
<i>Taraxacum officinales agg.</i>	Dandelion
<i>Thlaspi arvense</i>	Field pennycress*
<i>Trifolium incarnatum</i>	Crimson clover
<i>Trifolium pratense</i>	Red clover
<i>Trifolium repens</i>	White clover
<i>Tripleurospermum inodorum</i>	Scentless mayweed*
<i>Tussilago farfara</i>	Coltsfoot
<i>Urtica dioica</i>	Nettle
<i>Veronica persica</i>	Common field speedwell
<i>Vicia sepium</i>	Bush vetch
<i>Vicia sativa</i>	Common vetch*

8.3.2.2 Amenity Grassland (GA2)

This grassland type is found around the flat complexes on the site and is, in places, grazed by horses. Species present include various grasses such as perennial rye grass (*Lolium perenne*) and annual meadowgrass (*Poa annua*). Broadleaved herbs include and dandelion (*Taraxacum officinale* agg.).

Amenity grassland is not listed for protection under the Habitats Directive. Locations of amenity grassland are shown in Figure 8.1. Plate 8.1 shows amenity grassland on the site.

Plate 8.1: Amenity grassland (GA1) and built land (BL3), O'Devaney Gardens



8.3.2.3 Dry Meadow (GS2)

This habitat is found in two areas of the proposed redevelopment site where flats have already been demolished. Following demolition the area was reseeded with a biodiverse meadow mixture. A number of non-native plants were included in the species mix. Among the grasses present are meadow foxtail (*Alopecurus pratensis*), timothy grass (*Phleum pratense*) and rye grass. Redshank (*Persicaria maculosa*), poppy (*Papaver rhoeas*), cornflower (*Centaurea cyanus*), self-heal (*Prunella vulgaris*), perennial flax (*Linum perenne*), scentless mayweed (*Tripleurospermum inodorum*), crimson clover (*Trifolium incarnatum*) and lacy Phacelia (*Phacelia tanacetifolia*) are among the broadleaved herbaceous species present.

This recently sown meadow is not protected under the Habitats Directive. Locations of this habitat type are shown in Figure 8.1. Plate 8.2 illustrates dry meadow habitat on the site.

Plate 8.2: Dry grassland (GS2), recently sown wildflower meadow mixture



8.3.2.4 Buildings and Artificial Surfaces (BL3)

This is the most abundant habitat type on the site. Paved areas and buildings are included in this habitat category. Relatively few plant species are found here, excepting occasional prostrate annuals such as procumbent pearlwort (*Sagina procumbens*), knotweed (*Polygonum aviculare*) and pineapple mayweed (*Matricaria recutita*).

Buildings and artificial surfaces habitat is not listed in the Habitats Directive. Figure 8.1 indicates locations of built land on the site. Plates 8.1 shows this habitat type.

8.3.2.5 Recolonising bare ground (ED3)

This habitat occurs in small areas around the site where land has been cleared with herbicide but has been recolonised with various species. Among the plants present in this habitat are several species typical to wasteground in Dublin such as wall barley (*Hordeum murinum*), annual mercury (*Mercurialis annua*), petty sprurge (*Euphorbia peplus*) and hedge mustard (*Sisymbrium officinale*). Additional weedy colonising species are buddleja (*Buddleja davidii*), nipplewort (*Lapsana communis*), shepherd's purse (*Capsella bursa-pastoris*), fat hen (*Chenopodium album*), spear thistle (*Cirsium vulgare*) and coltsfoot (*Tussilago farfara*). The Mediterranean shrub species Christ's thorn (*Paliurus spina-christi*) was found naturalised in one location but is undoubtedly a garden escape. The highly invasive Japanese knotweed (*Fallopia japonica*) is also found in a couple of locations in O'Devaney Gardens.

Recolonising bare ground habitat is not listed in the Habitats Directive. Plate 8.3 illustrates this habitat type on the site and Plate 8.4 shows Japanese

knotweed also on the site. Figure 8.1 indicates locations of recolonising bare ground habitat on the site.



Plate 8.3: Recolonising bare ground habitat (ED3)



Plate 8.4: The invasive shrub, Japanese knotweed (*Fallopia japonica*)

8.3.2.6 Treelines (WS2)

Treelines are also present in a couple of locations although the trees present are not very mature. Species include hornbeam (*Carpinus betulus*) and Italian alder (*Alnus cordata*).

Treelines are not listed in the Habitats Directive. Plate 8.5 illustrates this habitat type on the site inside the former boundary with St Bricin's Hospital. Figure 8.1 indicates locations of treelines on the site.

Plate 8.5: Rank grassland (GS2)/scrub (WS1) and treeline inside the former boundary with St Bricin's Military Hospital,



8.3.2.7 Mosaic of scrub (WS1)/grassland (GS2)/recolonising bare ground (ED3)/non-native shrub (WS3)

Inside the former boundary of O'Devaney Gardens with St Bricin's Hospital is an area which was formerly managed as amenity grassland but has become overgrown. This habitat is not categorised as scrub but can instead be described as a mosaic of different habitats including scrub, non-native shrub, rank grassland and some of the species are typical of recolonising bare ground. Brambles (*Rubus fruticosus*) are present in places, as are nettles, spear thistles, broad dock and burdock (*Arctium minus*). Grass species include meadow fescue (*Festuca pratensis*), creeping bent grass (*Agrostis stolonifera*), false oat (*Arrhenatherum elatius*), couch grass (*Elymus repens*) and cocksfoot (*Dactylis glomerata*). Other species include hoary willowherb (*Epilobium hirsutum*), robin-run-the-hedge (*Galium aparine*), field thistle (*Cirsium arvense*), yarrow (*Achillea millefolium*), ragwort (*Senecio jacobaea*) and ribwort plantain (*Plantago lanceolata*). Additional species are Canadian fleabane (*Conyza canadensis*), hemlock (*Conium maculatum*), weld (*Reseda luteola*), and broad willowherb (*Epilobium montanum*). Formerly cultivated shrubs can be found in parts of this area and include species such as bay laurel (*Laurus nobilis*), garden privet (*Ligustrum vulgare*), and cherry laurel (*Prunus laurocerasus*).

None of the habitats included in this mosaic are listed in the Habitats Directive. Plates 8.5 and 8.6 illustrate this habitat mosaic and Figure 8.1 indicates its location.

Plate 8.6: Non-native shrubs inside the former boundary with St Bricin's Hospital, O'Devaney Gardens



8.3.2.8 Fauna

Protected Mammals

On the evening of August 26th 2009, the temperature was approximately 14°C at sundown and bat foraging activity was recorded, using a heterodyne (tuneable) detector, along the former St Bricin's Hospital boundary and within the proposed redevelopment area. Three species were observed, common

pipistrelle, soprano pipistrelle and Leisler's bats. The common pipistrelle was the most abundant of the three species.

No existing roosts were confirmed from the site but it is possible that crevices in buildings on the site are used by roosting bats on occasion.

A number of bat records are listed on the Bat Conservation Ireland database (www.batconservationireland.org) within a 1km radius of the present site. These include a dead specimen of whiskered bat (*Myotis mystacinus*) that was recovered from the Phoenix Park and a Leisler's bat roost that was recorded at the Phoenix Park within 1km of the present site in the 1990s.

Bats are protected under the Wildlife Act (1976 and subsequent amendments) and listed in Annex IV of the EU Habitats Directive as requiring strict protection. Ireland is also signatory to the Eurobats Agreement. The common and soprano pipistrelle are probably Ireland's commonest bat species and are found in urban and rural areas. The Leisler's bat, though relatively frequent, is considered to be of international importance due to its rarity in other European countries. All are listed in the Red Data Book (Whilde, 1993).

No badgers (*Meles meles*), hares (*Lepus timidus hibernicus*) or stoats (*Mustela erminea*) were found on the site. These species are unlikely to occur.

The pygmy shrew (*Sorex minutus*) may occur on the site and is a protected mammal.

Hedgehog (*Erinaceus europaeus*) may be present in the area. The hedgehog is protected under the Wildlife Acts.

Mammals not protected under Wildlife Legislation

Brown rats (*Rattus norvegicus*) are likely to occur. Rabbits (*Oryctolagus cuniculus*) were not confirmed on the site. While foxes (*Vulpes vulpes*) were not confirmed from the site this species is likely to occur from time to time. Mice, rats and foxes are not considered rare or of conservation importance and are not protected under conservation legislation.

Birds

A number of bird species were observed during field work. Table 8.2 shows a list of bird species recorded from the site of the proposed development. Most of these may be expected from gardens within a city area or along field boundaries in a rural area. The trees and scrub in nearby Phoenix Park provide good cover and food sources for many songbird species, some of which were recorded from the present site. Songbirds such as robin, blackbird, goldfinch, wren and tit species were among the species recorded in the overgrown area inside the former boundary with St Bricin's Hospital. Feral pigeons and members of the crow family such as jackdaws, rooks and magpies were relatively common throughout. A number of seabirds were observed in flight over the site and the Red-listed herring gulls were confirmed nesting on the roof of St Bricin's Hospital. Birds of prey such as kestrels are also likely to occur from time to time.

All song birds are protected under the Wildlife Acts 1976 and 2000. No Annex I listed (Birds Directive) bird species were observed during the survey. The only Annex I species that may occur over the site from time to time is the peregrine falcon, although there is no evidence for regular visits to the area by this species (e.g. www.dublinbirding.ie).

Table 8.2: Bird Species recorded at the site of the Proposed Development	
Species Latin Name	Species Common Name
<i>Apus apus</i>	Swift
<i>Carduelis carduelis</i>	Goldfinch
<i>Carduelis chloris</i>	Greenfinch
<i>Columba palumbus</i>	Feral pigeon
<i>Corvus frugilegus</i>	Rook
<i>Corvus monedula</i>	Jackdaw
<i>Erithacus rubecula</i>	Robin
<i>Fingilla coelebs</i>	Chaffinch
<i>Larus argentatus</i>	Herring gull
<i>Larus ridibundus</i>	Black-headed gull
<i>Parus ater</i>	Coal tit
<i>Parus caeruleus</i>	Blue tit
<i>Pica pica</i>	Magpie

Amphibians

Frogs (*Rana temporaria*) were not confirmed from the site and since there are no aquatic habitats this species is unlikely to occur.

Invertebrates

The butterflies meadow brown (*Maniola jurtina*) and small tortoiseshell (*Aglais urticae*) were recorded from the site in July. Additional species such as red admiral (*Vanessa atalanta*) are likely to occur at other times. These species are widespread throughout Ireland and are not listed for protection under the Wildlife Acts or Habitats Directive. Relatively few large invertebrates were noted from the site. Damsel and dragon flies were absent during the June and July surveys.

Bumblebees were frequent in the meadow and surrounding weedy areas. Species identified were the 'near threatened' but relatively common *Bombus lapidarius* and *Bombus pascuorum*, the status of which is described as 'Least concern' (see www.tcd.ie/zoology/research/bees). Table 8.3 shows a list of butterfly and bumblebee species recorded from the site of the proposed development

Table 8.3: Butterfly and bumblebee species observed in flight on the site in June and July 2009	
Species Latin Name	Species Common Name
Butterflies	
Meadow brown	<i>Maniola jurtina</i>
Small tortoiseshell:	<i>Aglais urticae</i>
Green-veined white:	<i>Artogeia napi</i>
Bumblebees	
<i>Bombus pascuorum</i>	
<i>Bombus lapidaries</i>	

8.3.3 Significance

8.3.3.1 Habitats and Flora

The area proposed for (the entire) development consists 5.6ha hectares of built-over land, various grassland habitats and recolonising bare ground habitat. There are no protected habitats or floral species present on the site. The floral species present are, for the most part, typical of those found in urban Dublin. The overgrown area close to St Bricin's Hospital and tree lines are of limited importance for providing shelter and food resources for songbirds and bats.

8.3.3.2 Fauna

Bats are the most highly protected faunal species that occur on the site. Treelines are important connective features that the relatively common species of bats found on the site use for commuting and foraging.

The pygmy shrew, a protected mammal may occur on the site, and other protected mammals such as hedgehogs may also occur. These species are widespread throughout Ireland.

A number of song birds, also protected, are present. None of the species found are, however, considered rare in a national or EU context.

Bumblebees were frequent on the recently sown wildflower meadow and on ruderal plants throughout the site. These included the near threatened *Bombus lapidarius*, which is, however, relatively frequent in Ireland.

The site proposed for development is not situated adjacent or close to any nature conservation designated areas. The nearest pNHAs are the Royal and Grand Canals both situated approximately 2km away. The proposed redevelopment at the site is unlikely to impact either Canal. The site is situated close to the Phoenix Park which, while not designated as a conservation area, does support several rare species and habitats.

8.3.4 Sensitivity

8.3.4.1 *Flora and Vegetation*

The habitat types on the site are not semi-natural. No protected habitats or species were found. Some overgrown and recently planted areas provide flowering plants for foraging bumblebees and other invertebrates. The overgrown area inside the former St Bricin's Hospital boundary provides a connective treeline for foraging bats and some flowering plants for invertebrates and seed-eating song birds such as goldfinches. These areas are limited in extent and have arisen fairly recently and as such have very limited conservation importance. All habitats providing foraging or shelter for the faunal species noted could be recreated or replaced relatively easily.

The site is within the catchment of the Liffey, which although of poor water quality near this location, may be impacted negatively by excessive siltation were this to occur as a result of the proposed redevelopment.

There is potential for dust arising from demolitions and soil disturbance on the site and settling on vegetation in the Phoenix Park and elsewhere.

8.3.4.2 *Fauna*

Soprano and common pipistrelle bats are both very adaptable species that are relatively common in urban environments provided there is sufficient insect prey availability, some relatively unlit green spaces for foraging, and often where there are ponds or streams (retained or developed) which boost insect availability. Leisler's bats tend to be equally adaptable to foraging in urban areas, provided green spaces are retained or developed.

Most of the bird species present can adapt to garden or urban environments provided green spaces are retained/developed and some unlit hedgerow or treeline habitats are provided to allow sheltered nesting.

Development of the site may result in disturbance of pest species such as rats and an increase in the occurrence of these species in local residences or gardens.

The large invertebrates identified from the site, all of which require flowering plants for food, can be considered adaptable and frequent in Dublin's urban environment.

8.3.4.3 *Conservation designated areas, Phoenix Park, River Liffey*

The Grand Canal to the south, and Royal Canal to the north/east are the closest designated sites and are urbanised aquatic habitats with relatively few species of conservation importance. They are important linkage features for wildlife, however, and some rare protected plants, for example opposite-leaved pondweed (*Groenlandia densa*) do occur along the waterways. It is possible that dust arising from demolition and soil movements on the site could settle in these canals and have a short term negative effect, although the distance from the canals to the site means that any dust arising is likely to have deposited before it reaches these proposed protected areas.

The River Liffey is situated much closer to the proposed redevelopment site and it is possible, also, that silted run-off could flow into the Liffey from the site. Upstream, the Liffey supports a salmonid fishery and is a proposed Natural Heritage Area which is sensitive to pollution or siltation but at the site's city location the river already has a relatively high silt load. Effects from silted run off or air-borne dust settling on the river here would be negligible, nonetheless, silt and dust prevention measures are recommended to prevent such instances occurring.

There is potential, albeit unlikely, for dust arising from works on the O'Devaney Gardens site depositing on sensitive vegetation or flora in the Phoenix Park. Dust prevention measures are recommended to prevent such instances occurring.

Possible impacts of the proposed development on more distant SACs and SPAs are discussed in detail in the accompanying Appropriate Assessment but the development at O'Devaney Gardens is not anticipated to have any direct impacts, positive or negative.

8.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Some areas currently categorised as amenity grassland, grass verge habitat, recolonising bare ground and scrub habitat will be replaced by buildings, roadways, footpaths and various forms of hard and soft landscaping.

8.5 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

8.5.1 'Do Nothing Impact'

The present management of the site involves mowing amenity grassland and spraying herbicides on areas of paving. Rank grassland such as that found inside the former boundary with St Bricin's Hospital, will continue to develop into scrub habitat over time. Species such as ash and willow will increase here and this will result in an increase in song bird activity on the site. Abandonment of flat blocks may increase the likelihood of bats roosting on the site.

8.5.2 Predicted Impact

8.5.2.1 Construction Phase

The construction phase will result in removal of 5.6ha of man-made habitats: Built land, recolonising bare ground, grass verge habitats and recently sown wildflower meadow.

There may be increased levels of dust as demolition works, soil movement and construction works take place.

There will be a temporary decrease in available foraging habitat for large invertebrates such as bumblebees and butterflies, until landscaping has been completed. There may be a temporary decrease in available nesting and foraging habitat for song birds. There may be a temporary decrease in available foraging habitat for bats until landscaping has been completed.

The proposed redevelopment of the site should not result in any changes to the Phoenix Park or to any nature conservation designated areas. Any increase in dust during demolition and site clearance will be temporary in nature.

During site clearance there is potential for further spread of the invasive shrub species Japanese knotweed. This shrub occurs to the north of the site. Ideally this plant should be sprayed during the growing season with a glyphosate herbicide and dead stems should be removed. The base of the plant should be further treated with herbicide prior to removal or spread of soil around its base.

8.5.2.2 Operational Phase

Tree lines will be planted, thus replacing bat foraging habitats lost during construction.

Landscaping will be carried out to include native species and species providing foraging opportunities for large invertebrates.

The site could potentially be improved to provide more suitable habitat and shelter for songbird species since few occur on the current site.

Songbirds are likely to move into the area and nest in trees planted during landscaping.

There will be an increase in streetlighting throughout the site.

There will be an increase in traffic from current levels.

8.6 MITIGATION MEASURES

8.6.1 Prior to Construction

Do not remove trees or shrubs during the nesting season (March 1st to August 31st).

8.6.2 Construction Phase

Since there are no semi-natural habitats and few species of conservation interest that occur on the site it should be possible to replace what is of limited local importance and even improve the site for biodiversity.

8.6.3 Flora

8.6.3.1 Wildflower Meadows

Suitable planting, perhaps in the form of wildflower meadows (including native clover species) or low cut floral lawns dotted around the site or in one relatively large area, should be provided for bumblebees and other nectar feeders. Additional planting that may include non-native species but which are known to attract bees and other invertebrates may also be used. Teasel can be included to attract seed-eating finch species. Wildflower meadows/floral lawns must be managed appropriately in order to maintain their biodiversity,

therefore the site manager and/or relevant Dublin City Council staff should be informed of appropriate management regimes when landscaping is completed. A list of suppliers of native wildflower seeds is provided.

8.6.3.2 Tree lines

For tree lines it is recommended that these be planted with native species, and where possible underplanted with native shrubs (list provided in Table 8.4). Trees should be allowed to grow to their maximum girth and height in order to provide optimal conditions for shelter and nesting for songbirds. Lighting of tree lines with street lights is not recommended.

Table 8.4: Native Tree and Shrub Species Recommended for Landscaping	
Species Common Name	Species Latin Name
Ash	<i>Fraxinus excelsior</i>
Pedunculate oak	<i>Quercus robur</i>
Silver birch	<i>Betula pendula</i>
Downy birch	<i>Betula pubescens</i>
Scots pine	<i>Pinus sylvestris</i>
Rowan	<i>Sorbus aucuparia</i>
Cherry	<i>Prunus avium</i>
Aspen	<i>Populus tremula</i>
Alder	<i>Alnus glutinosa</i>
Hazel	<i>Corylus avellana</i>
Hawthorn	<i>Crataegus monogyna</i>
Grey willow	<i>Salix cinerea</i>
Goat willow	<i>Salix caprea</i>
Purple osier willow	<i>Salix purpurea</i>
Holly	<i>Ilex aquifolium</i>
Guelder rose	<i>Viburnum opulus</i>
Broom	<i>Cytisus scoparius</i>
Spindle tree	<i>Euonymus europeaus</i>
Native Climbers	
Honeysuckle	<i>Lonicera periclymenum</i>
Ivy	<i>Hedera helix</i>
Non-native Species with Good Wildlife Value	
Sycamore	<i>Acer pseudoplatanus</i>
Field Maps	<i>Acer campestre</i>

At least one unbroken tree line should be planted in a north south direction from end of the site to the other, as well as from east to west.

8.6.4 Fauna

8.6.4.1 Bats

No evidence was found for bats emerging at night from any of the flat blocks during the bat survey. However, should bats be found prior to or during demolition works should cease and the local National Parks and Wildlife Conservation Ranger should be contacted for advice on how to proceed.

Tree lines as described above should be planted to improve the site for foraging and commuting bats. Street lighting should be kept to a minimum. Where possible tree lines should not be lit at night.

5 x woodcrete bat boxes (1FR Bat Tube) should be placed on south facing walls (at least 4m height) throughout the site, preferably adjacent to green spaces. Bat boxes should be placed above clear wall space (i.e. not above windows or doorways). Ideally, bat boxes should be sited with advice, onsite, from suitably trained bat worker.

8.6.4.2 Birds

The planting of tree lines with native species, and other landscaping such as planting wildflower meadows, should benefit song birds and facilitate increases in numbers of these species using the site.

In addition, it is recommended that 10 x Schwegler No 18 nesting boxes for swifts be placed under soffits of buildings around the site (out of direct sunlight). As per bat boxes these should be placed over clear wall spaces, not above windows or doorways.

10 x Schwegler Sparrow Terrace nesting boxes for sparrows should also be placed on buildings around the site (out of direct sunlight) and not over windows or doorways.

8.6.5 Dust, Sediment and Pollution

Appropriate measures should be taken to prevent movement of dust into adjacent habitats, such as the Phoenix Park during site demolition, clearance and reconstruction. Appropriate measures include covering flat blocks with synthetic fabric to contain dust during demolition, erection of plywood barriers around the site and bunding demolition waste prior to its removal from the site. A petrol/oil interceptor should be incorporated into the surface water system to prevent petrol or oil runoff into the Liffey catchment. All fuel tanks should be located in a suitable area and fully bunded. Inlets and outlets for these should be located within the bunded area.

8.6.6 Operational Phase

Maintain flowering lawn and/or wildflower meadow as per directions from supplier.

8.7 MONITORING

Circular letter NPWS 2/07 was considered as part of the Flora and Fauna element of the Environmental Impact Assessment. However, since the only protected species under the EU Habitats Directive were bats found in flight along a tree line on the site, and because several tree lines will be included as part of the landscaping of the proposed development, a derogation licence is not required because there is likely to be a net gain in bat foraging habitat as part of the proposed development. No bat roosting sites were found on the site proposed for redevelopment so derogations licences are not therefore required to allow legal exclusion or relocating.

8.8 REINSTATEMENT

No habitats of conservation importance are being removed therefore no recommendations are made regarding reinstatement. With suitable planting and landscaping it is likely that local biodiversity and conservation value of the site will increase over time.

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