AtkinsRéalis

Newbridge Habitat Mapping

Kildare County Council

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Newbridge & Environs Habitat Mapping Report

AtkinsRéalis - Baseline / Référence

Newbridge Habitat Mapping

Newbridge and Environs Habitat Mapping Report

Kildare County Council

December 2024

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Document history

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1. Introduction

1.1. Scope of the Project

The value of the natural and semi-natural habitats in Ireland is widely recognised, if not always fully appreciated. Natural areas provide homes for wildlife, trees, and wildflowers, but they also provide a wide range of benefits for the humans that live and work in and near them, including opportunities for recreation and relaxation, protection of soil and water quality, flood regulation, carbon sequestration, and sustainable production of food and fuel. Lately, we have come to recognise that habitats in and around urban areas can be just as important in many ways as larger, wilder areas in the country (Miller and Hobbs, 2002; Dearborn and Clark, 2010). Suburban gardens can provide nectar for bees and butterflies, bats can roost in old buildings, and urban trees can clean the air and provide shelter from sun and wind.

In recognition of the importance of urban and suburban habitats Kildare County Council has policies relating to their identification, conservation, and management. The *Kildare County Development Plan* (2023-2029) proposes actions to address biodiversity in County Kildare. These are set out in Box 1.1, on page 13. A crucial part of achieving these goals is to gather information on the habitats within County Kildare. Accordingly, in the autumn of 2022 Kildare County Council, commissioned Atkins to identify Green Infrastructure within Newbridge.

The primary aims of this project were to survey, map and assess habitats within Newbridge town, to identify Green Infrastructure, and to raise awareness about the natural heritage of these towns. Achieving these aims is necessary if semi-natural habitats are to be managed for the benefit of people, animals, and plants. Information on habitat quality and location permits identification of a Green Infrastructure network for County Kildare: i.e., *interconnected green spaces that conserve biodiversity and provide ecosystem services to people*. Understanding the location, extent and characteristics of Green Infrastructure is essential for managing its sustainably. The main mechanisms for doing this are strategic plans, such as city/county development plans, associated local area plans and practical management plans and strategies that will be developed in the future.

The project study area for this report is Newbridge within County Kildare as shown in Figure 1.1 below.

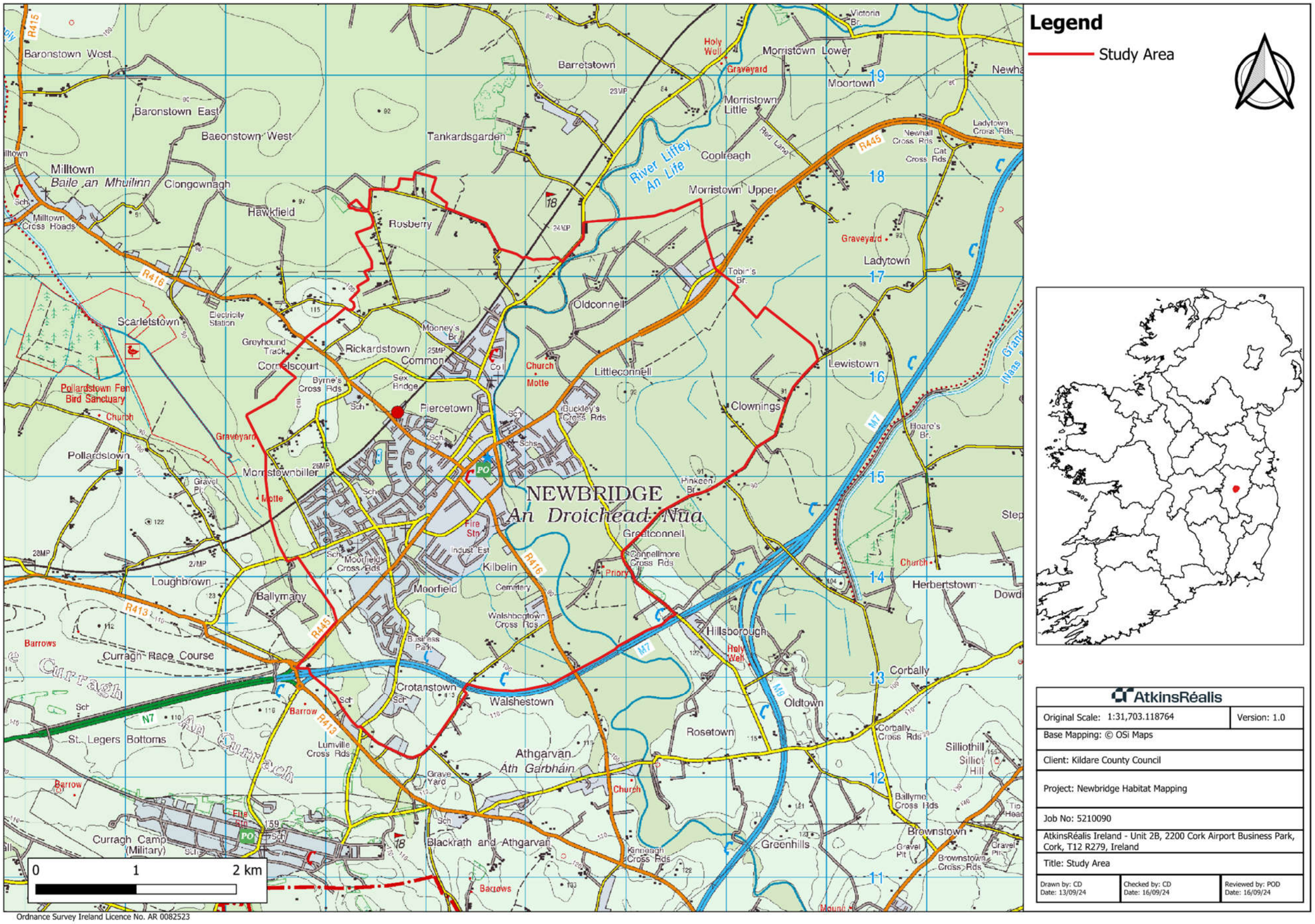

Figure 1.1 - Newbridge Habitats Survey Study Area (Source: OSI Maps).

1.1.1. Habitat Surveying

A Guide to Habitats in Ireland (Fossitt, 2000) defines habitats as *"…. the basic building blocks of the environment that are inhabited by animals and plants, and which are important as units for site description and conservation management*". Habitats are defined by the living things that are found there, mainly plants, and also by environmental conditions, such as geology, water, topography, and human management. Furthermore, Fossitt (2000) classifies Irish habitats in a number of types in a hierarchy under a few broad categories, such as grasslands, freshwater bodies, cultivated and built land, peatlands, and woodlands.

Information on the type, location and extent of habitats is collected during a habitat survey. This can be used to prepare a habitat map, which can clearly and simply outline the spatial characteristics of habitats in an area, particularly any linkages amongst them.

1.1.2. Habitat Evaluation and Site Designation

One piece of information on habitats that is frequently collected during surveys is the ecological value of a particular habitat. Habitats are evaluated on a number of criteria, including their rarity, the abundance and diversity of species they support, how natural or modified by humans they are, their fragility, and their size. Habitats of greater nature conservation importance should be offered greater protection than those of lesser value.

The EU has identified a number of habitat types that are most important across Europe. Fifty-nine of these internationally valuable habitats are found in Ireland. These habitat types are listed in Annex I of the EU Habitats Directive (92/43/EEC), and the Habitats Directive also requires member states to identify sites that contain representative examples of these habitat types. These are known as Special Areas of Conservation (SACs)[1]. For example, Pollardstown Fen Special Area of Conservation (SAC) is located on the western outskirts of the Newbridge study area (Figure 1.2); site code 000396. Pollardstown Fen is also a Nature Reserve with an area of 130ha[2]. Ballynafagh Lake (Blackwood Lake) (WFS-30) is one of 68 Wild Fowl Sanctuaries in the State. These sanctuaries are areas that have been excluded from the 'Open Season Order' so that game birds can rest and feed undisturbed. Shooting of game birds is not allowed in these sites.[3]

Mouds Bog SAC (site code: 000395) is located to the north of Newbridge study area. The River Barrow and River Nore SAC (site code: 002162) lies ca. 17km to the south-west of Newbridge. Natura 2000 sites in the environs of Newbridge study area are presented in Figure 1.2 below.

[1] For further information on SACs see http://npws.ie/protectedsites/

[2] Kildare | National Parks & Wildlife Service (npws.ie)

[3] Wildfowl Sanctuaries | National Parks & Wildlife Service (npws.ie)

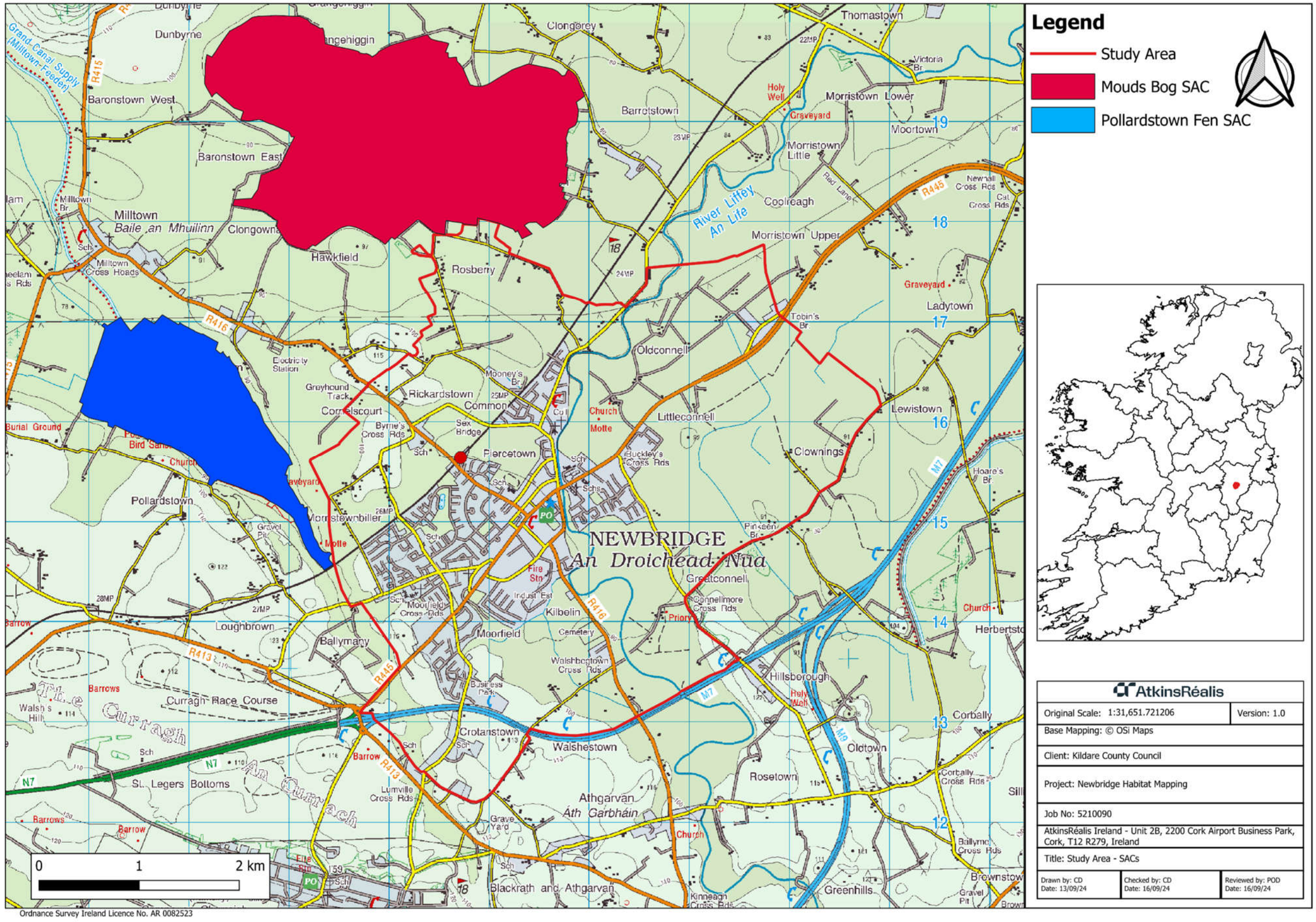

Figure 1.2 - Location of Newbridge study area in relation to proximate to SACs (Source: OpenStreetMap).

At the next level of designation, sites that are of national ecological importance because of the habitats, species, or geological features they support are designated as Natural Heritage Areas (NHAs). The Grand Canal pNHA (site code: 002104) lies ca. 3.2km to the east of Newbridge. The Curragh (Kildare) pNHA (site code: 000392) lies ca. 2km to the south of the study area. There are no Special Protected Areas (SPA) in the vicinity of Newbridge.

SACs and (proposed) Natural Heritage Areas (pNHAs/NHAs) within 10km of the Newbridge study area are shown in Table 1.1 below.

A species search using the National Biodiversity Data Centre (NBDC)[4] database was undertaken for 10km grid squares N81 and N71 in which the Newbridge study area is located. These are demonstrated in the context of the Newbridge study area in Figure 1.3 below.

Figure 1.3 - Location of Newbridge study area in relation to proximate to N71 and N81 grid square as according to the NBDC database (Source: Google Maps).

[4] https://maps.biodiversityireland.ie/Map

American Skunk-cabbage (*Lysichiton americanus*), Himalayan balsam (*Impatiens glandulifera*) and Japanese Knotweed (*Fallopia japonica*) which are Third Schedule, legally restricted invasive species were recorded within the 10km grid square N81 which encompasses the eastern side of the study area. Further, Fringed Water-lily (*Nymphoides peltata*), Giant Hogweed (*Heracleum mantegazzianum*) and Japanese Knotweed (*Fallopia japonica*) and Himalayan Balsam (*Impatiens glandulifera*), which are Third Schedule plants, were recorded within the 10km grid square N81, which also encompasses the eastern side of the study area. Japanese Knotweed (*Fallopia japonica*) is recorded in the 10km grid square N71 which encompasses the western side of the study area. Other invasive species which are not legally restricted recorded within the 10km grid squares include Butterfly-bush (*Buddleja davidii*), Cherry Laurel (*Prunus laurocerasus*), Sycamore (*Acer pseudoplatanus*), Three-cornered Garlic (*Allium triquetrum*), Japanese Rose (*Rosa rugosa)* and Pitcherplant (*Sarracenia purpurea*) were also recorded within the Newbridge Study Area.

There are records of Freshwater White-clawed crayfish (*Austropotambius pallipes*) on the River Liffey, which traverses Newbridge. This species was recorded at the most northerly point of the study area (100m grid square: N818177) at the station name '2.5km d/s of Newbridge' in 2007 and at the southern edge of the study area at the station name 'Connell Ford' in 2007 (NBDC). There are no records on this watercourse for the protected mollusc, freshwater Pearl mussel (*Margaritifera margaritifera*); nor does Newbridge lie within a Margaritifera Sensitive Area. However, along the western edge of the site boundary the Barrow catchment overlaps with the study area which is a 'Catchments with previous records of *Margaritifera*, but current status unknown.' For lamprey species (*Lampetra planeri, Petromyzon marinus, Lampetra fluviatilis*), according to the NBDC no records occur at or downstream of Newbridge. Otter (Luta lutra) have been recorded by the NBDC throughout the study area.

A data information request was submitted to the NPWS in relation to species recorded in the vicinity of the proposed works. Shapefiles received from the NPWS on the 22nd of May 2024 were reviewed in relation to the Newbridge study area. White-clawed Crayfish (*Austropotambius pallipes*) was recorded in the centre of the study area along the River Liffey in 2002, 2001 and 2000. White-clawed Crayfish has been recorded again ca. 2.5km downstream in 2002. Other species recorded within the study area by the National Parks and Wildlife Service (NPWS) include Common Frog (*Rana temporaria*), Red hemp-nettle (*Galeopsis angustifolia*), European Hedgehog (*Erinaceus europaeus*), Meadow Saxifrage (*Saxifraga granulate*), Eurasian Badger (*Meles meles*), Irish Hare (*Lepus timidus* subs*p. hibernicus*), Eurasian Otter (*Lutra lutra*), Eurasian Red Squirrel (*Sciurus vulgaris*), Stoat (*Mustela erminea*), Henbane (*Hyosycamus niger*), Red Deer (*Cervus elaphus*), Sika Deer (*Cerphus nippon*), Pine Marten (*Martes martes*), Fly Orchid (*Orphrys insectifera*) and Mountain pansy (*Viola lutea*).

Table 1.1 - Designated sites within 5km of Newbridge Study Area

Site Name	Site Code	Distance from Newbridge study area (over land)	Hydrologically connected to LAP?	Qualifying Interests
Pollardstown Fen SAC[5]/ pNHA	000396	Adjacent to	No (Cloncumber Stream flows away from Newbridge)	• Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210] • Petrifying springs with tufa formation (*Cratoneurion*) [7220] • Alkaline fens [7230] • *Vertigo geyeri* (Geyer's Whorl Snail) [1013] • *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] • *Vertigo moulinsiana* (Desmoulin's Whorl Snail) [1016]
Mouds Bog SAC[6]	002331	Adjacent to	No	• Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the *Rhynchosporion* [7150]
Ballynafagh Lake SAC[7]	001387	Ca. 7.4km	No	• Alkaline fens [7230] • *Vertigo moulinsiana* (Desmoulin's Whorl Snail) [1016] • *Euphydryas aurinia* (Marsh Fritillary) [1065]
Ballynafagh Bog SAC[8]/ pNHA	000391	Ca. 9.1km	No	• Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the Rhynchosporion [7150]
Curragh (Kildare) pNHA	000392	Adjacent to	No	n/a
Grand Canal pNHA	002104	Ca. 1.2km	Yes (Liffey River)	n/a

[5] NPWS (2022). *Conservation Objectives: Pollardstown Fen SAC 000396. Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.
[6] NPWS (2015). *Conservation Objectives: Mouds Bog SAC 002331. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
[7] NPWS (2021). *Conservation Objectives: Ballynafagh Lake SAC 001387. Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.
[8] NPWS (2015). *Conservation Objectives: Ballynafagh Bog SAC 000391. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

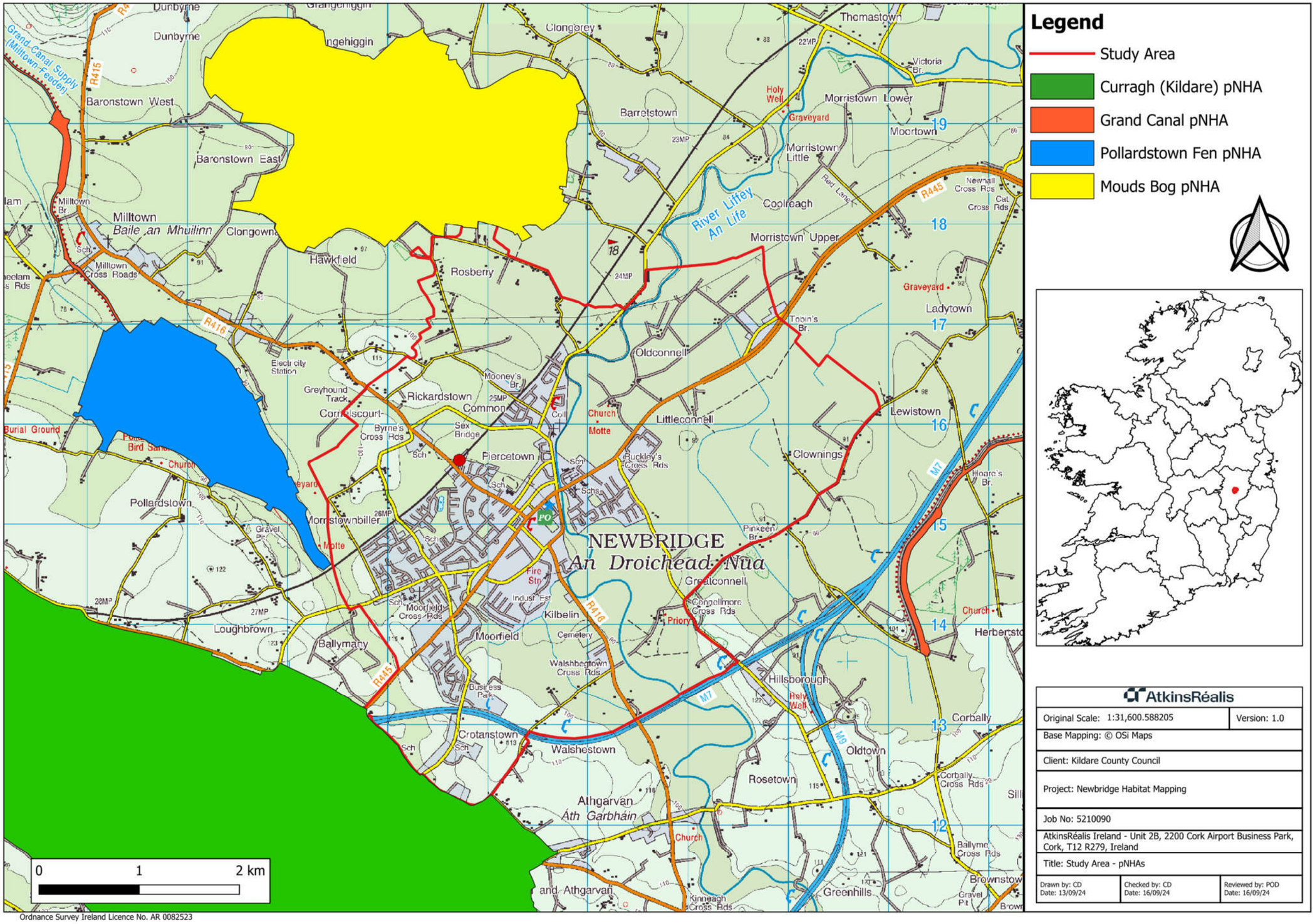

Figure 1.4 - Location of Newbridge study area in relation to proximate to pNHAs (Source: OSI Maps).

1.1.3. Green Infrastructure

1.1.3.1. Ecological Networks

Once habitats have been surveyed and mapped, the next question is how best to manage them. One approach is the establishment of *ecological networks*. Ecological networks are made up of core areas of high biodiversity value connected by corridors or stepping stones. Corridors are more or less linear avenues of habitats that link larger areas of habitats and allow animals, birds and plants to move among them. Examples of corridors could be hedgerows linking areas of woodland or rivers and riverside habitats connecting larger areas of wetlands or natural grasslands. Stepping stones are more isolated habitat patches located in built-up areas or intensive farmland that allow animals and plants to jump between core habitat areas. Stepping stones could include small wetlands or ponds in farmland, grasslands that have developed on abandoned quarries, or even urban parks. The importance of corridors and stepping stones is that it reduces ecological fragmentation in the landscape. Increasing connectivity among habitats gives plants and animals greater access to living space and other resources, allows them to recolonise areas where they may have been lost, and maintains their health by reducing inbreeding.

Under the Article 10 of the Habitats Directive, planning and development policies must endeavour to conserve and manage sustainably corridors and stepping stone habitat features essential for the migration, dispersal and genetic exchange of plants and animals. Improving the connectivity and coherence of the network of SACs and SPAs is a particular objective of the Habitats Directive.

1.1.3.2. Green Infrastructure

The idea of ecological networks has recently been expanded into the concept of *Green Infrastructure*. Rather than focusing solely on biodiversity, Green Infrastructure also takes into account the benefits that green areas can provide for humans. According to the recently published report, *Creating Green Infrastructure for Ireland* (Comhar, 2010): -

Green Infrastructure is a strategically planned and managed network featuring areas with high quality biodiversity (uplands, wetlands, peatlands, rivers and coast), farmed and wooded lands, and other green spaces that conserve ecosystem values which provide essential services to society.

The concept of Green Infrastructure highlights both the intrinsic importance of natural habitats and also the ecosystem services they provide to humans. Ecosystem services performed by Green Infrastructure can include a wide range of things, such as: -

- Providing clean water
- Providing food, both directly and also indirectly, such as by supporting populations of bees to pollinate crops
- Controlling surface water and flooding
- Regulating local climate, such as providing shade or shelter from wind, and global climate through carbon sequestration
- Conserving soil and soil nutrients
- Conserving historic landscapes and built and cultural heritage
- Providing spaces for recreation and sport, improving the physical well-being of people
- Improving the mental and spiritual well-being of people, enhancing quality of life and providing a connection between people and nature

The Green Infrastructure concept is primarily a planning tool (see also Box 1.1). Identifying the location and characteristics of Green Infrastructure is essential if the ecosystem services they provide are to be managed in a sustainable fashion. Key pieces of Green Infrastructure can be identified and taken into account when preparing plans, such as local area plans, biodiversity plans and tourism strategies. Similar to habitat survey

and mapping, Green Infrastructure can be mapped using existing data sources supplemented by field survey where required. In fact, a habitat map is a critical piece of baseline information required for Green Infrastructure mapping.

Box 1.1: Kildare Plans & Policy on Green Infrastructure and Natural Heritage.

The following policies protecting and promoting biodiversity are outlined in the Kildare County Development Plan 2023-2029

Biodiversity

Policy

BI P1 - Integrate in the development management process the protection and enhancement of biodiversity and landscape features by applying the mitigation hierarchy to potential adverse impacts on important ecological features (whether designated or not), i.e. avoiding impacts where possible, minimising adverse impacts, and if significant effects are unavoidable by including mitigation and/or compensation measures, as appropriate. Opportunities for biodiversity net gain are encouraged.

Objectives

BI O1 – Require, as part of the Development Management Process, the preparation of Ecological Impact Assessments that adequately assess the biodiversity resource within proposed development sites, to avoid habitat loss and fragmentation and to integrate this biodiversity resource into the design and layout of new development and to increase biodiversity within the proposed development. Such assessments shall be carried out in line with the CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*.

BI O2 - Require, wherever possible, the retention and creation of green corridors within and between built up urban areas and industrial scale developments to protect wildlife habitat value including areas that are not subject to public access.

BI O3 - Actively support the implementation of national biodiversity initiatives such as the All-Ireland Pollinator Plan 2021-2026.

BI O4 - Promote increased public participation in biodiversity conservation by supporting and encouraging community-led initiatives such as native tree planting, the removal of invasive species and the continued preparation of Local Biodiversity Actions Plans for settlements in County Kildare.

BI O5 - Move towards no net loss of biodiversity through strategies, plan, mitigation measures, appropriate offsetting and/or investment in BlueGreen infrastructure.

BI O6 – Apply the precautionary principle in relation to proposed developments in environmentally sensitive areas to ensure that all potential adverse impacts on a designated NHA or Natura 2000 Site arising from any proposed development or land use activity are avoided, remedied, or mitigated.

BI O7 - Pursue insofar as possible and practical, a policy of biodiversity net gain through strategies, plans, developments, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure.

Actions

BI A2 - Carry out habitat mapping on a phased basis and integrate biodiversity considerations and protection measures into the suite of mandatory Local Area Plans and to develop specific policies and objectives that could be incorporated into council programmes and activities.

Natura 2000 Network

Policy

BI P2 - Seek to contribute to maintaining or restoring the conservation status of all sites designated for nature conservation or proposed for designation in accordance with European and national legislation and agreements. These include Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Natural Heritage Areas (NHAs), Ramsar Sites and Statutory Nature Reserves.

Objectives

BI O9 - Avoid development that would adversely affect the integrity of any Natura 2000 site and promote favourable conservation status of habitats and protected species including those listed under the Birds Directive, the Wildlife Acts and the Habitats Directive, to support the conservation and enhancement of Natura 2000 Sites including any additional sites that may be proposed for designation during the period of this Plan and protect the Natura 2000 network from any plans and projects that are likely to have a significant effect on the coherence or integrity of a Natura 2000 Site.

BI O10 - Ensure an Appropriate Assessment Screening, in accordance with Article 6(3) and Article 6(4) of the Habitats Directive, Section 177A of the Planning and Development Act (2001-2022) or any superseding legislation and with DEHLG guidance (2009), is carried out in respect of any plan or project not directly connected with or necessary to the management of a Natura 2000 site to determine the likelihood of the plan or project having a significant effect on a Natura 2000 site, either individually or in combination with other plans or projects and to ensure that projects which may give rise to significant cumulative, direct, indirect or secondary impacts on Natura 2000 sites will not be permitted (either individually or in combination with other plans or projects) unless for reasons of overriding public interest.

BI O11 - Support the establishment of conservation measures and the preparation and implementation of management plans for the conservation of Natura 2000 sites by NPWS, as required by Article 6(1) of the Habitats Directive.

Action

BI A7 - Identify and provide appropriate buffer zones between Designated Sites and areas zoned for development.

Natural Heritage Areas (NHAs) and Nature Reserves

Policy

BI P3 - Ensure that any proposal for development within or adjacent to a Natural Heritage Area (NHA), Ramsar Sites and Nature Reserves is designed and sited to minimise its impact on the biodiversity, ecological, geological and landscape value of the site, particularly plant and animal species listed under the Wildlife Acts and the Habitats and Birds Directive including their habitats.

Objectives

BI O12 - Require the preparation of an Ecological Impact Assessment (EcIA) by a suitably qualified professional for proposals for development within or adjacent to a Natural Heritage Area (NHA)/proposed Natural Heritage Areas (pNHA), to ensure the development is designed and sited to minimise its impact on the biodiversity, ecological, geological and landscape value of the site, particularly plant and animal species listed under the Wildlife Acts. Such assessments shall be carried out in line with the CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.

BI O13 - Support the establishment of conservation measures and the preparation and implementation of management plans for the conservation of NHA sites by NPWS.

Actions

BI A8 - Work with the National Parks and Wildlife Service to identify an appropriate buffer surrounding Pollardstown Fen, based on best available scientific information, in order to protect the ecological integrity of the Fen as a pNHA and SAC and to prevent urban encroachment and environmental degradation of the site in order to support the qualifying interests of the site.

Protected Habitats and Species

Policy

BI P4 – Ensure that any new development proposal does not have a significant adverse impact, incapable of satisfactory mitigation on plant, animal or bird species which are protected by law.

Objectives

BI O15 - Ensure that any new development proposal does not have a significant adverse impact on rare and threatened species, including those protected under the Wildlife Acts 1976 and 2012, the Birds Directive 1979 the Habitats Directive 1992 and the Flora Protection Order species and any species listed under the national red lists or that could be listed on a national red list.

BI O16 - Ensure appropriate species and habitat avoidance and mitigation measures are incorporated into all new development proposals.

BI O17 - Require a derogation licence, where necessary, issued by the DHLGH, in the event of a proposed development impacting on a site known to be a breeding or resting site of species listed in the Habitats Directive (Annex IV species).

BI O18 – Require all applications for new developments to identify, protect and sensitively enhance the most important ecological features and habitats, and incorporate these into the overall open space network, keeping free from development and to provide links to the wider Green Infrastructure network as an essential part of the design process and by making provision for local biodiversity (e.g. through provision of swift boxes or towers, bat roost sites, hedgehog highways, green roofs, etc.).

BI O19 - Require that all biodiversity data gathered in the preparation of planning applications will be made available to the National Biodiversity Data Centre (NDBC).

BI O20 - Conserve and protect habitats and species listed in the Annexes of the EU Habitats Directive (92143/EEC) (as amended), the Birds Directive (20091147/EC), Directive Annex 2, the Wildlife Acts 1976 to 2000, The Wildlife Acts 1976 (as amended) and the Flora Protection Order No 94 of 1999.

BI O21 - Work with bodies such as the NPWS and National Biodiversity Data Centre to ensure that species for which Kildare is a national stronghold such as Green-Flowered Helleborine Orchid, Yellowhammer and Linnet, which are nationally rare or declining, are supported to flourish and seek to ensure the habitat conditions favourable to such species are retained in the county.

BI O22 - Identify and protect areas of high nature conservation value (including but not limited to SAC/SPA/pNHA) and support the landscape features which act as ecological corridors/networks and stepping-stones, such as river corridors, hedgerows, and road verges so as to minimise the loss of habitats and features of the wider countryside which are of major importance for wild fauna and flora in accordance with Article 10 of the Habitats Directive.

Actions

BI A9 - Undertake surveys and collect data to provide an evidence-base to assist the Council in meeting its obligations under Article 6 of the Habitats Directives (92/43/EEC) as transposed into Irish Law, subject to available resources.

County Biodiversity Sites

Policy

BI P5 - Identify and conserve locally important biodiversity sites in the county which contribute to the overall ecological network of County Kildare.

Objectives

BI O23 - Protect, in co-operation with the relevant statutory agencies and other relevant groups, sites of local biodiversity importance (County Biodiversity Sites), not otherwise protected by legislation.

BI 024 - Undertake surveys and collect data to provide an evidence-base to assist the Council in meeting its obligations under Article 6 of the Habitats Directives (92/43/EEC) as transposed into Irish Law, subject to available resources.

BI O25 - Support the designation of County Biodiversity Sites, as NHAs or SACs where appropriate.

Actions

BI A10 - Identify and map County Biodiversity Sites in cooperation with the relevant statutory agencies, other relevant groups and the general public, not otherwise protected by legislation and to identify

specific peatland areas of biodiversity interest for protection, including legal protection where mechanisms are available (including but not limited to Lullymore/Allen/Lodge Bog, Harristown/Dunshane Common, Kingsbog Common, and Suncroft Common).

BI A13 – Work with Teagasc and landowners throughout the county in order to identify suitable, appropriately designed 'Hare's Corner' projects which would create pocket sized habitats that are linked with compatible habitats in the wider landscape in order to enhance biodiversity.

Trees, Woodlands, and Hedgerows

Policy

BI P6 - Recognise the important contribution trees and hedgerows make to the county biodiversity resource climate mitigation, resilience and adaptation

Objectives

BI O26 - Prevent, in the first instance, the removal of hedgerows to facilitate development. Where their removal is unavoidable, same must be clearly and satisfactorily demonstrated to the Planning Authority. In any event, removal shall be kept to an absolute minimum and there shall be a requirement for mitigation planting comprising a hedge of similar length and species composition to the original, established as close as is practicable to the original and where possible linking to existing adjacent hedges. Native plants of a local provenance should be used for any such planting. Removal of hedgerows and trees prior to submitting a planning application will be viewed negatively by the planning authority and may result in an outright refusal.

BI O28 - Promote the integration of boundary hedges within and along development sites into development design so as to avoid "trapped hedges" located to the boundary of houses within the development layout. Encourage the planting of woodlands, trees and hedgerows as part of new developments and as part of the Council's own landscaping works ideally using native plants of local provenance and origin.

BI O29 - Require the undertaking of a comprehensive tree survey carried out by a suitably qualified arborist where development proposals require felling of mature trees; the tree survey shall assess the condition, ecological and amenity value of the tree stock proposed for removal as well as mitigation planting and a management scheme. It should be noted that rotting and decaying trees are an integral part of a woodland ecosystem and can host a range of fungi and invertebrates, important for biodiversity. While single or avenue trees that are decaying may be removed, others that are part of group or cluster may be subject to retention.

BI O30 – Ensure a Tree Management Plan is provided to ensure that trees are adequately protected during development and incorporated into the design of new developments.

BI O31 - Restrict the cutting of hedges during the bird-nesting season (1st March until 31st August), except in certain legally defined circumstances, in accordance with the provisions of the Wildlife (Amendment) Act 2000.

BI O32 - Protect trees which are the subject of Tree Preservation Orders (see Table 12.3 of Kildare County Development Plan 2023-2029) and the 57 Champion and Heritage Trees in Kildare, which are identified on the Tree Register of Ireland.

BI 035 - Protect existing woodlands and trees and substantial areas of deciduous forest which are of amenity value and/or contribute to and interact with their landscape character and ensure that proper provision is made for their protection and management.

Actions

See Actions BI A14 to BI A22 regarding trees and hedgerows.

Inland Waters: Lakes, Rivers, Streams and Groundwater

Policy

BI P7 - Recognise and promote inland waters, natural environmental assets and to protect rivers, streams and other watercourses and, wherever possible, maintain them in an open state capable of providing suitable habitats for fauna and flora while discouraging culverting or realignment.

Objectives

BI O37 – Ensure the protection of rivers, streams, and other watercourses and, wherever possible, maintain them in an open state capable of providing suitable habitats for fauna and flora while discouraging culverting or realignment. Endeavour to re-open previously culverted streams and watercourses through any future development/redevelopment proposals.

BI O38– Require the preparation and submission of an Ecological Impact Assessment (EcIA) including bat and otter surveys for developments along river or canal corridors.

BI O39 – Consult with Inland Fisheries Ireland (IFI) in relation to any development (greenfield development or redevelopment of brownfield sites) that could potentially impact on the aquatic ecosystems and associated riparian habitats while taking account of '*Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites*' (IFI, 2004) and '*Planning for Watercourses in the Urban Environment*' (IFI, 2020).

BI O41 - Maintain riparian buffer zones and potential uses as identified in Table 12.4 when considering potential development and proposed development layouts within or adjacent to waterways.

BI O43 – Consult with Inland Fisheries Ireland (IFI) and Waterways Ireland in relation to any structures designed for crossing fisheries waters. In this regard consideration must be given to the following biological criteria: -

- species of fish required to safely pass
- size of fish required to pass (life stage)
- time of year in which fish passage is required
- high and low design passage flows etc.

BI O44 – Require that expert advice is sought from a suitably qualified bat expert, in developing lighting proposals along river and stream corridors, to mitigate impacts of lighting on bats and other species. The use of artificial lighting shall be avoided in streamside zones and artificial lighting should be restricted unless absolutely necessary in the middle zone. LEDs should, where permitted, be warm white to minimise disturbance to wildlife.

BI O45 – Ensure that any runoff from developed areas does not result in any deterioration of downstream watercourses or habitats and require that pollution generated by a development is treated within the development area prior to discharge to local watercourses.

BI O46 – Generally, prohibit infilling of land adjacent to rivers, including natural floodplains, prior to or during any development. This will only be permitted, where, in the opinion of the planning authority, there is an over- riding public interest in order to provide a key public infrastructure or to provide a more coherent design approach (in line with an approved urban design strategy) but it will be subject to ensuring that adequate compensatory flood storage (if necessary) is provided elsewhere.

BI O47 – Ensure the protection, improvement, or restoration of riverine floodplains and to promote strategic measures to accommodate flooding at appropriate locations including nature-based solutions, in order to protect ground and surface water quality and build resilience to climate change.

BI O48 – Avoid developing walking/cycling trails through sensitive ecological habitats. A multi-disciplinary team including an ecologist and flood risk expert shall review all riverine sites to determine the appropriate zonation and permissible uses.

Wetlands and Ramsar Sites

Policy

BI P8 – Ensure that Kildare's wetlands and watercourses are retained for their biodiversity, climate change mitigation properties and flood protection values and at a minimum to achieve and maintain at least good

ecological status for all wetlands and watercourses in the county by, at the latest, 2027 in line with the Water Framework Directive and Ramsar Convention.

Objectives

BI O49 – Protect wetland sites that have been rated A (International), B (National) C+ (County) and C (Local) importance as identified in the County Kildare Wetlands Survey 2012-2014, (See Tables 12.5 & 12.6). Any development within the zone of influence of these listed wetland sites should be subject to EcIA and where appropriate, hydrological impact assessment.

BI O50 – Protect and conserve wetlands from infilling, drainage, fragmentation, degradation, and resist development that would destroy, fragment, or degrade any wetland identified as part of the County Kildare Wetland Survey 2012-2014, (See Table 12.6 of the CDP).

BI O51 – Ensure that an ecological impact assessment is undertaken in conjunction with proposals involving drainage or reclamation of wetlands identified in Table 12.6. Impact assessment of all developments on peatlands shall consider peatland stability, carbon emissions balance, Hydrology and Ecology.

BI O57 – Support the implementation of the recommendations of the National Peatlands Strategy 2015, as they relate to County Kildare.

Invasive Species And Noxious Weeds

Policy

BI P9 – Implement and support measures for the prevention and/or eradication of invasive species within the county and the control of noxious weeds.

Objectives

BI O58 – Require all development proposals to address the presence or absence of invasive alien species on proposed development sites and (if necessary) require applicants to prepare and submit an Invasive Species Management Plan where such species exist, in order to comply with the provisions of the European Communities (Birds and Natural Habitats) Regulations 2011-2015.

BI O59 – Encourage, through Citizen Science, the public's awareness in the identification and eradication of invasive species and to provide training with respect to potential threats caused by invasive species, particularly their methods of dispersal and appropriate control and removal measures in association with relevant authorities.

Geology

Policy

BI P10 – Maintain and protect the conservation value of geological sites of national or local importance and seek the sustainable management of the county's geological heritage resource as listed in Table 12.7 (see Kildare County Development Plan 2023-2029).

Objectives

BI O60 – Consult with the Geological Survey of Ireland regarding any development proposals within or likely to have an impact on Sites of Geological Importance set out in Table 12.7.

BI O61 – Contribute towards the protection from inappropriate development of Geological Natural Heritage Areas that become designated during the lifetime of this Plan.

Green Infrastructure general

Policy

BI P11 - Identify and map the key elements of the green infrastructure network in Kildare; and seek to protect, enhance, and expand the County's green infrastructure network, through informed, evidence-based methods, which do not threaten the integrity of existing native biodiversity.

Actions

BI A29 - Map tree canopy coverage in urban areas in conjunction with the preparation of statutory Local Area Plans with a view to increasing same by, where possible, 30%, as a minimum.

Green Infrastructure approach to spatial planning

Policy

BI P12 – Recognise the importance of Green Infrastructure in Kildare and protect this valued biological resource, the ecosystem services it provides and the contribution to climate resilience.

Objectives

BI O64 - Ensure the protection, enhancement, and maintenance of Green Infrastructure in Kildare

BI O65 - Support the development of a Regional Green Infrastructure Strategy and the identification, management, development, and protection of strategic GI connections in co-operation with Kildare's neighbouring counties and the Midland and Eastern Regional Assembly.

BI O66 - Develop a strategy, to identify a series of greenbelt/green spaces (in addition to those identified in this CDP) between the growing settlements within Kildare during the lifetime of the Plan with particular attention to the undeveloped areas between Celbridge, Leixlip and Maynooth and to collaborate with South Dublin County Council, where appropriate.

BI O67 - Require that all Local Area Plans protect and manage the Green Infrastructure network in an integrated and coherent manner and add additional local Green Infrastructure corridors where possible.

BI O68 – Provide for the incorporation of underpasses and/or Green Bridges at ecologically sensitive locations on the county's road and rail corridors (including those along disused railway corridors) that will facilitate the free movement of people and species through the urban and rural environment.

BI O69 - Promote a network of paths and cycle tracks to enhance accessibility to the Green Infrastructure network across the County, while ensuring that the design and operation of the routes respect, and where possible, enhance the ecological potential of each site.

Actions

BI A30 - Complete the mapping of Green Infrastructure for each town and village in County Kildare and to develop specific policies and objectives for each town specifically by incorporating green infrastructure policies and objectives into the various Local Area Plans as they are being prepared.

BI A31 - Work with Bord Na Mona and other stakeholders to prepare a Green Infrastructure Masterplan that will inform the delineation of core areas, stepping stones and corridors (long distance peatways) as identified in Sections 12.14.6, 12.14.7 and 12.14.8, that may inform the designation of an interconnected Bog of Allen Nature Reserve, Special Amenity Area Order and/or National Peatlands Park.

1.1.4. Newbridge Biodiversity Action Plan 2021-2025

The Newbridge Biodiversity Action Plan 2021-2025[9] was produced as part of the Kildare Community Biodiversity Project (14LDRKLD110901) which received grant aid from Kildare LCDC through the LEADER programme. This programme is financed by the Government of Ireland under the Rural Development Programme 2014-2020 and by the European Agricultural Fund for Rural Development.

This is a shared plan of action for the town to build on the recent progress made to improve areas for biodiversity and to start developing other opportunities to maximise the town's full biodiversity potential. The plan has four main objectives, each with several targets and actions: -

1. **Objective 1:** Making Newbridge wildlife friendly.
2. **Objective 2**: Raising awareness of local wildlife and how to protect it.
3. **Objective 3:** Collecting evidence to track change and measure success.
4. **Objective 4:** Build local capacity to manage and record biodiversity.

Box 1.2 below provides details of the Objectives set out in the Newbridge Biodiversity Action Plan 2021-2025.

Box 1.2: Newbridge Biodiversity Action Plan 2021-2025

Objective 1: Making Newbridge Biodiversity friendly

Target 1.1: Make the town's public spaces more biodiversity friendly

No. 1.1.1

Action: Carry out the following biodiversity habitat enhancement works within the 'Liffey Linear Park': -

A. Eradication of Himalayan Balsam - this should be carried out as part of a wider landscape approach for the River Liffey (see Action 1.3.1)
B. Manage the wide grass verge on the western side of The Strand as a wildflower meadow. Maintain a mown fringe along the path.
C. Create a woodland trail on the bank (under the trees) on the western side of The Strand, allowing native wildflowers such as nettle to grow. Stop the cutting of native Ivy (Hedera helix) that is growing on the trees. Woodland wildflower seeds and bulbs will be planted and sowed.
D. Manage the existing wildflower meadow by cutting and lifting it each year. Plan for this at the beginning of the year. This is suitable for a Heritage Week event demonstrating traditional hand scything.
E. Follow up on the current status of the Liffey Valley Park Plan (KCC, 2011)

No. 1.1.2

Action: Create a pollinator-friendly corridor or 'Bee Highway' all along the R445 from the M7 Junction 12 (Curragh) to the new roundabout at Old Connell on the Naas Road. This would include the management of grass verges, roundabouts, planters and flowerbeds and larger public green spaces /parks along the route with pollinators in mind and the promotion of the initiative. Key sites along the route that could be considered as part of the initiative include: -

- M7 Junction 12 - roundabouts and wide grass verges on approach roads to the roundabouts
- The grounds of Horse Racing Ireland (in consultation with them)
- The steep grass banks on the R445 (between the Keadeen Hotel and the Maxol Service Station)
- The grounds of the Keadeen Hotel (in consultation with the owners)

[9] https://kildarecoco.ie/AllServices/Heritage/BiodiversityandNaturalHeritage/KildareBiodiversityActionPlan/NewbridgeBAP.pdf

- Moore Park (in consultation with the residents) and the green space opposite the garage at the traffic junction.
- Moorefield Crescent and adjacent grass verge (in consultation with the residents and McDonald's)
- Skateboard Park
- Interested commercial businesses located either side of Military Road
- Planting containers and flower beds in the town centre
- Whitewater Shopping Centre (in consultation with the owners)
- Bord na Móna (in consultation with them)
- Town Hall
- St Conleth's Park (in consultation with Kildare GAA)
- Liffey Linear Park
- Schools
- St Conleth's Roman Catholic Church
- Pfizer and Lidl RDC (in consultation with them)
- New roundabout at Old Connell / Little Connell townlands

No. 1.1.3

Action: Develop and implement a landscape masterplan for LHD Parklands and Páirc Mhuire. This plan should follow best practice green infrastructure design principles and include the creation of community friendly biodiversity habitat (e.g. wildflower meadows, community woodland, pollinator friendly flowerbeds, etc.) and natural play.

No. 1.1.4

Action: Complete landscaping works on the sensory garden at Newbridge FRC, LHD Parklands.

No. 1.1.5

Action: Manage the lawn space behind the Town Hall as a bulb and shortcut wildflower meadow. The ground should be gently scarified and overseeded in the autumn with an appropriate seed mix. Management of this meadow should be planned at the beginning of the year.

No. 1.1.6

Action: Manage the grass on the new roundabout at Old Connell / Little Connell townlands as a wildflower meadow. The ground should be scarified and over-seeded in the autumn with an appropriate seed mix. Management of this meadow should be planned at the beginning of the year. It could be managed as part of an overall contract for meadow management across the town.

No. 1.1.7

Action: Develop a planting plan for the Cemetery. Potential for low Yew hedging if trees are not a viable option. Plant native climbers (Ivy and Honeysuckle) along the southern boundary block wall of the new section of St Conleth's Cemetery.

No. 1.1.8

Action: Develop and implement a green infrastructure plan for Main Street. This would include street tree planting, green walls, rain gardens (could be a flower bed of herbaceous perennials and low shrubs) and pollinator friendly planting schemes.

No. 1.1.9

Action: Maintain the pollinator friendly flower beds beside the Garda Station, Athgarvan Rd. & Piercetown.

No. 1.1.10

Action: Manage the grassland at Moorefield Park / Skateboard Park as a wildflower meadow. The ground should be scarified and over-seeded in the autumn with an appropriate seed mix. Management of this meadow should be planned at the beginning of the year. It could be managed as part of an overall contract for meadow management across the town.

No. 1.1.11

Action: Develop natural playgrounds at selected locations across the town. Sites should be selected based on a geographic basis. Some potential sites include: Moorefield Park / Skateboard Park, LDH Parklands, Liffey Linear Park, etc.

No. 1.1.12

Action: Explore the opportunity to manage the wide grass verge in front of Moorefield Crescent as a bulb and short cut meadow. Consult with McDonald's about this project.

No. 1.1.13

Action: Identify a public space to develop a community herb garden.

No. 1.1.14

Action: Explore the potential for a Community Garden in Newbridge.

Target 1.2: Make the town's private lands more biodiversity friendly

No. 1.2.1

Action: Run a 'Free Garden Tree Giveaway' each year on a Saturday morning in Feb / March. Tree mix (whips only) to include: Rowan, Birch, Hazel and Wild Cherry.

No. 1.2.2

Action: Explore the opportunity to carry out the following habitat and visual enhancement works in residential estates in the town: -

- Plant native hedgerows or climbers against internal boundary concrete walls and along the front boundaries of residential estates in the town.
- Manage sections of residential green spaces as wildflower meadows, either bulb, short cut or hay meadows. For bulb meadows species such as Snowdrops, Bluebells, Crocus spp., Muscari, etc. can be planted.
- Create pollinator friendly planting beds by renovating existing shrub / flower beds or creating new ones at suitable locations in estates. The management of these should be taken on by the local residents.
- Plant copses of trees on residential green spaces and manage the grass underneath as bumblebee nesting habitat (left uncut). Plant bulbs and wildflowers into these areas to add colour and increase the biodiversity value.
- Install bird and bat boxes at suitable locations.
- Where possible create a wildlife pond. Secure with fencing if necessary.

Target 1-2 residential estates each year of the Action Plan to work with (all actions should be agreed with the residents). In Year 1, engage with estates that have taken part in the process of developing this plan such as The Seven Springs (see Action 1.2.4) and Moorefield Crescent (see Action 1.2.3). These can then act as 'champions' within the town for other estates in subsequent years.

No. 1.2.3

Action: Explore the opportunity to carry out the following habitat enhancement works at Moorefield Crescent (all actions should be agreed with the residents):

A. Manage a strip of the green along the pedestrian path and under the trees as a bulb and short cut meadow.

B. Consider removing part of the hedgerow beside the bus shelter to deter anti-social behaviour.

No. 1.2.4

Action: Explore the opportunity to carry out the following biodiversity habitat enhancement works at The Seven Springs estate (all actions should be agreed with the residents): -

A. Identify and manage a section of the lawn near the entrance to the estate to be managed as a spring bulb meadow. This could include species such as Snowdrops, Bluebells, Crocus spp., Grape hyacinth (Muscari), etc.

B. Plant a native hedgerow with some edible species along the boundary wall with Standhouse Lawns. Carry out selective removal of conifers along the length to allow for the hedgerow.

C. Re-work the shrub bed at the entrance to create a more pollinator friendly planting mix.

No. 1.2.5

Action: Explore the opportunities with the housing estates adjoining the Liffey (Old Connell Weir, Riverside Park, & River Court) about enhancing the green spaces beside the river. This can include more tree planting and managing the grass as wildflower meadow.

(See also Liffey Valley Park Plan (KCC, 2011) Map Liffey Valley Park A3 Tankardstown to Newbridge College).

No. 1.2.6

Action: Explore the opportunity to augment the strip of daffodils along the roadside on the green of Moore Park with pollinator friendly bulbs such as Snowdrops, Bluebells, Crocus spp., Muscari, etc. This will also increase the flower season and add visual interest. Consider managing this strip as a shortcut meadow during the summer months. (all actions should be agreed with the residents).

No. 1.2.7

Action: Explore the opportunities for biodiversity enhancement features to be incorporated into the redevelopment of St Conleth's GAA Park. These can include Swift boxes, pollinator friendly flower beds and biodiversity signage.

No. 1.2.8

Action: Explore the opportunity with Bord na Móna to enhance the two large lawn areas within their headquarters for biodiversity. This can include the planting of native trees and traditional Irish varieties of fruit trees, and the creation of short-cut wildflower meadows.

No. 1.2.9

Action: Explore the opportunity with Ballymany Stud to manage the grass verge at the entrance to their property as a spring bulb and short-cut wildflower meadow.

No. 1.2.10

Action: Maximise the potential of National School campuses for outdoor learning and biodiversity including the following:

- Develop dedicated wildlife gardens / outdoor learning classroom spaces around the grounds.
- Manage sections of lawn space as wildflower meadows including spring bulbs.
- Plant native trees and hedgerows along the boundaries and where space allows.
- Install habitat boxes such as Swift boxes at suitable locations on the buildings.
- Include signage, made by school pupils as classroom activities

No. 1.2.11

Action: Maximise the potential of Secondary School campuses for outdoor learning and biodiversity including the following: -

- Develop dedicated wildlife gardens / outdoor learning classroom spaces around the grounds.
- Manage sections of lawn space as wildflower meadows including spring bulbs.

- Plant native trees and hedgerows along the boundaries and where space allows.
- Install habitat boxes such as Swift boxes at suitable locations on the buildings.
- Include signage, made by school pupils as classroom activities.

No. 1.2.12

Action: Explore the opportunity to manage the front lawn of the Newbridge Parish Centre as a short cut wildflower meadow.

No. 1.2.13

Action: Explore the opportunity to manage the front lawn of the St Conleth's Parish Church as a bulb and short cut wildflower meadow.

Target 1.3: Make the town's surrounding lands more biodiversity friendly

No. 1.3.1

Action: Participate in a Himalayan Balsam control project for the River Liffey catchment area. The study should include other Invasive Species recorded.

No. 1.3.2

Action: Carry out a hedgerow resilience project by augmenting existing hedgerows in the surrounding landscape with new trees such as Oak, Wild Cherry, etc. This will future-proof hedgerows against the potential impacts of Ash Dieback.

No. 1.3.3

Action: Contact NPWS to explore the possibility of extending the boardwalk from Pollardstown Fen to the Milltown Feeder.

Target 1.4: Deliver species-specific conservation projects

No. 1.4.1

Action: Promote the town as a 'Swift Town' by creating nesting opportunities (Swift boxes on existing buildings and bricks for new developments including new residential and industrial sites), raising awareness locally of the issues facing the species and monitoring existing and new nest box sites.

This could be delivered in partnership with Wild Kildare who require local people to help monitor population numbers.

No. 1.4.2

Action: Create additional nesting opportunities for Bats and raise awareness of their habitats – protected species. This could be delivered in partnership with Kildare Bat Group.

No. 1.4.3

Action: Run a hedgehog conservation project by developing hedgehog corridors throughout the town, focusing on residential gardens, and raising awareness of it and other urban wildlife.

Objective 2: Raising awareness of local biodiversity and how to protect it

Target 2.1: Increase the number of people within the community who are aware of their local biodiversity and who understand the need to conserve it.

No. 2.1.1

Action: Install 2-3 no. interpretation posts at selected locations in the 'Liffey Linear Park'. Topics can include: nettles and butterflies, wildflower meadows, woodland plants and animals, bird life and local cultural and built heritage.

No. 2.1.2

Action: Explore the potential for a series of urban looped walks around the town connecting various sites of natural, built and cultural heritage. Any trail should include interpretation of local biodiversity. Erect a central sign about The Heritage trail.

No. 2.1.3

Action: Run a minimum of 2 wildlife-related events (e.g. walks, talks, workshops) each year. This should use the results of the questionnaire in the back of this Plan as a guide for topics of interest and how to deliver them during Covid 19. These can be delivered as Newbridge-only events or in partnership with other neighbouring communities where appropriate.

No. 2.1.4

Action: Use vacant shop fronts on Main Street to display / interpret the local natural, built and cultural heritage of Newbridge.

No. 2.1.5

Action: Continue to use local social media to raise awareness of local biodiversity and conservation issues.

No. 2.1.6

Action: Explore the opportunity to run a public open day of the meadows in Pfizer and / or the Lidl RDC.

No. 2.1.7

Action: Promote and create awareness of the wealth of conservation sites, both of national and international importance, that surround Newbridge.

Target 2.2: Support education opportunities in schools at all levels

No. 2.2.1

Action: Ensure the local schools have copies of the All-Ireland Pollinator Plan guides for schools and the Junior All-Ireland Pollinator Plan and are aware of all the resources available at www.pollinators.ie/resources

No. 2.2.2

Action: Support the local schools with wildlife events / activities. Where possible this should utilise the different areas of habitat on the campus. This can be a wildlife walk, talk, or workshop.

No. 2.2.3

Action: Install signage to maximise outdoor learning about the different areas of biodiversity habitat on the school grounds. These can be created by the school pupils as part of art class activities.

No. 2.2.4

Action: Develop interpretive signage / written materials / maps targeting the schools use the Liffey Linear Park for nature & fitness activities.

Target 2.3 Provide clear information to different sectors within the community on how they can take actions to enhance their spaces for biodiversity.

No. 2.3.1

Action: Run a half-day weed control workshop to raise awareness of the harmful effects of herbicide use on human health and for biodiversity to different landowners around the town. This workshop should also cover alternative weed control solutions where weed control is necessary and encourage a change of mindset in other situations where 'weeds' could be allowed to grow. Consider organising this event in partnership with other local communities.

No. 2.3.2

Action: Participate in, and if necessary, help organise, a series of county-wide farm talks (min. of 2 per year) that will positively enhance biodiversity in the landscape e.g. utilizing farm green infrastructure for the farm business, farm woodland grants, etc. Communicate the details of each event with the local farming community.

No. 2.3.3

Action: Engage with, and support, the different sectors within the community such as the sporting organisations, industrial estates, businesses, faith communities, schools, etc. about the use of green infrastructure and biodiversity enhancement features as a means of delivering on their needs.

Raise awareness of the resources available such as the All-Ireland Pollinator Plan guides for each sector e.g. they have a guide specifically for Golf Courses and the GAA are setting up a Green Club project.

No. 2.3.4

Action: Develop an Estate Mentoring Scheme for residential committees on how they can enhance biodiversity in their estates. This would be similar to the scheme run by Ennis Tidy Towns. (http://ennistidytowns.com/project/estatementoring-programme/).

Develop a list of 'champions' from residential estates who have delivered actions that improve their estates for residents and biodiversity who can support other interested residential groups.

No. 2.3.5

Action: Post links to the All-Ireland Pollinator Plan guides on social media each year.

No. 2.3.6

Action: Implement a policy of no Invasive plant species in new planting schemes in the town.

No. 2.3.7

Action: Engage with Kildare County Council to ensure that all new developments in the town incorporate best practice green infrastructure design principles (e.g. use of bioswales) and biodiversity features (e.g. Swift bricks, see Action 1.4.1). NTT to make submission to Newbridge Area Plan and County Development Plan when it's up for review.

Green infrastructure design should ideally be done at the planning and design stage. Where plans have developed beyond planning, engage with the developers about the benefits that green infrastructure design can deliver for them.

No. 2.3.8

Action: Support Pfizer and Lidl RDC with the development and implementation of a management plan for their wildflower meadows. Also advise on the best placement of bird boxes on their grounds.

No. 2.3.9

Action: Engage with Horse Racing Ireland and the stud farms about maximising the biodiversity value of their grounds in line with their activities.

Objective 3: Collecting evidence to track change and measure success.

Target 3.1: Build a baseline of data on local biodiversity and track changes

No. 3.1.1

Action: Monitor the Swift population numbers in the town annually and the uptake of newly installed Swift boxes.

No. 3.1.2

Action: Facilitate Wild Kildare's 'Moth Atlas' for the county.

No. 3.1.3

Action: Develop at least 2 bumblebee transects in the town and submit records to the National Biodiversity Data Centre (NBDC)

No. 3.1.4

Action: Develop at least 2 butterfly transects in the town and submit records to the NBDC.

No. 3.1.5

Action: Develop a green infrastructure map of the town that identifies the various green spaces and biodiversity features within the town. This will identify existing ecological corridors, and any gaps, that will help guide future planning and development.

No. 3.1.6

Action: Record all biodiversity records onto the NBDC. Encourage other members of the community to do likewise.

No. 3.1.8

Action: Record and map all biodiversity actions delivered at: https://pollinators.biodiversityireland.ie/

Target 3.2: Measure progress of this Plan on a regular basis

No. 3.2.1

Action: Set up a sub-committee that will be responsible for carrying out an annual review and steering the delivery of this BAP. This should include representatives of different sectors within the community.

No. 3.2.2

Action: The sub-committee shall carry out an annual review of the Action Plan.

No. 3.2.3

Action: Carry out a more detailed mid-term review of the Action Plan.

No. 3.2.4

Action: Carry out a full detailed review of the Action Plan in the final year.

No. 3.2.5

Action: Plan for the updating / renewing of a subsequent 5-year plan to run from 2026-2030

Objective 4: Build local capacity to manage and record biodiversity

Target 4.1: Build the capacity within the community to manage and record biodiversity

No. 4.1.1

Action: Identify all wildlife groups active in Newbridge and make contact and offer help / partner on local projects.

No. 4.1.2

Action: Identify sources of native wildflowers (this should include Yellow Rattle) as places for community seed collections - this can include other donor sources in the county & country (i.e. certified native seed or tree suppliers)

No. 4.1.3

Action: Create an email list of local volunteers who can be called upon for practical conservation volunteering events throughout the year such as management of wildflower meadows, invasive species removal, tree planting, etc. (ensure GDPR guidelines are taken)

No. 4.1.3

Action: Hold an event to communicate this BAP to the local community. Make contact with all the Newbridge groups and individuals who attended the launch in Newbridge Town Hall in February 2020.

No. 4.1.5

Action: Participate in a meeting of all 10 Kildare 2020 BAP applicants to discuss opportunities for collaboration to deliver selected projects outlined in this Plan.

Target 4.2: Build up local resources of materials and equipment to manage and record biodiversity

No. 4.2.1

Action: Install a community polytunnel at a secure location. This will be used to grow all the town's flowers and plants for use in new community planting schemes. This will create the opportunity to raise funds by selling native plants and pollinator friendly plants.

No. 4.2.2

Action: Source meadow maintenance equipment for community use. Options available are to 1) purchase equipment, potentially in partnership with other neighbouring towns and villages; 2) work with the private sector to build up their capacity for managing meadows (hire companies and / or local landscape contractors), or 3) to work with KCC for them to build internal capacity / resources. If working with other neighbouring groups then an annual schedule for its use, maintenance /servicing plans, insurance & other costs should be agreed in advance.

No. 4.2.3

Action: Build-up stock of biodiversity educational resources. Liaise with the local library

No. 4.2.4

Action: Build up a stock of biodiversity recording equipment such as bat detectors, moth traps, etc.

1.1.5. Kildare Pollinator Action Plan[10]

In 2020, a series of workshops were facilitated by Dr Mary O'Connor, ecologist with the various service departments to ascertain actions that are been taken and could be taken for the benefit of pollinators in Kildare during the course of normal work practice of the Council. Through these workshops the vision for the Kildare Pollinator Action Plan (KPAP) along with 8 goals, objectives and actions were developed. The vision for the Kildare County Council Pollinator Plan is: 'A Pollinator Friendly Kildare.' A flower rich and biodiverse Kildare supporting healthy and sustainable pollinator populations and benefitting our local communities and economy.

1.1.5.1. Goals of the Kildare Pollinator Action Plan

The KPAP contains eight main goals and under each goal is a series of objective and actions proposed to address these objectives. The All-Ireland Pollinator Plan Partner Framework is a five-year road map (2021-2025)[11] with 186 actions across 6 objectives. At the end of each year a report will be prepared on the actions completed.

- **Goal 1**: Include the protection of pollinators and their habitats in strategies and plans.
- **Goal 2**: Protect pollinators and their habitats.
- **Goal 3**: Alter the frequency of mowing.
- **Goal 4**: Encourage pollinator friendly planting.
- **Goal 5**: Provide nesting habitats for pollinators.
- **Goal 6**: Reduce use of pesticides and herbicides.
- **Goal 7**: Increase awareness of pollinators.
- **Goal 8**: Record and map actions for pollinators.

1.1.6. Newbridge Tidy Towns' Biodiversity Actions

Newbridge Tidy Towns have implemented a number of the objectives in the Newbridge Biodiversity Action Plan 2021-2025, some are ongoing and being developed over a longer period and others are being actively pursued, Examples of projects which have been carried out by Newbridge Tidy Towns are listed below.

[10] Kildare Pollinator Action Plan 2019 2022.pdf (kildarecoco.ie)

[11] https://pollinators.ie/aipp-2021-2025/

- Day-to-day maintenance & upkeep of the Green Flag for Parks accredited Liffey Linear Park is a core Tidy Towns project & as part of that project we have completed many biodiversity projects including but not limited to: -
    - Maintenance of a wildflower meadow.
    - Retention of immediate riverbank areas in their natural state, other than limited areas required for park visitors to safely access the river for recreation purposes.
    - Creation & maintenance of “short-cut” meadow.
    - Semi-mature tree planting & follow-up tree maintenance projects.
    - Fruit orchards have been developed using heritage Irish apple varieties & other fruit trees.
    - Suitable wildflower seeds & bulbs have been planted – such as Cowslip, Yellow Rattle, Spring Crocus, Grape hyacinth (Muscari), Ramsons & other perennial plants in a number of locations.
    - Ceased using weedkiller of any kind in the Linear Park or any other location in the town.
    - Installed bat boxes (working with Kildare Bat Group) & Barn Owl boxes (working with Kildare Birdwatch).
- Working with a number of residents associations & other groups around the town has resulted in bulb planting projects, semi-mature tree planting projects, no-mow May & meadow projects, fruit tree planting projects, pollinator friendly planting projects etc.
- Created a number of perennial planting “bed” projects at Athgarvan junction, Moorefield Road, Station Road & other locations.
- Working with the Council on perennial planting projects on Cutlery Road & ceased using moss peat in all our flower planting projects within the town etc.
- Swift boxes installed in conjunction with Wild Kildare.

1.1.7. Wetlands / Water dependant habitats

There are twenty wetland sites located within a 5km radius of Newbridge study area. Two wetland sites lie within the study area of Newbridge: School Wood (WMI_KE72) and Greatconnell WMI_KE71. See Table 1.2 below for details of wetland sites within the vicinity of the study area[12].

Pollardstown Fen SAC (site code: 000396) and Mouds Bog SAC (site code: 002331) are the only 2 European sites associated with wetlands in the vicinity of the project. The Curragh (Kildare) proposed Natural Heritage Area is located ca. 1.2km to the south of the study area.

[12] Source: Wetlands Survey Ireland – *Map of Irish Wetlands:* - https://wetland.maps.arcgis.com/apps/View/index.html?appid=e13b75c3bcab4932b992aa0169aa4a32&extent=-12.6266,51.3236,-3.2168,55.4102

Table 1.2 - Wetlands within a 5km radius of Newbridge study area.

Site Name	Site Code	Distance from Newbridge study area (over land)	Hydrologically connected to LAP?	Wetland type	Description
Newbridge School Wood	WMI_KE72	Within	Yes- Liffey River	Riparian Woodland, River	This is a small riparian woodland in Co. Kildare, part of which is on a small island. Lots of large willow (*Salix* spp.) and alder (*Alnus glutinosa*) occur, but the canopy cover is occasionally patchy.
Greatconnell	WMI_KE71	Within	No	Wet woodland (Oak, Ash or Willow Alder)	This small wood is located on a flood plain, the soil at the site is a stagno humic gley. The canopy at the site comprises ash (*Fraxinus excelsior*), alder, birch (*Betula pubescens* and *B. pendula*) and oak (*Quercus robur* and *Q. petraea*).
Mouds Bog SAC	WMI_KE4	Ca. 0.8km	No	Raised Bog, Cut over Bog	The site comprises a raised bog that includes both areas of high bog and cutover. Much of the margins of the site are bounded by trackways.
Liffey Bank above Athgarvan pNHA – River Liffey (Kildare)	WMI_KE41	Ca. 1.8km	Yes- Liffey River	Scrub, Wet grassland, River	On one of the meanders above Athgarvan, the Liffey has cut into a very sandy patch of boulder clay, steepening its banks beyond the point where a continuous vegetation can exist. The resulting unstable sandy slope faces south and is colonised by an interesting flora characteristic of unstable soil.
Rathcor Spring – Grand Canal pNHA	WMI_KE63	Ca. 1.8km	No	Reed Swamp, Canal, Artificial Pond, Calcaerous Spring, Scrub	Strongly flowing spring which feeds the Corbally Branch of the Grand Canal. Spring discharges into stone faced basin with fine calcareous mud on base and a central island to allowed for the past turning of barges. Little aquatic vegetation in water with exception of *Callitiche* patches.
Pollardstown Fen SAC	WMI_KE73	Ca.1.8km	No	Alkaline Fen, Cladium Fen, Calcareous Spring	Largest remaining spring–fed fen in Ireland. Habitats include semi–natural fen, damp grassland, woodland, and open water. The fen supports an important assemblage of invertebrate fauna. RAMSAR site.

Site Name	Site Code	Distance from Newbridge study area (over land)	Hydrologically connected to LAP?	Wetland type	Description
Pollardstown Wood, Pollardstown Fen SAC	WMI_KE73	Ca. 1.9km	No	Wet woodland (Oak, Ash or Willow Alder), Calcareous Spring	A small ash (*Fraxinus excelsior*) and alder (*Alnus glutinosa*) woodland with a stream and numerous ditches within it. This site borders Pollardstown Fen. There were calcareous springs within the wood.
Curragh (Kildare) pNHA	WMI_KE25	Ca. 2.2km	No	Marsh, Acid Lake, Scrub, Wet heath, Wet grassland,	Small areas of wet heath are found throughout the site, but especially west of the racecourse. Associated with the wet heath, but also occurring elsewhere, are semi-permanent pools supporting oligotrophic vegetation.
St. Patrick's Well	WMI_KE56	Ca. 2.5km	Yes- Liffey River	Calcareous Spring	This warm spring 5km west of Naas is almost completely covered by a holy well chamber, which was originally built in 1938 and later restored in 2004.
Blacktrench	WMI_KE89	Ca. 2.8km	No	Wet grassland, Tall herb swamp	Wet grassland site.
Kineagh	WMI_KE166	Ca. 2.9km	No	Artificial Pond, Eutrophic Lake, Wet Grassland	Wet grassland field heavily poached and grazed by cattle. Rushes in field had recently been topped. Small pond at western end which is not fenced and used as cattle watering hole. Bare mud edge and heavily disturbed.
Curragh (ED Ballysax East Pond – Curragh Kildare) pNHA	WMI_KE164	Ca. 3.2km	No	Artificial Pond, Eutrophic Lake, Wet grassland	Depression in landscape occupied by small eutrophic pool with *Juncus effusus* dominated wet grassland in hollow and marginal acid grassland. Hollow likely to flood in winter. Area heavily poached and disturbed by sheep.
Ballysaxhills Farm Pond	WMI_KE163	Ca. 3.3km	No	Artificial Pond, Eutrophic Lake	Site consists of a small farm pond in field at the edge of the Curragh, at Waverley Cottages. The pond has no marginal vegetation and consists of a bare soil area created by a drop in water level and the effects of sheep accessing the site to drink.

Site Name	Site Code	Distance from Newbridge study area (over land)	Hydrologically connected to LAP?	Wetland type	Description
Ballysax Great	WMI_KE125	Ca. 3.5km	No	Artificial Pond	This is an artificial pond with two small islands with birch and gorse. There is good diversity of waterfowl present.
Jigginstown Lake	WMI_KE238	Ca. 3.8km	No	Artificial Pond, Mesotrophic Lake, Reed Swamp	Large open water lake with modified edges comprising steep embankments with gorse scrub. Site used for water skiing. Sparse wetland flora with narrow *Phragmites* fringe in places. *Potamogeton* spp. occurs across lake surface.
Ballysaxhills	WMI_KE144	Ca. 3.9km	No	Wet grassland	Former wetland now drained and reverted to improved agricultural grassland and wet grassland. Some small areas of impounded water with rushes remain but no longer a functioning wetland.
Ballysax Great Quarry	WMI_KE157	Ca. 4km	No	Artificial Pond	Abandoned sand and gravel quarry. Site includes an artificial pond which has been fenced. Pond has no marginal vegetation with Chara and *Potamogeton* occurring in water. Sand Martins utilise wetland feature and surrounding quarry walls for nesting.
Ballysaxhills Quarry	WMI_KE158	Ca. 4.1km	No	Artificial Pond	Based on aerial photographic examination and survey of other quarry sites, the site is likely to contain sparsely vegetated settlement ponds.
Corbally Branch, Grand Canal Stretch pNHA	WMI_KE239	Ca. 4.7km	No	Canal, Reed Swamp	Canal feeder which supplies water for the Grand Canal. The canal feeder has a narrow reed and large sedge border, with adjacent tow path dominated by grassland communities and scrub and hedgerows.
Corbally (Connelly by)	WMI_KE169	Ca. 4.8km	No	Artificial Pond	Large operating sand and gravel quarry. Silt ponds are used to treat discharge. No wetland interest. Sand Martins utilise wetland feature and surrounding quarry walls for nesting.

1.1.8. Projects within the Newbridge Study Area

1.1.8.1. Sources of Information

The following sources of information were consulted to gather information on other plans and projects: -

- Local authority development plans and their AA documents.
- Local authority online planning enquiries (Kildare County Council).
- EIA Portal (DHLGH, 2024).
- Floodinfo.ie (OPW, 2024).

1.1.8.2. Projects

Within the Newbridge study area, there has also been large developments approved including large housing developments (such as Curragh Farm (EIA Portal ID[13]: 2022011)) and significant industrial facilities (such as Diageo Brewery (EIA Portal ID: 2022208)). These developments have conditions attached to their planning permission relating to sustainable development, such as siting of septic tanks, foul surface water and effluent drainage facilities, and clean surface water run-off drainage facilities for domestic dwellings and waste water treatment facilities and for industries. Individual housing projects away from connectivity to public wastewater treatment system are required to comply with the EPA's *Code of Practice for Wastewater Treatment Systems for Single Houses* (EPA, 2009; 2018).

In addition, projects that have been granted planning permission include to improve recreational public and private open space, retention of existing developments, or the construction of new domestic dwellings in the form of individual structures or extensions to such dwellings.

1.1.8.3. Other activities

Farmers and landowners undertake general agricultural operations in areas within the Newbridge study area, which could potentially give rise to effects on the qualifying interests. Such operations are periodic, not continuous, and qualify as 'activities requiring consent' that require prior consultation with the NPWS, e.g., reclamation, infilling or land drainage within 30m of a river, removal of trees or any aquatic vegetation within 30m of a river, and harvesting or burning of reed or willow (NPWS, 2023a). Such operations must also comply with the European Communities (Environmental Impact Assessment) (Agriculture) Regulations, 2011 (as amended) in relation to: -

- Restructuring of rural land holdings,
- Commencing use of uncultivated land or semi-natural areas for intensive.
- Land drainage works on lands used for agriculture.

[13] https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1

1.2. Objectives and Outputs

The main objectives of this project were to: -

- Survey and map habitats to Level 3 of Fossitt (2000) classification.
- Evaluate the nature conservation value and identify likely threats to the ecological integrity of habitats surveyed. The evaluation criteria used was agreed in advance with Kildare County Council. Assess and map hedgerows individually, using a standard methodology agreed in advance with Kildare County Council.
- Identify and map flora species of conservation interest, potential habitat features of value to fauna, and invasive species.
- Identify, evaluate, and map the Green Infrastructure in the study area.
- Propose recommendations for future work
- Identify habitats that provided important ecosystem services or acted as ecological corridors or stepping stones within the town
- Identify 'Key Green Infrastructure area" with the town'
- Identify biodiversity resources to be identified for retention in the new LAPs.

The outputs of this project include: -

- A digital dataset (compatible with GIS MapInfo) of all habitat data. The data was stored in an excel database for future incorporation into the Kildare County Council GIS service.
- Colour maps identifying habitats, and separate map(s) identifying key green infrastructure (overlaid on aerial photograph(s). Production of thematic colour maps, based on an attribute value in the *.shp* or *.tab* file.
- A separate MapInfo table for each distinct spatial dataset generated in the study.
- MapInfo tables prepared in Irish National Grid coordinate system.
- Each spatial object (point, polyline, and polygon) in a table to have a Unique ID inside that table.
- MapInfo table containing data fields appropriate for recording of the particulars of that spatial dataset. If external databases are used to record data relating to spatial datasets, then each record must be linked by a key field to the unique ID in the MapInfo table.
- Concise summary of findings in *pdf* format.
- An electronic copy of final report in both Microsoft office word and *pdf* formats.
- Where appropriate any data collated on species of conservation interest and invasive species will be lodged with the National Biodiversity Data Centre (NBDC), or other relevant organisation, as per NBDC guidance on submitting records.
- One set of high-resolution digital images/photographs for each habitat and copyrighted to Kildare County Council.

1.3. Methods

The methods we used to meet the project objectives are briefly outlined in this section, with additional details given in Chapter 3 below. The first step was to carry out the habitat survey of the Newbridge study area. The *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al.*, 2011) provides advice on how to plan, carry out and use the results of a habitat survey project. According to this guidance, there are five main steps in a good habitat survey, which were followed for this project: -

1. Planning the survey in line with the survey objectives,
2. Reviewing information that already exists for the study areas,
3. Carrying out habitat survey and mapping in the field,
4. Compiling the results into a database, preparing habitat maps and writing the project report, and
5. Interpreting and using the results of the survey.

The survey was planned in conjunction with the Kildare County Council Planning Department. The areas to be covered by the survey are contained within the development boundary of Newbridge study area (Figure 1.1).

We reviewed information from previous studies on the habitats and biodiversity of the Newbridge study areas. These included previous habitat surveys, such as information collated in Environmental Impact Statements, and data from other studies. All information sources are outlined in Chapter 5. Where available, we incorporated digital habitat data into our habitat mapping GIS.

Prior to undertaking field survey work we used information from previous studies to prepare preliminary habitat maps using GIS. We brought these preliminary maps into the field along with Ordnance Survey Ireland (OSi) mapping and aerial photographs. We collected additional information on conservation value and threats on prepared data sheets. This information included whether the habitat corresponded with a habitat of European conservation importance as listed on Annex I of the EU Habitats Directive, if the habitat supported any rare species, threats to the habitat, and the presence of non-native invasive species. We also took photographs of habitats. We evaluated the nature conservation value of habitats according to the scale adapted by the National Roads Authority (NRA, 2009) and CIEEM (2018; updated 2022). These criteria have also been used for evaluating the nature conservation significance of important flora and fauna.

- International importance
- National importance
- County importance
- High local importance
- Low local importance
- Negligible importance

Detailed information on townland boundary and roadside hedgerows (Section 4.2) was also collated.

We combined our field survey data with existing habitat information into a GIS database (Box 1.3). We used this database to prepare habitat maps and to identify areas of Green Infrastructure.

Box 1.3: Geographical Information Systems.

The Newbridge habitat mapping data have been stored in a Geographical Information System (GIS) that was also used to analyse the data and produce the maps in this report. A GIS is a computer-based information system designed to store, process and manipulate geographical data. All habitats within the study areas have been mapped, and their locations and extent are stored in the GIS as two-dimensional shapes (polygons) or, for linear habitats like hedgerows or smaller streams, as lines. The real strength of a GIS, however, is that the habitat polygons and lines are also associated with information. This makes it easy to create maps colour coded by habitat type or conservation value, as this information is stored in the GIS data table. Each row within the table is an individual habitat polygon, and each column corresponds to variables such as habitat type, area, survey date, and conservation value. Data within the table can be quickly analysed to find out important facts about Kildare's habitats. For example, the total area that different habitat types occupy within the Newbridge study area was determined for this report using the GIS database.

2. Newbridge

2.1. Overview

The town of Newbridge is located on the River Liffey on the north-eastern fringe of the Curragh located some 36km west of Dublin. Newbridge has a history rich in early Christian settlement dating from the 12th Century. Newbridge is made up of six ancient parishes and portions of others including Ballymany, Carnalway, Great Connell, Killashee, Morristown Billar and Old Connell. Newbridge was established as a garrison town in the early 1800's and continued to grow from the garrison ground toward the north (Newbridge Local Area Plan, 2003). The area has a strong industrial background with industry such as rope and carpet making dating back to the early 1930's whilst more recently Newbridge has become associated with silverware and jewellery.

Like most towns in Kildare, Newbridge is located within the commuter belt serving the greater Dublin area and has resulted in an increase in residential development over the past 10 to 15 years. Nonetheless, like many County Kildare towns, the outer fringes of Newbridge are dominated by agricultural pastureland, bounded by hedgerows and treelines. Indeed, improved agricultural grassland is the most dominant habitat in this Kildare town reflecting the large tracts of agricultural pastureland associated with the study area.

The River Liffey forms one of the main ecological features within the Newbridge study area. In addition to the main channel of this large depositional watercourse, the many adjoining habitats such as semi-natural woodland, tall herbs swamps, treelines, tributaries, drainage ditches and adjoining areas of semi-natural grassland represent a considerable ecological network around which the town has developed.

Other ecologically important sites within the Newbridge study area includes the Curragh which is located on the south-western fringes of the town and Pollardstown Fen; situated on the town's north-western fringes. Both of these sites are of considerable ecological importance and are designated for nature conservation at International and national levels, respectively. These important biodiversity areas are described in greater detail below as part of Newbridge's Green Infrastructure Network.

Figure 2.1 presents a habitat map of habitats within the Newbridge study area. Figure 2.2 presents the key linear features within the Newbridge study area. These figures can be found at the end of Section 2.

2.1.1. Buildings and Gardens

This category includes areas of built land (BL3), e.g. private dwellings, public premises, roads, car parks and industrial areas, in addition to gardens, lawns, flower beds and ornamental shrubs. Obviously, these habitats were most abundant toward the eastern and central parts of the Newbridge study area. The more built-up areas, such as large retail units, car parks and roadways, provide little or no biodiversity value and they have been evaluated in their current condition as being of little ecological significance.

We have also captured new residential developments, some of which are still under construction at the time of writing, in Bellin Woods, Ballymany, Morristownbiller and Roseberry Hill. The balance of habitats in these areas may change somewhat over time as landscaping on these sites is completed.

Plate 2-1 – Residential buildings in Newbridge Town (2024).

Old buildings are of particular importance to bats, as they provide roosting space in attics and crevices. Bats require buildings with crevices or small holes into which they can crawl, which tend to be more common in older than in newer buildings. In addition, roosting or hibernating bats are sensitive to changes in temperature, and the temperature of old stone buildings often fluctuates less than that of buildings made of more modern materials. Due to declines in bat populations across Europe, all bat species are protected under Irish and EU law. Repointing crevices in old stone walls and bridges with mortar or concrete risks the loss of roosting space for bats, or worse, can entomb any bats that may be hiding within.

Although the majority of plant species found in estates and suburban gardens are planted, non-native species, these areas can still be of local importance for birds, insects and to a lesser extent small mammals. The more mature estates and suburban houses are of greater benefit, as the larger trees and denser shrubs and garden hedges provide greater cover and foraging opportunities for wildlife. Older flower gardens tend to be more diverse, providing a wider range and longer availability of nectar for butterflies, bees, moths and other insects. In such circumstances non-native flowering species can often be beneficial for insects, which in turn provide a food source for birds. The older housing estates are good examples of established mature houses that are of good local value for biodiversity. Such estates often support a greater range of plant types and structural diversity, which in turn supports a richer diversity of bird species than the newer estates. The value of gardens is further enhanced by the increasingly popular practice of winter feeding of birds. BirdWatch Ireland runs a national survey of garden birds which monitors garden bird numbers and diversity in Ireland.

In Ireland, however, most estates have enclosed / walled gardens preventing the easy movement of small mammals, such as e.g. hedgehog through the landscape. This fragments the landscape for many Irish mammals and reduces the value of garden habitats. In contrast species such as Grey Squirrel which can climb, can easily access gardens and increasingly feed at garden bird feeders.

The main threat to the ecological interest of buildings and gardens is inappropriate management. Biodiversity can be beautiful, but not always: scruffy, weedy corners of gardens or neglected parts of estates are often of higher ecological interest than well-manicured lawns. Nettle for example is a food plant for a number of butterfly species, including Peacock (*Inachis io*) and Small tortoiseshell (*Aglais urticae*). Clearing these unsightly areas removes habitats for wild, weedy plants, like bramble and common ragwort, and the invertebrates and birds they support. Diversifying the structure and composition of gardens, such as replacing lawns with flower beds or flowering shrubs, can enhance local biodiversity. Other threats to the natural heritage of built land and gardens include dumping of household waste and the spread of non-native invasive plants such as Japanese Knotweed and butterfly bush.

Plate 2-2 - Buildings and gardens in Newbridge Town (2024).

Plate 2-3 – Built land in Newbridge Town (2024).

2.1.2. Grassland

2.1.2.1. Improved agricultural grassland (GA1)

The outskirts of the Newbridge Town area is dominated by improved agricultural grassland (GA1) habitat that mostly supports dairying and beef cattle. The majority of these habitats are of little ecological value, particularly the improved grassland pastures that are dominated by swards of perennial rye grass. Most of these habitats

are bordered by hedgerows of varying condition that oftentimes provide the only areas of semi-natural habitat within an otherwise intensively managed landscape. Although of limited value for biodiversity, intensive agriculture can provide useful ecosystem services, primarily food production, but also water regulation and carbon sequestration. The most recent threats to these habitats include abandonment and loss to development of e.g. housing estates, industrial estates and roads.

Plate 2-4 - Improved agricultural grassland in the northern area of Newbridge Town (2024).

2.1.2.2. Amenity Grassland (GA2)

Like improved agricultural grassland, areas of improved amenity grassland (GA2) are of limited ecological value. This category includes the larger public and private lawns found in housing estates and institutional grounds (see Plate 2-3). (Strictly speaking, smaller lawns are also included in this category, but we have included most small lawns in the buildings and gardens category, as due to their smaller size they form a more intimate mosaic with buildings and flower beds). They are dominated by a small number of grasses, mainly perennial ryegrass, and red fescue and support only a limited range of broadleaved weed species, such as dandelions, white clover and daisies. Amenity grasslands are maintained by regular mowing with frequent use of fertilisers and herbicides.

Some amenity grasslands may be regularly reseeded, and conversion to improved amenity grassland is a threat to more diverse semi-natural habitats, especially dry grassy verges. Inappropriate disposal of grass cuttings can be an issue where suburban gardens adjoin areas of semi-natural habitat.

Plate 2-5 - Amenity grassland located near Old Connell Weir (2024).

2.1.2.3. Dry Calcareous and Neutral Grassland (GS1)

Dry calcareous and neutral grassland (GS1). This category is used for unimproved or semi-improved dry grassland that may be either calcareous or neutral, but not acid. It is associated with low intensity agriculture and typically occurs on free-draining mineral soils of various depths. Calcareous grassland is restricted in its distribution and is now largely confined to the steep slopes of esker ridges and moraines in the midlands, and to other areas with shallow and rocky limestone soils. Management and fertiliser use makes calcareous grasslands more like neutral grasslands in character and these have a wider distribution. Most old permanent pastures and less intensively managed lowland grasslands fit into this category. This habitat is found in small patches in the northern section of the study area.

Plate 2-6 - Dry calcareous grassland located near Littleconnell (2024).

2.1.2.4. Dry Meadows and Grassy Verges (GS2)

Dry meadows that are rarely fertilised or grazed and are mown only once or twice a year for hay are now rare in Ireland. Most have been improved for agriculture and this type of grassland is now best represented on grassy roadside verges, on the margins of tilled fields, on railway embankments, in churchyards and cemeteries, and in some neglected fields or gardens. These areas are occasionally mown (or treated with herbicides in the case of some railway embankments), and there is little or no grazing or fertiliser application.

This habitat is also found in small patches throughout the Newbridge study area.

Plate 2-7 - Dry meadow and grass verges located near eastern boundary of Newbridge Town (2024).

2.1.2.5. Wet Grassland (GS4)

This type of grassland can be found on flat or sloping ground in upland and lowland areas. It occurs on wet or waterlogged mineral or organic soils that are poorly-drained or, in some cases, subjected to seasonal or periodic flooding. On sloping ground, wet grassland is mainly confined to clay-rich gleys and loams, or organic soils that are wet but not waterlogged.

This habitat is recorded in several patches within the Newbridge study area, with the largest area adjacent to Rosconnell Road and Richardstown Road.

2.1.3. Cultivated Land (BC)

2.1.3.1. Arable Crops (BC1)

Arable crops (BC1) is agricultural land that is cultivated and managed for the production of arable crops, including cereals (wheat, barley, oats, maize), and root, leaf, energy or fibre crops such as sugar beet, turnips, rapeseed and flax. Fields of potatoes can be included here, but most other vegetable crops are excluded, as are market gardens. Arable crop fields are located in pockets along the borders of the Newbridge study area.

Plate 2-8 - Arable crop land to the east of Lidl Distribution Centre (2024).

2.1.3.2. Horticultural Land (BC2)

This category includes areas of land that are cultivated and managed for the production of vegetables, fruit crops, culinary or aromatic herbs, flowers and other ornamental plants. It should also be used for market gardens, tree nurseries, garden centres, greenhouses, polythene tunnels and smaller vegetable plots in gardens and allotments. Note that potatoes, turnips and other agricultural, energy or fibre crops are excluded.

Horticultural Land is recorded west of Newbridge United Chapel Lane soccer pitch.

2.1.4. Disturbed Ground (ED)

The disturbed ground habitat group includes areas that have been disturbed in the recent past by human activity, such as construction; Spoil and Bare Ground (ED2) and Recolonising Bare Ground (ED3) refers. Large areas of bare soil are typical of recently disturbed ground. Older patches support a diverse community of weeds and other “fugitive” plant species that need disturbed ground for their seeds to germinate. Typical plants of

disturbed ground include thistles, docks, annual meadow grass, common ragwort, charlock, poppies and scarlet pimpernel. The diversity of flowering plants means that recolonising disturbed ground habitats can be important habitats for insects, such as butterflies and bees. Patches of bare soil are important as basking areas for invertebrates and for burrowing insects, such as solitary bees.

If left alone, patches of disturbed ground will develop into semi-natural grassland and scrub. However, disturbed ground associated with construction is often converted into ecologically dull amenity grassland when construction activities are finished. Many areas of bare ground can also support a range of non-native species including invasive species such as Japanese Knotweed, butterfly bush, winter heliotrope.

Plate 2-9 - Disturbed ground at Littleconnell, large scale construction taking place behind grassland (2024).

2.1.5. Watercourses

2.1.5.1. Depositing Lowland Rivers (FW2)

This category includes watercourses, or sections of these, where fine sediments are deposited on the riverbed. Depositing conditions are typical of lowland areas where gradients are low and water flow is slow and sluggish. These rivers vary in size but are usually larger and deeper than those above. In a natural state these rivers erode their banks and meander across floodplains. Because of this, most have been modified to some extent to control water flow, facilitate navigation or prevent flooding and erosion. Canalised or walled sections of rivers are included here, as are natural watercourses that have been dredged or deepened, and those with artificial earth banks.

The River Liffey flows through the centre of the Newbridge study area, in a northerly direction.

Plate 2-10 - River Liffey adjacent to the R416 (2024).

Plate 2-11 - River Liffey flows through the Newbridge study area (2024) and Canals (FW3).

Canals are artificial linear bodies of water that were originally constructed for the purpose of navigation. They typically lack strong currents and any significant channel or instream vegetation such as *Water-crowfoot Ranunculus* sp. (R. T. Mills) or bank erosion. This means that canals tend to have closer affinities with ponds than rivers.

A small canal is recorded leading from the River Liffey back to the river ca. 500m downstream.

2.1.5.2. Drainage Ditches (FW4)

Drainage ditches are linear waterbodies or wet channels that are entirely artificial in origin, and some sections of natural watercourses that have been excavated or modified to enhance drainage and control the flow of water. Drainage ditches are not used for navigation and are typically narrower than canals with water levels undergoing seasonal changes.

A drainage ditch ca. 1.1km long flows through Millfield in an easterly direction before joining the River Liffey.

2.1.6. Hedgerows and Treelines (WL1 / WL2)

Hedgerows are most common in the outer sections of the study area bordering habitats utilised for intensive agricultural purposes. In most other areas hedges have been removed. The structure of extant hedgerows varies considerably and is strongly influenced by past or ongoing management practices, such as cutting, replanting and fencing. Shrub species composition tends to vary, but the more commonly recorded species include hawthorn, elder and blackthorn. Frequently occurring tree species include ash, sycamore, beech, oak and elm. In many instances, hedgerows have been left unmanaged over the long term, and the maturation of the trees and shrubs results in a transition from a tightly planted hedgerow to a gappy hedgerow and treeline structure. Other hedgerows of better structural condition support a continuous line of tightly planted and stock proof shrub species, mainly hawthorn. However, hedgerows exhibiting this structure were greatly reduced or entirely absent from some areas.

In many instances, hedgerows provide valuable conduits and corridors for small mammals and other animals throughout the Newbridge study area. Many bat species in particular use hedgerows and treelines as commuting routes to guide them to and from roosts and feeding areas.

Hedgerows are also of significant habitat value themselves, particularly in places where woodland is uncommon. Well-developed hedgerows can support a range of plant species typical of open woodland and woodland edges, including herb-robert, primrose and false wood brome. Dense hedgerows provide important nesting space for birds, and hedgerow fruits, including elder, bramble and hawthorn, are an important food resource. Some degree of grazing at the base of the hedgerow may be beneficial by keeping competitive species, such as bramble, in check and creating patches of disturbed soil for solitary bee nesting. Hedgerows and hedge banks provide space for burrows for mice and rabbits, and entrances to badger setts are frequently hidden in hedgerows. The protection of buffer zones / headlands along the base of hedges should be encouraged to promote biodiversity.

Threats to hedgerows include lack of long-term management, fragmentation by construction and infrastructure development and removal.

Many of the hedges around Newbridge Town are heavily box-cut (Plate 2-9). In contrast there is hedges adjacent to the main roads, which are a mix of hedge (WL1), as well as sections more typical of treelines (WL2) (Plate 2-10).

Mature treelines (WL2) are also present within Newbridge; often associated with public lands, running along roads farm holdings and farmyards. These are generally planted in lines with no associated shrubs or understorey vegetation. In many cases hedgerows originate on raised banks of earth that are often derived from the excavation of associated drainage ditches. Where they occur, both the bank and the ditch can add to the biodiversity value of the hedgerow by increasing the diversity of niches available for plants and animals.

While all hedges and treelines are an important component of green infrastructure within Newbridge, their current ecological value can range from low local to high local ecological value (NRA, 2009). Current ecological value is informed by factors such as structural complexity, species richness, condition, and management history. This can also inform opportunities for enhancement. Additional features such as banks and associated ditches further enhance their biodiversity value. Their value to cultural heritage should also be noted, e.g. as townland boundaries. While initial mapping of the location of treelines and hedges has been undertaken, a detailed study of treelines and hedges and categorisation of their value was outside the scope of this study.

When proposing to develop a site the mitigation hierarchy should be followed. The first objective should be to avoid removal of hedges / treelines where practical. To inform decision making an ecologist should be consulted early in the design process such that identified ecological constraints can inform the evolution of the

project design. This will become increasingly important as the concepts of Biodiversity Net Gain and No Net Loss become more central to the concept of ecologically sustainable development.

Where it is not possible to avoid all loss of hedges the developer shall be required to provide a detailed landscape planting scheme, maximising the use of native species as appropriate to the scheme and its location. The landscape architect should work closely with an appropriately qualified ecologist in designing such a scheme. Consideration must also be given to the time it may take for such planting to fully replace the ecological value of and functionality of what is to be lost.

Plate 2-12 - Box-cut hedgerow along Connell Drive.

Plate 2-13 - Treeline and Hedgerow located in the north-western corner of the study area.

2.1.7. Scrub (WS) and Woodland (WD/WN)

Immature woodland (WS2) was identified in one area along the Newbridge bypass. This habitat includes areas that are dominated by young or sapling trees that have not yet reached the threshold heights (5 m, or 4 m in the case of wetland areas) for inclusion in the woodland categories previously described.

Scrub (WS1) was identified in two isolated parcels throughout the Newbridge study area. Due to the intensive nature of the farming practices and the dominance of urban and suburban habitats, scrub in the Newbridge study area is notably reduced in area relative to many other parts of Ireland. In the main, the scrub habitats occur as isolated pockets on areas of abandoned or unmanaged grasslands that have been colonised by bramble. Species recorded within scrub include bramble, hawthorn, blackthorn, elder with semi-mature sycamore and ash.

Woodland is also scarce in the immediate environs of Newbridge Town. Sections of Wet Willow Alder Ash Woodland (WN6) was identified along the River Liffey bank throughout the middle extent of the River Liffey through the study area. This broad category includes woodlands of permanently waterlogged sites that are dominated by willows (*Salix* spp.), Alder (*Alnus glutinosa*) or Ash (*Fraxinus excelsior*), or by various combinations of some or all of these trees. It includes woodlands of lakeshores, stagnant waters and fens, known as carr, in addition to woodlands of spring-fed or flushed sites.

Riparian Woodland (WN5) was also identified along the banks of the River Liffey. This category includes wet woodlands of river margins (gallery woodland) and low islands that are subject to frequent flooding, or where water levels fluctuate as a result of tidal movement (in the lower reaches of rivers). Riparian woodland is dominated by stands of willows that may include native (*Salix cinerea, S. purpurea, S. triandra*) and non-native (*Salix fragilis, S. alba, S. viminalis*) species. Alder (*Alnus glutinosa*) is occasional. The field layer is characterised by broadleaved herbs such as Nettle (*Urtica dioica*), Creeping Buttercup (*Ranunculus repens*), Wood Dock (*Rumex sanguineus*), Meadowsweet (*Filipendula ulmaria*), Wild Angelica (*Angelica sylvestris*), Hemlock Water-dropwort (*Oenanthe crocata*) and Hedge Bindweed (*Calystegia sepium*). Stands of Reed Canary-grass (*Phalaris arundinacea*) are common. Indian Balsam (*Impatiens glandulifera*), an introduced species, is locally abundant.

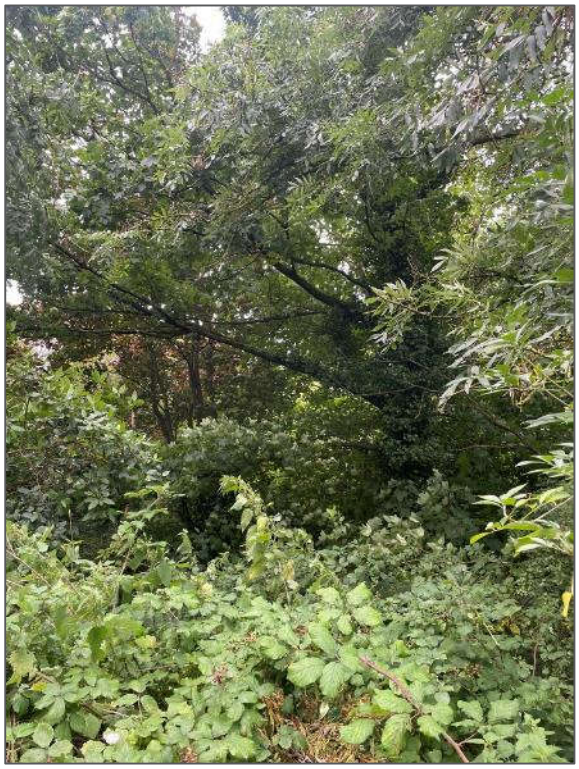

Plate 2-14 - Scrub located near Newbridge College (2024).

Plate 2-15 - Riparian woodland along the banks of the River Liffey (2024).

(Mixed) broadleaved woodland (WD1) occurs throughout the Newbridge study area in small sections, with the highest instance of this habitat in the northeast section. In general, this category includes woodland areas with 75-100% cover of broadleaved trees, and 0-25% cover of conifers. Plantations of broadleaved trees are included if the canopy height is greater than 5 m, or 4 m in the case of wetland areas. Areas of mixed broadleaved/conifer woodland (WD2) also occurs in a single area close to the Pfizer plant to the north of Newbridge Town. This category includes woodland areas with mixed stands of broadleaved trees and conifers, where both types have a minimum cover of 25%, and a maximum of 75%. Trees may be either native or non-native species. Mixed broadleaved/conifer plantations are included if the canopy height is greater than 5 m, or 4 m in the case of wetland areas.

Conifer plantation (WD4) is present to the northeast of the study area in a single large section. This category is used for areas that support dense stands of planted conifers where the broadleaved component is less than 25% and the overriding interest is commercial timber production. Conifer plantations are characterised by even-aged stands of trees that are usually planted in regular rows, frequently within angular blocks. Species diversity is low and single species stands are common. The majority of planted conifers are non-native species such as Sitka Spruce (*Picea sitchensis*), Lodgepole Pine (*Pinus contorta*), Norway Spruce (*Picea abies*) and larches (*Larix* spp.)

There are two identified areas of scattered trees and parkland (WD5) within the Newbridge study area; within the environs of Gaelscoil Chill Darra and Newbridge's Educate Together National School and to the north within a large stud farm. This category can be used in situations where scattered trees, standing alone or in small clusters, cover less than 30% of the total area under consideration but are a prominent structural or visual feature of the habitat. This usually occurs in areas of cultivated grassland, particularly amenity areas. In the case of parkland or parks which originate from former planting and landscaping, the proportion of non-native trees is typically high.

2.1.8. Artificial Lakes and Ponds (FL8)

Ponds and lake represent important features in the landscape. There is one artificial pond located in Piercetown Park. This category should be used for artificial or ornamental bodies of standing water that may be found in parks, demesnes, gardens or golf courses. Flooded quarries, tailings ponds and water treatment plants (with open water) should also be included. The nutrient status of these artificial water bodies is variable and may be high as in the case of hypertrophic lakes in urban parks. Moats can also be included here if there is no obvious connection to a wider drainage network.

2.1.9. Tall Herb Swamp (FS2)

Tall-herb swamps are comparatively species-rich stands of herbaceous vegetation that occur in wet areas where the water table is above the ground surface for most of the year, or where water levels fluctuate regularly as in the case of tidal sections of rivers. Tall or robust broadleaved herbs dominate, and common components include Lesser Water parsnip (*Berula erecta*), Fool's Water-cress (*Apium nodiflorum*), Gipsywort (*Lycopus europaeus*), Brooklime (*Veronica beccabunga*), Hemlock Water-dropwort (*Oenanthe crocata*), Hemp-agrimony (*Eupatorium cannabinum*) and Water Forget-me-not (*Myosotis scorpioides*). These swamps may also support Yellow Iris (*Iris pseudacorus*), Water-plantain (*Alisma plantago-aquatica*) and Water Horsetail (*Equisetum fluviatile*), in addition to occasional reeds, large grasses (*Glyceria maxima, Festuca arundinacea*) and sedges.

Tall herb swamp habitat has been recorded in the centre of the Newbridge study area along the banks of the Liffey, in small sections.

2.1.10. Invasive Plant Species

As mentioned, Japanese Knotweed (*Fallopia japonica*) and Himalayan Balsam (*Impatiens glandulifera*), which are Third Schedule plants, were recorded within the 10km grid square N81, which encompasses the eastern side of the study area. Japanese Knotweed (*Fallopia japonica*) is recorded in the 10km grid square N71 which encompasses the western side of the study area. Other invasive species which are not legally restricted recorded within the 10km grid squares include Butterfly-bush (*Buddleja davidii*), Cherry Laurel (*Prunus laurocerasus*), Sycamore (*Acer pseudoplatanus*), Three-cornered Garlic (*Allium triquetrum*), Japanese Rose (*Rosa rugosa)* and Pitcherplant (*Sarracenia purpurea*) were also recorded within the Newbridge Study Area.

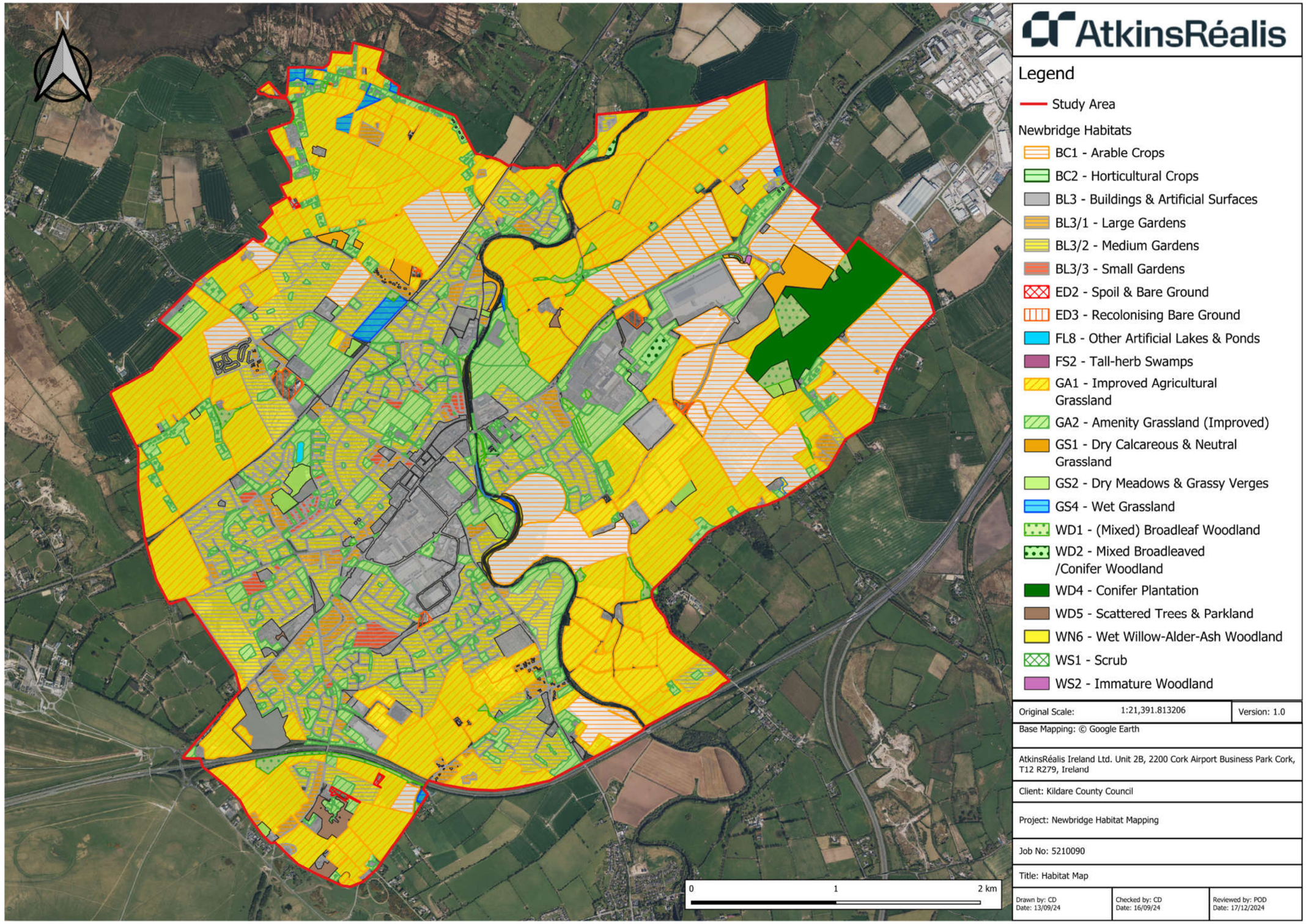

Figure 2.1 – Habitats within Newbridge study area (Source: Google Maps).

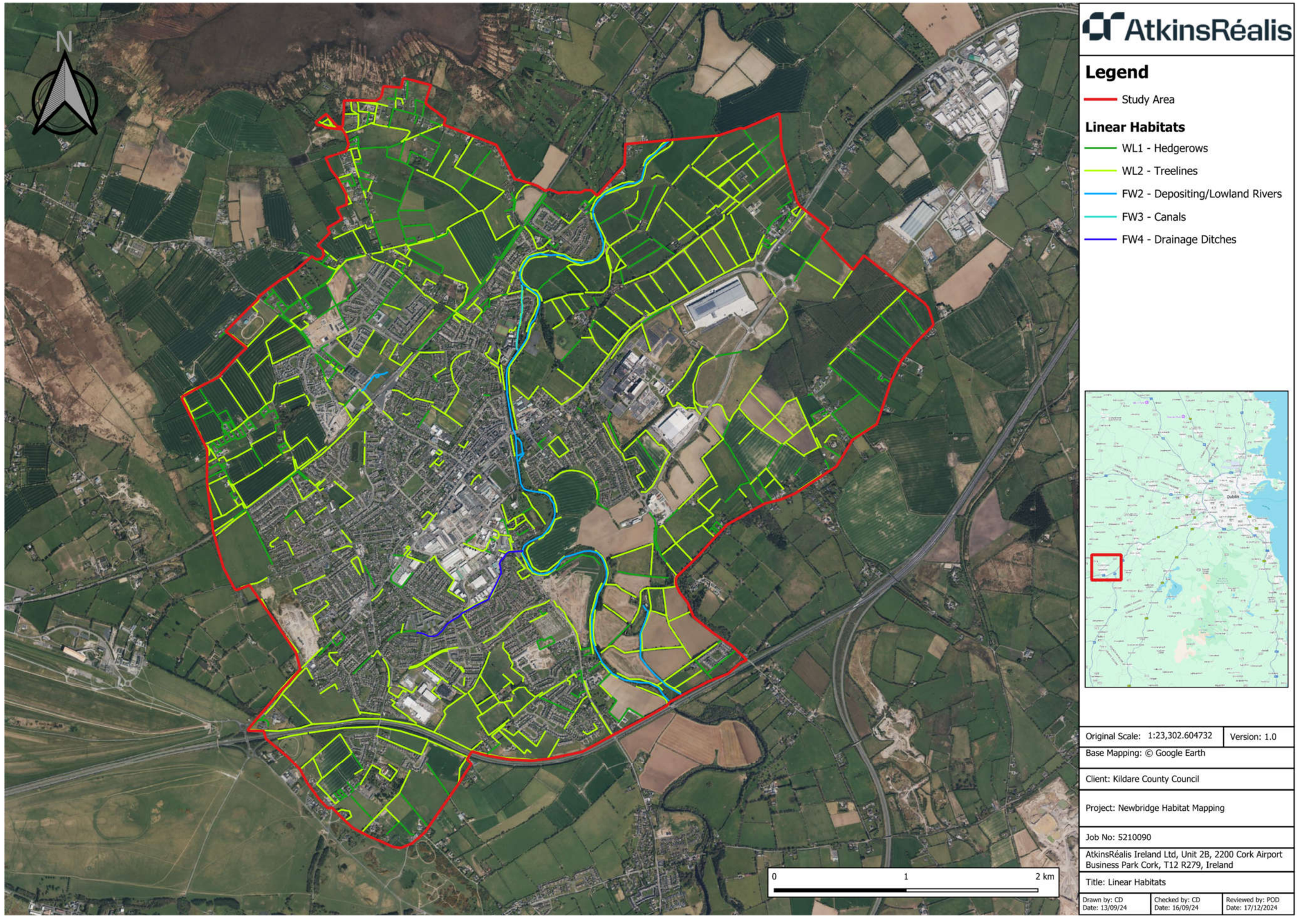

Figure 2.2 – Key linear habitats within Newbridge study area (Source: Google Maps).

3. Green Infrastructure

3.1. Defining Green Infrastructure in Newbridge

Central to the concept of Green Infrastructure is multi-functionality: i.e. the provision of a number of ecosystem services. Not all pieces of Green Infrastructure perform the same functions, however, and not all are of equal value. The grassy strip between a footpath and the road surface provides some water regulation services by providing a green space for excess water to soak into, and it also provides a very limited habitat for plants and insects. On the other hand, a riparian wetland would have a much greater capacity to absorb water and would support a much greater range of biodiversity. In order to be useful, any project identifying Green Infrastructure must recognise these differences in value and distinguish what are the most important components. This was our main objective and challenge in preparing this report.

We initially looked at habitats that we evaluated as being of Low Local importance for nature conservation or greater. However, this resulted in too many areas being identified as potential Green Infrastructure to be useful. We then looked at habitats of High Local importance or greater, but this resulted in too few areas identified and also overlooked the other ecosystem services provided by Green Infrastructure. We settled on a phased approach using High Local importance habitats as a starting point and adding other habitats and habitat complexes that provided important ecosystem services or acted as ecological corridors or stepping stones. These areas we identified as key Green Infrastructure, and these are named and discussed in more detail below and are mapped in Figure 3.1.

The criteria we used for identifying key Green Infrastructure were: -

- Habitats of High Local conservation value or greater
- Adjacent habitats of lower conservation value that together form a coherent habitat complex[14] or that buffer the higher importance areas
- Habitats of Low Local conservation value that perform another significant ecosystem service, such as amenity, water regulation or carbon sequestration
- Habitat corridors or stepping stones of Low Local conservation value in an area surrounded by and dominated by habitats of negligible ecological value

In addition to the key Green Infrastructure areas, we also mapped two other types of Green Infrastructure that are of less ecological importance: namely agricultural land and amenity grasslands (Figure 3.1). Agricultural land is mapped for its food production value. Amenity grassland can be of significant recreational and passive amenity value and, in urban situations where hard surfaces are abundant, can assist with surface water drainage; it may also be appropriate to manage some amenity grasslands or parts of them to improve their benefits for biodiversity. Figure 3.1 displays the key ecological Green Infrastructure areas together with amenity grassland / recreational areas within the Newbridge study area.

[14] A coherent habitat complex for the purpose of this study is a group of habitats united by one or more common ecosystem or management features. Examples include woodland, scrub and hedgerow forming a wooded habitat complex; wet woodland, marsh and wet grassland forming a wetland complex; or scrub, semi-natural grassland and abandoned agricultural grassland forming a complex of habitats with dense vegetation managed under low intensity.

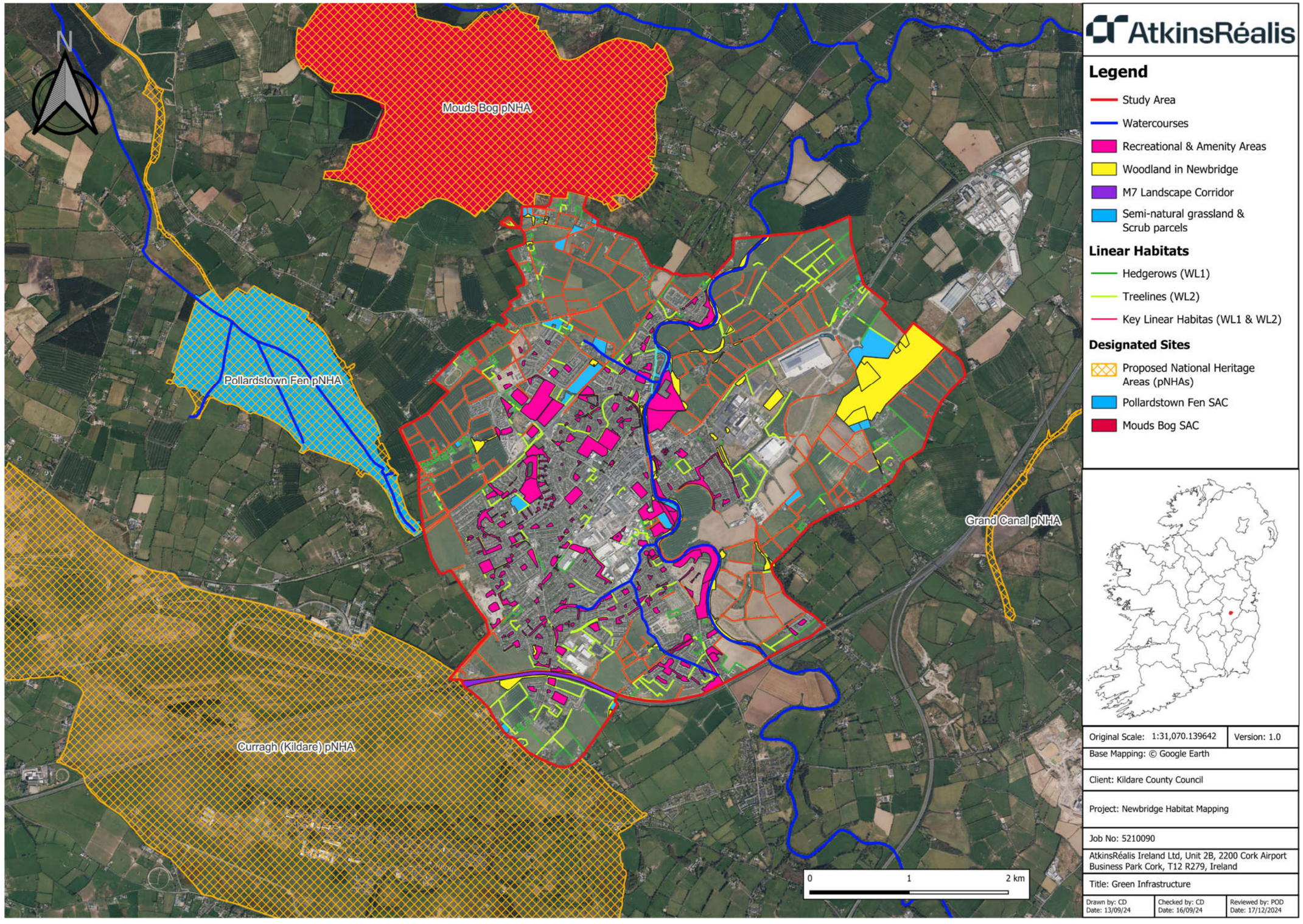

Figure 3.1 - Green Infrastructure in Newbridge, Co. Kildare (Source: Google Maps).

3.2. Newbridge's Green Infrastructure

The following describes the different Green Infrastructure areas identified for Newbridge as shown in Figure 3.1. Green Infrastructure is a strategically planned and managed network featuring areas with high quality biodiversity (uplands, wetlands, peatlands, rivers, and coast), farmed and wooded lands, and other green spaces that conserve ecosystem values which provide essential services to society. This green network provides homes for wildlife, trees, and wildflowers, but they also provide a wide range of benefits for the humans that live and work in and near them, including opportunities for recreation and relaxation, protection of soil and water quality, flood regulation, carbon sequestration, and sustainable production of food and fuel.

Green Infrastructure networks are made up of core areas of high biodiversity value connected by corridors or stepping stones. Corridors are more or less linear avenues of habitats that link larger areas of habitats and allow animals, birds, and plants to move among them. Examples of corridors could be hedgerows linking areas of woodland or rivers and riverside habitats connecting larger areas of wetlands or natural grasslands. Stepping stones are more isolated habitat patches located in built-up areas or intensive farmland that allow animals and plants to jump between core habitat areas. Stepping stones include small wetlands or ponds in farmland, grasslands that have developed on abandoned quarries, or even urban parks. The importance of corridors and stepping stones is that they reduce ecological fragmentation in the landscape, increasing connectivity among habitats and giving plants and animals greater access to living space and other resources.

Under the Article 10 of the Habitats Directive planning and development policies must endeavour to conserve and manage sustainably corridors and stepping stone habitat features. In recognition of this the Kildare County Development Plan (2023 - 2029) proposes actions to address biodiversity in County Kildare and to prepare a plan for its management at a local level.

3.2.1. Pollardstown Fen and Environs

Pollardstown Fen is located ca. 360m to the west of the Newbridge study area, it is a fed, post-glacial fen occupying an area of 220ha (550 acres) that can be traced back to the end of the last Ice Age, approximately 12,000 years ago (Inland Waterways Ireland). Pollardstown fen is the largest spring-fed fen in Ireland and has a well-developed flora and fauna. Owing to the rarity of this habitat and the numbers of rare organisms found there, the site is rated as of international importance.

Pollardstown Fen is recognised as an area of International Importance due to the presence of habitats and species listed on Annex I and Annex II of the EU Habitats Directive respectively. This includes habitats such as * Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae (7210), * Petrifying springs with tufa formation (Cratoneurion) (7220) and Alkaline fens (7230) in addition to all three Whorl snails listed on Annex II of the EU Habitats Directive i.e., *Vertigo geyeri* (1013), *Vertigo angustior* (1014) and *Vertigo moulinsiana* (1016) (NPWS, 2003).

Pollardstown Fen is also of ornithological importance for both breeding and wintering birds. Species such as Little Grebe, Coot, Moorhen, Teal, Mallard, Mute Swan, Water Rail, Snipe, Sedge Warbler and Reed Bunting breed within the fen vegetation. Reed Warbler and Garganey, both rare breeding species in Ireland, have been recorded at Pollardstown and may have bred. More recently, specialised bird species associated with fens such as Marsh Harrier and Savi's Warbler, have been seen at Pollardstown (NPWS, 2003).

Vegetation within the fen consists mainly of saw sedge (*Cladium mariscus*), reed (*Phragmites australis*), blunt-flowered rush (*Juncus subnodulosus*) and a variety of sedges (*Carex* spp.). The vegetation is quite varied and species-rich with numerous well-defined plant communities and several rare or scarce species, including narrow-leaved marsh orchid (*Dactylorhiza traunsteineri*[15]), fly orchid (*Ophrys insectifera*) and broad-leaved bog cotton (*Eriophorum latifolium*). Species and communities characteristic of more nutrient-rich conditions occur on the fen margins where the water first emerges from the ground, while the central fen area is dominated by more uniform and less nutrient demanding vegetation types.

The semi-natural habitats in proximity to Pollardstown Fen such as the hedgerows (WL1) grassland, dry meadows and grassy verges and pockets of scrub act as viable wildlife corridors leading to and from the Pollardstown Fen area. Tubridy and Associates (2007) recommended that the improved grassland habitats adjoining the fen area should be managed in the future to ensure low nutrient status in order to protect the high

[15] Narrow-leaved marsh orchid was also recorded in 2021, in Harristown Common to the east of Newbridge (Source: NBDC).

value semi-natural habitats associated with Pollardstown Fen, such as rich fen and flush (PF1)]. In practicality terms these habitats fringing the fen area should be managed to act as a buffer to trap / absorb excessive nutrients associated with the surrounding landscape before they reach Pollardstown Fen.

3.2.2. River Liffey and associated riparian habitats

Tubridy and Associates (2007) describe the main core area of ecological importance within Newbridge as the main channel of the River Liffey and the adjoining areas of semi-natural grassland, semi-natural woodland, and linear woodland habitats (as seen under 'Watercourses' and 'Woodland in Newbridge' in Figure 3.1 above). The River Liffey is not designated for nature conservation as it passes through the town but still provides the main ecological epicentre and is consistently fringed by a buffer of semi-natural habitats as it passes through the town. The most ecologically important habitats within the core and buffer area of the River Liffey include several pockets of wet woodland (WN6) specifically along both banks adjacent to the "Strand" Liffey Linear Park in the east of Newbridge, to the north along the banks immediately upstream of the principal bridge in the town (along the R445 road) and further upstream again within an island on the river close to Old Connell Weir estate. This is a rare habitat within the Newbridge study area and in the surrounding localised area generally and principally supports willows (sally and white willow), with ash, alder, elm, and beech also noted (Tubridy and Associates, 2007).

The margins of the River Liffey also support pockets of semi-natural grassland and wetland such as those identified at the Strand located upstream of the R445 road bridge. Tubridy and Associates, 2007 describes the habitats in the area as species rich wet and dry grasslands with unmanaged ancient hedgerows spreading to form a scrub type habitat. Hedgerow species composition included ash, sycamore, elder, bramble and hawthorn.

The species rich dry neutral and calcareous (GS1) grassland at the Strand supports a diverse plant species assemblage including bird's foot trefoil, lady's mantle, wild carrot, lady's bedstraw, cowslip, crested dog's tail, quaking grass, pignut, eyebright, field scabious, ox-eye daisy, wild marjoram, marsh orchid, red bartsia, rest harrow, red fescue, and yellow rattle. A total of 62 different plant species were found during fieldwork (Tubridy and Associates, 2007). Wet grassland fringing the Liffey main channel supported rosebay willowherb, alexanders, alder, meadowsweet, water mint, broad leaved dock, reed, nettle etc. Trees forming riparian woodland along the river include alder and ash (Tubridy and Associates, 2007). North of the R445 road bridge the Liffey is continuously fringed by semi-natural habitats including dry meadows and grassy verge grassland (GS2), wet willow-alder-ash woodland (WN6), tall herb swamp and mixed broadleaved woodland (WD1). As the river continues north and begins to meander it is continuously fringed by riparian woodland (WN5) on both banks (Tubridy and Associates, 2007).

Plate 3-1 - River Liffey in Newbridge (2024).

3.2.3. M7 Road Corridor and Crotanstown House

Given the dominance of agricultural grassland and associated hedges, the landscaping along the M7 may provide a lower order permeability ecological corridor for movement of animals, whilst also providing a visual woodland screen to the motorway. As the screen planting bordering the M7 corridor continues to mature it is likely that they will provide more viable ecosystem and connectivity functions. This is especially the case in those areas that adjoin hedgerows and treelines associated with adjoining agricultural land. The screen planting of alder, ash, maple, and Pinus spp. bordering the western lane of the M7 motorway provides an ecological connection between the River Liffey main channel and the north-eastern section of the Curragh. This corridor although not entirely continuous (it is traversed by three local roads) does present a mode of transit for smaller mammals and birds between these two ecologically significant areas. Care must, however, be taken in potentially attracting animals to the M7 landscape corridor. We would encourage consultation first with the Transport Infrastructure Ireland as to the location and condition of mammal mitigation measures such as underpasses, fencing etc.

3.2.4. Crotanstown House

Again, due to the dominance of improved grassland and built surfaced within the Newbridge study area, scattered trees, and parkland at Crotanstown House has been identified as a Green Infrastructure area. These woodlands habitats and their proximity to the M7 road corridor screen planting provide a valuable continuum of woodland habitats within the local area.

3.2.5. Mature woodlands at Greatconnell

An ecological network of regional importance is based around several stands of old woodland (WD1) and wet woodland (WN6) in the south and south-east of the town, centred on the Great Connell Estate (Tubridy and Associates, 2007). Although Tubridy and Associates identified this area in 2007, much of the identified woodland lies immediately outside the revised Newbridge study area boundary for which this report is concerned. Given the relevance of the habitats, all relevant information has been included for clarity.

The woodland parcels at Greatconnell are of both biodiversity and cultural importance as they support the site of an early river crossing and contains ruins of church buildings as well as several graveyards. The most valuable woodland in this area is a stand of a semi-natural wet woodland which has developed on a peat-based soil. Tree species include ash and alder and grey willow.

The woodland supports a species poor ground flora with dominant meadowsweet and frequent brambles and nettle. West of this woodland exists a series of linear mixed broadleaved woodland habitats (WD1), scrub (WS1) and older buildings associated with the lands and the boundaries of Greatconnell estate. This area supports many mature deciduous trees of considered potential to support roosting bats. Further north a line of mature pedunculate oak trees provide, although mostly isolated, an ecological consistency with the woodlands and tree cover displayed on the Greatconnell lands.

The ecological network associated with these woodlands features hedgerows (mapped as WL1) and treelines (WL2); the latter including a line of mature oak trees in a green space beside a busy road south-east of town.

Immature woodland at Greatconnell, a recently planted large broadleaved woodland (40ha) (mapped as WD1) including willow coppice in farmland to the east of the town is of regional value as a core area of biodiversity importance.

The site which is not managed includes dry meadows and grassy verge grassland, drainage ditches and hedgerows. The hedgerows provide extra connectivity with the wider landscape, but most importantly with the older more established woodlands associated with Greatconnell estate and surrounding areas.

3.2.6. Woodlands at Oldconnell

This Green Infrastructure area supports mature treelines (WL2), pockets of mixed broadleaved woodland (WD1), conifer woodland (WD4) and scattered trees and parkland (WD5) surrounding and within the grounds of a demesne dwelling at Oldconnell. The proximity of these woodland habitats to the River Liffey added to their interconnectivity connectivity via a series of hedgerows is also of note.

3.2.7. The Curragh

The Newbridge study area lies directly adjacent to the north-eastern margins of the Curragh. This section of the Curragh is designated as a Natural Heritage Area (NHA). Habitats within this part of the Curragh are dominated by dry-humid acidic grassland (GS3) which is largely absent in most other parts of the Newbridge study area (Tubridy and Associates, 2007).

The acidic grassland areas are dominated by creeping bent with broadleaved herb species including spear thistle, meadow thistle, creeping thistle, tormentil, self-heal, common mouse-ear, white clover, violet, dandelion, nettle, fairy flax, common milkwort, bush vetch, ragwort, and slender St. John's-wort. Sedges such as *Carex binervis* and *C. panicea*, field wood-rush and soft rush and several grasses including heath grass, wavy hair-grass, Yorkshire fog, crested dog's tail, common bent, sweet vernal grass, sheep's fescue, and perennial rye grass were also recorded (Tubridy and Associates, 2007). Purple moor grass dominated grassland (GS3), occurs in water logged depressions whilst raised mounds within this area support dry calcareous and neutral grassland (GS1). The dry calcareous heath is dominated by ling (Tubridy and Associates, 2007).

The most important feature within the site is an excellent example of a dry calcareous grassland habitat (GS1) on a steep sloped esker ridge. This semi-natural grassland is considered to be of regional importance for nature conservation as it supports species typically associated with the priority type calcareous grassland (Tubridy and Associates, 2007).

The semi-natural grassland at the Curragh corresponds to waxcap or *Hygrocybe* grassland, i.e., unimproved grasslands that support high species richness in particular fungal groups, namely *Hygrocybe* species or waxcaps (Feehan, 1992). *Hygrocybe* grassland, much like the grasslands at the Curragh are defined as agriculturally 'unimproved' supporting relatively high levels of grazing by species such as horses, cattle, sheep, and Lagomorphs. These grasslands are generally semi-natural in origin, support high plant species diversity and have no recent history of reseeding or fertilisation.

Plate 3-2 - Open grassland at The Curragh.

In order to buffer the impacts on sites such as The Curragh (to the south / southwest), Pollardstown Fen (to the west) and Mouds Bog (to the north) from negative impacts from the development in Newbridge, consideration should be given to creating a buffer of woodland and or wetland / woodland between the two. Fossitt (2000) *A Guide to Habitats in Ireland* describes woodland as follows: - "*woodland is defined here as any area that is dominated by trees, as opposed to shrubs, and where the canopy height is greater than 5 m, or 4 m in the case of woodland in wetland areas or on bogs."* The area around the Curragh as well as landscaping in the adjoining areas of the M7 is heavily dominated by Scot's Pine and birch. However, these species normally prefer base poor soils, whereas the area around Kildare is dominated by the Boston Hill formation (i.e. nodular & muddy limestone & shale) and to south Rickardstown Formation (i.e. cherty often dolomitised limestone). This would more naturally support the native woodland type – WN2 – *oak-ash-hazel woodland*. Any planting should therefore attempt to include species characteristic of this habitat type, whilst also trying to be consistent with the surrounding landscape. Therefore, it is recommended that landscape planting along the eastern boundary of Kildare should where practical include Scot's pine (*Pinus sylvestris*) / Pedunculate oak (*Quercus robur*) for the canopy; and species such as hazel (*Corylus avellana*), birch (*Betula pubescens*), alder (*Alnus glutinosa*) hawthorn (*Crataegus monogyna*) in the understorey (or in wetter conditions appropriate willow species; *Salix* spp.). Ideally, any such buffers, should aim to be ca. 20-30m in width. Where not possible then blocks of understorey trees should be planted in such a way as to maximise ecological connectivity and value (through close co-operation between an ecologist and landscape architect).

In the case of proximity to wetland site such as Pollardstown Fen and Mouds Bog the approach should instead focus on use of wetlands, wet woodland as well as dry types of woodland. Protection of water quality in fen sites such as Pollardstown which are fed by groundwaters is also important. This should be done in consultation with National Parks & Wildlife Service in order to synchronise with measures being proposed in the NPWS management plans for Pollardstown Fen SAC and Mouds Bog SAC.

3.2.8. Stepping stones- Semi natural grassland, woodland, and scrub parcels toward the north-western part of the Newbridge study area

A number of smaller locations have also been identified as Green Infrastructure (Figure 3.1). These are able to provide biodiversity and ecosystem services on a smaller scale than those sites discussed above. They may also function as stepping stones, facilitating movement of wildlife among the larger sites and between the Green Infrastructure of Newbridge Town and environs, and the surrounding rural landscape.

The north-western part of the Newbridge study area (i.e., northwest of the railway line and between the townlands of Rickardstown and Morristownbiller) includes discrete blocks of semi-natural grassland such as dry calcareous grassland (GS1), wet grassland (GS4) and dry meadows and grassy verges (GS2). This area also supports pockets of scrub (WS1), mixed broadleaved woodland (WD1) and scattered trees and parkland (WD5). Direct connectivity between these semi-natural habitats and the River Liffey to the south-east is significantly reduced, due to the railway line, but more significantly the extensive residential developments south-east of the railway line.

The hedgerow (WL1) and treeline (WL2) network associated with field boundaries provide connectivity to the wider landscape but most importantly to the consolidated wetland areas associated with Pollardstown Fen. Tubridy (2007) identified an area of wet grassland that supported a small tributary of the River Liffey. This watercourse provides the principal aquatic conduit from this part of Newbridge to the south of the railway line and Newbridge's extensive housing developments bordering the River Liffey main channel. In recent years this watercourse has undergone significant pressures from ongoing developments in the area. Subsequent rechecks in early 2012 confirmed that an area of dry neutral and calcareous grassland (GS1) south-west through which this stream flows has been culverted under an all-weather pitch and amenity grassland habitat.

The other pockets of semi-natural grassland i.e., wet grassland (GS4) and dry neutral and calcareous grassland (GS1) are somewhat isolated in a landscape dominated by improved grassland pastures (GA1) and arable land (BC). In spite of their isolation, they do however provide temporary refuges for wildlife in transit to larger, more consolidated semi-natural habitats i.e. stepping stones.

3.2.9. Recreation and Amenity Spaces

Recreation and Amenity Spaces found in Newbridge are of limited ecological value. However, the main functionalities of these Green Infrastructure areas include the provision of habitats that facilitate recreational and / or sporting activities or activities that enhance physical and mental wellbeing. These include amenity grassland utilised for a range of playing pitches in addition to scattered trees and parkland, a woodland category commonly used for recreational activities such as golf, running, walking. In Newbridge, this category generally includes amenity grasslands associated with larger public and private open spaces that are found in housing estates, detached dwellings, and institutional grounds (such as for example on the Pfizer or Lidl campuses). They are dominated by a small number of grasses, mainly perennial ryegrass, and red fescue and support only a limited range of broadleaved weed species, such as dandelions, white clover, and daisies. Amenity grasslands are maintained by regular mowing with frequent use of fertilisers and herbicides.

3.3. Ecological Corridors

3.3.1. Hedgerows

The outer margins of the Newbridge study area is dominated by improved grassland habitats, most of which are bordered to some extent by hedgerows and treeline networks. These hedgerows provide valuable habitats in of themselves but more importantly provide corridors for wildlife into and out of ecologically important sites particularly woodland habitats such as those adjoining or providing linkages with the woodlands at Greatconnell, Crotanstown House and those woodland habitats fringing the River Liffey (Tubridy & Associates, 2007).

As outlined above the linear / field margin habitat networks that border the pastoral fields to the north-west of the railway line and east of the River Liffey forms connectivity between the in-situ semi-natural habitats and the wider landscape.

The hedgerow network located toward the north-western boundary of the site provides considerable linear connectivity between those semi-natural grassland habitats at townlands Rickardstown, Morristownbiller and Roseberry with the wider landscape and Mouds Bog to the north and Pollardstown Fen to the west. Key hedgerows have been mapped in Figure 3.1, Green Infrastructure.

3.3.2. M7 Road Corridor

Given the dominance of agricultural grassland and associated hedges the landscaping along the M7 may provide a lower order permeability ecological corridor for movement of animals, whilst also providing a visual woodland screen to the motorway. As the screen planting bordering the M7 corridor continues to mature it is likely that they will provide more viable ecosystem and connectivity functions. This is especially the case in those areas that adjoin hedgerows and treelines associated with adjoining agricultural land. It is now dominated by a mix of hedge (WL1), scrub (WS1) and immature woodland (WS2).

3.3.3. Linear Ecological Corridor- Linear woodland habitats (hedgerows and treelines) and drainage channels on the eastern margins of the study area

The pockets of semi-natural woodland and larger areas of highly modified woodland along the study areas eastern boundary are linked to each other and to the River Liffey main channel by the various drainage ditches, treelines and hedgerows associated with the field boundaries in this part of the study area. These areas are located to the east of the River Liffey and as such are exempt from large scale residential or industrial development that characterises those areas located immediately west of the Liffey main channel.

Semi-natural habitats bordering the railway line are important habitats for songbirds, insects and native plants. The linear woodland and strips of semi-natural grassland bordering the railway line provide a suitable corridor for the movement of these species into and out of the town and between adjacent semi-natural habitats in the surrounding landscape (Tubridy & Associates, 2007).

4. Recommendations

Completing the habitat survey and preparing this report and the accompanying mapped figures and GIS database are only the first steps in conserving and enhancing the habitats within the Newbridge study area. Below are recommendations for some next steps that arise from the habitat survey.

4.1. Planning

The concept of Green Infrastructure should be further integrated into all levels of the planning process. As noted above (Box 1.1), the thinking behind Green Infrastructure is already incorporated into the Kildare County Development Plan 2023-2029. Future strategic planning should build on this and identify different types and grades of Green Infrastructure for conservation and enhancement. The key Green Infrastructure areas identified in this report should be used as a baseline. As these have been identified with biodiversity as the primary concern, additional or overlapping Green Infrastructure areas may need to be identified to fully encompass the ecosystem services provided.

Where appropriate, strategic planning should aim for synergies among ecosystem services provided by the same Green Infrastructure areas. This multi-functional approach is central to the Green Infrastructure concept and will help maximise the benefits provided by a given area. From a natural heritage perspective, a goal in strategic planning should be to reinforce and strengthen where necessary the biodiversity value of Green Infrastructure. For example, this can include improving the ecological value of public parks and other amenity areas or promoting biodiversity conservation in agricultural lands.

Ecological value should be an explicit criterion in the zoning of lands for Green Infrastructure, recreation or similar in strategic planning. The value of ecological habitats identified with Newbridge Town study area is included in the accompanying GIS and figures provided to Kildare County Council.

4.1.1. Mitigation Banking

Local authorities often adopt the principle of mitigation banking "*where the loss of habitats and features of the wider countryside is unavoidable as part of a development, to ensure that appropriate mitigation and/or compensatory measures are put in place, to conserve and enhance biodiversity and landscape character*". In some cases, it may be more effective to carry out mitigation or compensatory measures in another location than where the development is taking place. For example, there may be insufficient scope for adequate compensation, or the outcomes of mitigation may be uncertain. There may also be cases where off-site habitat creation or enhancement work may be more effective or beneficial for biodiversity than on-site works. Options for incorporating such a "mitigation banking" strategy should be explored and incorporated into planning. Where appropriate, off-site mitigation banking can be used to contribute to enhancing ecological Green Infrastructure in strategic locations both locally and at a County level.

4.1.2. Strengthen Green Infrastructure Links to the main watercourses and consolidated areas of semi-natural habitat and the Curragh

It is recommended to strengthen and reinforce links to the larger and contiguous areas of Green Infrastructure (such as watercourses and semi-natural areas). Ecological linkage from other habitats to these linear habitats is, in some areas, fragmented through the positioning of residential areas. Strategic planning should aim to strengthen the ecological linkages with these watercourses where possible. This may include reinforcing habitats along watercourses or the planting of continuous green corridors such as hedges and treelines within particular locations of the built-up residential areas.

4.1.3. Strengthen Green Infrastructure corridors

The River Liffey which runs north -south through Newbridge also offers a great opportunity to protect and enhance an existing ecological corridor through the town; from which other corridors can radiate. Planting of trees / treelines should focus on linking the river, through Newbridge to its periphery. Newbridge Town Park and Newbridge School Wood are located along the River Liffey corridor and could form important sites within this network.

To the south there are two small streams – the Greatconnell and Newbridge 09 Streams (Source: EPA Maps) – the alignments of which provide two further corridors through the town which should be protected and enhanced. To the north Rosberry 09 Stream presents similar opportunities.

In each case, the planting of trees / treelines as well as creation of areas of semi-natural habitat should be considered. Opportunities to create links outwards into Newbridge and its periphery should be explored – this should consider how disparate areas such as landscaped industrial sites (e.g. Cill Dara Industrial Estate, Lidl Campus), residential estates, sports grounds and graveyards (St. Conleth's) can all be integrated into a unified green network. To further inform this - a tree survey of Newbridge should be undertaken.

There are two identified areas of scattered trees and parkland (WD5) within the Newbridge study area; within the environs of Gaelscoil Chill Darra and Newbridge's Educate Together National School and to the north within a large stud farm. Woodland at Oldconnell includes mature treelines (WL2), pockets of mixed broadleaved woodland (WD1), conifer woodland (WD4) and scattered trees and parkland (WD5) surrounding and within the grounds of a demesne dwelling. The proximity of these woodland habitats to the River Liffey added to their interconnectivity connectivity via a series of hedgerows is of note and offers opportunities for creating and enhancing ecological corridors.

As noted, it is proposed that woodland planting and other semi-natural habitats be used to buffer the development on the outskirts of Newbridge from The Curragh, Pollardstown Fen and Mouds Bog). Where possible, ecological corridors created within Newbridge should link up with these buffer areas.

4.1.4. Biodiversity Net Gain

The concept of Biodiversity Net Gain (BNG) has been legislated as a planning condition for all developments in England. It is an approach to development that leaves local biodiversity in a better state than before. BNG still relies on the application of the mitigation hierarchy for any project or plan to avoid, mitigate or compensate for biodiversity losses. Interventions that help deliver BNG can also deliver wider environmental benefits. For example, wetland habitat creation or smaller rain gardens can deliver flood attenuation and enhanced water quality; woodland habitat creation can deliver noise attenuation, visual screening and carbon sequestration but also provides an educational and recreational resource that improves the health and wellbeing of the local population. Mechanisms for measuring and demonstrating environmental benefits are advocated through a natural capital or ecosystem service approach that is underpinned by biodiversity and frames these benefits which derive from natural capital or ecosystem assets (CIEEM, 2021)[16]. In England, the 2021 Environment Bill introduces a mandatory requirement for BNG for projects for new developments. The mandated net gain must meet a minimum of 10%. This is calculated and implemented using the Natural England Biodiversity Metric.

There is no legislated standard to calculating net loss of biodiversity in Ireland. Irish Water (2021) have developed an adjusted metric, based on the Natural England Biodiversity Metric, for use in Ireland. It is advised that consideration is given by Kildare County Council to adopting such a metric as a planning condition for further developments in Kildare and beyond.

The metric requires an assessment of the habitat value (score 1 – 12) of all habitats combined with the area or length of the habitat in question, i.e., the habitats within the boundary of the development being proposed. The ecologist must calculate the metric for the pre-development site, formulate the options for habitat enhancement or creation, and then calculate the post-development metric. At this stage, the mitigation hierarchy has already been followed; all possible habitat avoidance opportunities have been identified and applied prior to developing options for habitat enhancement and creation.

Pre- and post-development calculations for various options can be compared to determine the most biodiversity-beneficial habitat enhancement or creation options for the site.

When considering the type of habitat that should be enhanced or created, the following points should be considered: -

- Identify existing ecological networks and home ranges of species in the locality and choose habitats that support these species.

[16] CIEEM Environmental Net Gain Briefing Paper (August, 2024 - https://cieem.net/wp-content/uploads/2024/08/BE-Briefing-Paper-Aug-2024.pdf).

- Any compensatory habitat for that lost should be ‘like for like, or better’.
- Consider the difficulty in habitat enhancement/creation and likelihood of failure of any planting.
- Do not aim to transform habitats (e.g., grassland to wetland) where there is an enhancement option that can be more easily achieved.
- Don’t take short-cuts for the sake of a ‘better’ score e.g., transforming the site by planting a lot of woodland that may be difficult to manage.
- Consider whether it will be more effective to enhance an existing habitat or create a new one.
- Consider timeframes for habitat enhancement or creation – what can be achieved within the delivery contract, and what will require ongoing management to reach the desired outcome.
- Where habitats are being left to regenerate naturally (typically succeeding to some form of scrub or woodland), or where IW are planting on 3rd party lands, for the purposes of the metric consider what habitat is likely to have developed in the medium term (5-10 years).
- Be additional – do not aim to create or enhance a habitat that would happen anyway due to other commitments. It is assumed that, with the ongoing roll-out of the Biodiversity Area Plan (BAP), that reduced mowing will occur on all sites to some extent. The basic reduced mowing regime (e.g., cut every 6 weeks) should not be counted as a habitat creation measure for the purposes of calculating No Net Loss, as it is assumed that this would be progressed regardless. A more bespoke commitment to development wildflower grassland e.g., seeding with yellow rattle, meadow management, soil alteration can however be counted towards No Net loss.

4.2. Kildare Hedgerow Survey

A hedgerow survey of County Kildare was completed by Flynn Furney on behalf of Kildare County Council in 2022. Key findings of this survey and key points for the management of hedges are presented below. These data can help to inform hedge planting within proposed developments in Newbridge Town. Any such mixes should be developed by both a landscape architect and ecologist working co-operatively.

The frequency and abundance of woody shrub in hedges sample during the 2022 Hedgerow Survey was summarised in Table 6.3.1 of Flynn Furney (2022) (this is reproduced in Table 4-1). This includes a comparison with the 2006 Hedge Survey (Foulkes, 2006).

Table 4.1 - Frequency and abundance of woody shrub species occurrence in sampled hedges.

Botanical name (*Denotes introduced species)	Common name	Frequency of occurrence (%)	Mean Domain value	Frequency of occurrence in 2006 (%)
Crataegus monogyna	Hawthorn	88.2	7	93
Sambucus nigra	Elder	41.6	5	51
Prunus spinosa	Blackthorn	34.8	5	48
Fraxinus excelsior	Ash	31.7	4	57
*Ligustrum vulgare**	Wild privet	21.1	5	43
Ulex europaeus	Gorse	9.9	4	10
Ulmus spp.	Elm	9.3	5	15
Salix spp.	Willow	8	5	15
*Acer pseduplatanus**	Sycamore	7.5	5	12
Illex aquifolium	Holly	6.8	4	8
Prunus domestica	Plum	6.2	5	6
Corylus avellana	Hazel	6.2	5	13
*Symphoricarpos albus**	Snowberry	3.7	6	2
Viburnum opulus	Guelder rose	3.1	3	4
Malus sylvestris	Crab apple	2.5	6	6
Euonymus europa	Spindle	1.9	4	5
*Fagus sylvatica**	Beech	1.9	7	7
Fuchsia magellanica *	Fuchsia	1.2	2	0
*Lonicera nitida**	Box hedge honeysuckle	1.2	2	1
Prunus avium	Wild cherry	0.6	3	2
Populus tremula	Quaking aspen	0.6	3	1
Picea spp*	Spruce	0.6	3	1
*Cornus sanguinea**	Dogwood	0.6	3	1
*Buddleja davidii**	Buddleia	0.6	3	0
Cotoneaster spp.*	Cotoneaster	0.6	3	0

In addition to these shrub species, climbing and non-woody species recorded included Bramble (*Rubus fruticosus* agg.), Dog rose (*Rosa canina*) and Honeysuckle (*Lonicera periclymenum*).

The type and frequency of woody tree species recorded by Flynn Furney (2022; as listed in Table 6.7.0.1) are reproduced in Table 4-2. This includes a comparison with the 2006 Hedge Survey (Foulkes, 2006).

Table 4.2 - Frequency and abundance of woody tree species occurrence in sampled hedges.

Botanical name (*denotes introduced species)	Common name	Frequency of occurrence (%)	Frequency of occurrence 2006 (%)
Fraxinus excelsior	Ash	50	58
Crataegus monogyna	Hawthorn	29	28
*Acer pseudoplatanus**	Sycamore	17	14
Salix spp.	Willow	17	9
Quercus spp.	Oak	10	12
*Fagus sylvatica**	European beech	9	11
Corylus avellana	Hazel	4	0
Populus tremula	Quaking aspen	4	1
Cupressus spp.*	Cyprus	4	3
Betula spp.	Birch spp.	4	4
*Aeculushippocas tanum**	Horse chestnut	2	2
Picea spp.*	Spruce species	2	2
Malus sylvestris	Crab apple	2	5
Sorbus aucuparia	Rowan	2	0
Ulmus spp.	Elm	1	3
Prunus avium	Wild cherry	1	5
Alnus glutinosa	Alder	1	3
*Acer campestre**	Field maple	1	0
*Larix decidua **	European larch	1	2
*Fagus sylvatica f. purpurea**	Copper beech	1	0
*Eucalyptus globulus**	Eucalyptus	1	0
Taxus baccata	Yew	1	1
*Acer rubrum**	Red maple	1	0

Box 4.1: County Kildare Hedgerow Appraisal Survey 2022.

Aims and Objectives (in relation to Hedgerows)

Objective

To gain an overview of hedgerows in County Kildare in terms of extent and condition from a biodiversity, historical and cultural perspective in order to inform conservation priorities and asses any changes in the last decade.

Aims

To carry out a detailed field survey of hedgerows in County Kildare, quantifying extent, composition, structure, condition, and management.

To identify any rare or vulnerable species that may be present.

To compile a species list, including ground flora

Identify areas of the county which may have ancient hedgerows or hedgerows which are remnants of old woodlands.

To compare townland boundary hedgerows with non-townland boundary hedgerows.

To establish criteria to aid the identification of potential ancient hedgerow locations and composition. Collate and map the data in accordance with best practice.

To prepare a Habitat Action Plan for hedgerows in County Kildare, to include recommendations on conservation and management priorities.

To raise awareness of the ecological and cultural importance of hedgerows.

Key summary points for those managing hedgerows: -

- Hedge cut on a rotation of every 2-4 years
- 1-3 wide verge maintained as a separate habitat area
- Hedge cut and maintained at a minimum of 1.5m but incrementally increased
- A-shaped profile, with a bushy top if the hedge is tall and overgrown
- Mature trees scatted throughout the hedgerow
- Incremental cutting is key. This is cutting slightly (10cm/cut) higher and wider at each cut. This means 1-year-old wood is always available for fruiting and flowering and it also encourages hedgerow density.

The following steps should be followed for rapid growth and establishment and for the greatest benefits to biodiversity. If being planted for biodiversity as the main objective, try and achieve at least 2 metres in width with 2 metres of a grassy verge on at least one side: -

Ground preparation: -

Ground preparation should be carried out prior to tree establishment. The ground should firstly be dug up with a digger or ploughed and harrowed to break up the soil. This creates the best conditions for rapid root growth. If digging a drain, consider creating an open drain instead of a piped drain with the hedge then established on a bank made from the excavated material.

Mulching: -

Add a mulch material of old straw, wood chip or mature compost. This will help insulate the trees from drought conditions, introduce a range of fungal and invertebrate species to the area and act as a slow-release nutrient source. Avoid farmyard manure and hay as the former is too high in nitrogen while the latter will introduce too much grass into the area. If possible, ground preparation and mulching should be done in late summer or autumn with trees, then planted in the winter or the following spring.

Planting: -

Plant a diverse range of trees and shrubs. Aim to plant at least 10 species including Hawthorn, Oak, Hazel, Wild Cherry, Crab apple, Holly and Guelder Rose. Plant density is an important consideration. Aim for at least 3 trees/m2. This encourages competition between the trees above ground and the establishment of interconnected root systems below ground. To further add to the diversity, native wildflower seed can also be spread around the trees and along the verges at establishment.

Recommendations from Survey: -

- All relevant stakeholders need to commit to eliminating the cutting of hedges during the period laid down in the Wildlife Amendment Act (2000) (1st March to 31st August) except where absolutely necessary for safety reasons.
- The public should be encouraged to report damage to, and removal of, hedgerows, including out-of-season cutting.
- Stakeholders should ensure all relevant staff (and any contractors used) have the necessary skills and data sources to implement or evaluate best practice hedgerow conservation.
- Kildare County Council should produce and adopt a 'Hedgerow Conservation Policy'.
- Strategic objectives concerning hedgerows and trees in the Monaghan Biodiversity & Heritage Strategic Plan - 'Hedgerows & Trees' and 'High Nature Value Farming' need to be highlighted, promoted, and considered by all relevant parties.
- The concept of "Heritage Hedgerow" should be introduced for hedgerows which have notable historical, structural, or species composition characteristics. This should be taken into account when planning infrastructure and could be incorporated into new developments and landscaping.
- Local groups and individuals should be encouraged to carry out local hedgerow surveys
- National legislation and policies should be put in place to protect hedgerows and there is a need for stricter monitoring in County Kildare, including: -
    1. Wildlife (Amendment) Act 2000 and Heritage Act 2018, which stipulate that hedgerow must not be cut between 1st March and 31st August (unless in specific circumstances such as road safety), to avoid harm to wildlife.
    2. EIA (Agriculture) Screening Regulations 2011 are adhered to for removal of large sections of hedgerows for farming purposes across County Monaghan. Monaghan is the only county to date which has no record of applications for
    3. EIA screening under these regulations.
    4. CAP Cross Compliance requirements, which mean that since 2009, hedges cannot be removed unless a replacement hedge of similar length is planted at a suitable location on the holding in advance of the removal of the hedge. If farmers have removed hedges since 2009, they can be penalised any stage.
    5. Nitrates Derogation, where a Biodiversity Option includes either leaving at least one mature blackthorn/whitethorn tree within each 300m of hedgerow or maintaining hedgerows on a three-year cycle.
    6. Liaises with The Forest Service of the Department of Agriculture, Food, and the Marine on forestry requirements in relation to a habitat setback (5 metres minimum).
- A review of roadside hedge cutting practices, in regard to the necessity and the manner in which hedges are cut annually.
- Local authorities already manage roadside verges, but this should be extended hedgerows abutting roads. While local authorities have a responsibility to road users and their safety regarding hedgerow maintenance, more effort must be made to ensure best practise is exercised and only experienced hedge cutters are contracted.
- Local advertising campaigns and projects (e.g., with community groups & schools) to highlight the importance of hedgerows and their benefits for nature, farming, and as beautiful landscape features.
- Guidelines should be produced for planners and road engineers dealing with hedgerows in planning applications.
- The use of locally provenanced native plant species should be specified for and hedgerow planting (including hedgerow trees). Encouraging a diversity of native hedge species consistent with the findings of this survey is recommended.

- A number of showcase sites of best practice covering different aspects of conservation and management should be developed around County Kildare. This might be done in conjunction with the Hedge Laying Association of Ireland.
- A repeat hedgerow survey for the county should be carried out no later than 2032.

Source: -

Flynn Furney Environment Consultants (2022). *County Kildare Hedgerow Appraisal Survey-2022*. Report prepared for Kildare County Council.

4.3. Management

4.3.1. Ecological Planning Guidance Measures

Table 4.3 outlines planning measures that should be implemented / incorporated into future developments within Newbridge and its environs. These measures include the retention and protection of trees, hedgerows, and treelines in addition to the enhancement of amenity grassland by the establishment of trees groups, wildflower meadows and shrubberies. These measures and other planning recommendations are outlined in further detail below.

Table 4.3 - Ecological Planning Guidance Measures.

Feature	Guidance measure
Protection of trees, hedgerows, and treelines	• Protect trees, hedgerows, and treelines as part of planning development. • Where possible, retain mature trees as part of future developments. If felling is required replacement planting should be incorporated into the development proposal. • Protection of isolated sections of hedgerow often leads to deterioration and ultimate removal of such isolated fragments; to maximise hedgerow biodiversity and viability retained sections should be connected into existing hedge or woodland network. • Enhance existing hedgerows within developments / along development boundaries by establishing connection with semi-natural habitat such as grassland (open space) or through the addition of native tree species to create small areas of contiguous amenity woodland.
Enhancement of amenity grasslands	• Plant native shrubs and trees • Establish wildflower meadows • Integrate ponds / water features as appropriate
Surface water management	• Encourage features associated with Sustainable Drainage Systems within developments.

4.3.2. Promote Best Practice in Conservation Management

Conservation management should follow best practice. There is a wealth of easily accessible information on conservation management available on the internet, in published books and magazines, from NGOs and from conservation professionals. Inappropriate conservation management can waste valuable resources and can impede progress towards meeting objectives.

Community groups have a strong role to play in managing Green Infrastructure. They should be consulted at an early stage and integrated fully into the planning and management processes. They have the advantage of being on the ground, close to the action, which facilitates monitoring progress and identifying problems at an early stage.

Some general guidance on conservation management that arises from field observations and consultations during the habitat survey includes: -

- Planting native species of native genetic stock as part of landscaping developments and public lands and as part of private gardens should be encouraged.
- Old stone walls should not be indiscriminately cleared of vegetation, as most plants growing in walls do not damage the fabric. Clearance of ivy or other dense growth should be carried out in September or October when the potential for damaging nesting birds and bats is lowest.
- A bat specialist should be consulted prior to repointing stone walls to ensure there are no bats located inside crevices. Erecting bat boxes or bat bricks can compensate for loss of roosting space.
- Semi-natural grasslands[17] should be mowed once or twice a year as a rule of thumb. More frequent mowing enriches the soil by increasing recycling of organic matter and leads to changes in species. Autumn mowing should take place after flowering and seed set. If required, grasslands can be cut a second time in early spring prior to flowering.
- Use of "wildflower" seed mixes should be avoided, as these often contain non-native species or non-native genetic stock. When introducing wildflowers, native seed, and autumn cuttings, preferably from a known local source, should be used (in compliance with the Wildlife Act).

4.3.3. Enhancing Amenity Grasslands

Amenity grassland accounts for ca. 1.86km² of the Newbridge study area without accounting for those areas associated with private dwellings. This represents a significant resource of green space, much of which could be improved for biodiversity without losing recreational amenity value. Possible measures for enhancing amenity grassland for biodiversity include: -

- Planting native trees or areas of dense shrubs.
- Establishing flowerbeds with a diverse range of flowering species to provide nectar and pollen at different times of year for a wide range of insects.
- Establishing wildflower meadows.
- Allowing areas to develop tall, grassy meadows.
- Creating wildlife ponds or wetlands.
- Planting low management intensity vegetable and herb gardens and leaving some space for weeds.
- Supplementing the above with bird or bat boxes or building dens or hibernation areas for small animals, such as hedgehogs.

Not all of the options above will be suitable for all areas, and some, such as wildflower meadows or wetlands, will require long-term management. In developed estates, more aesthetic options may be preferable, and public safety will be a greater concern, which may rule out ponds, for example. Native species should be used to enhance or replace amenity grassland areas whenever possible, as these tend to support a greater range of native insects and birds. While non-native flowering plants and shrubs can have some biodiversity value, the emphasis where possible should be placed on creating semi-natural wildlife habitats. A focus on "prettification" alone will have limited ecological benefits.

[17] This exempts those semi-natural grasslands associated with the Curragh. Management recommendations pertaining to grasslands on the Curragh are outlined separately.

4.3.4. Enhancing Gardens for Biodiversity

Ecological connectivity through corridors and stepping stones are becoming increasingly fragmented through the spread of residential and business developments. The priority in modern gardens is leaning towards aesthetics and lower maintenance, with hard surfaces, gravel and artificial lawns becoming increasingly popular. However, given the linear connected formations created by gardens in housing developments, they provide an opportunity to bolster and connect the ecological corridors and stepping stones. While it may not be possible to achieve high biodiversity in small gardens, collectively they can provide increased habitat and connectivity between areas of higher biodiversity, reducing the risk of ecological islands in densely developed areas.

In the United States, the National Wildlife Federation have developed a concept of rewarding private landowners for efforts to create "*wildlife habitats*" in their gardens has been successful in spreading awareness and encouraging small-scale biodiversity enhancement projects. They have formulated a user-friendly checklist for participants, outlining what is required to achieve the certification. Such a campaign in addition to locally subsidised native tree planting on private property would create awareness of the importance of personal accountability in the conservation of local biodiversity, in addition to providing further ecological stepping stones and corridors within the study area. Opportunities to integrate such an approach into the Tidy Town process should be investigated.

Their potential biodiversity value should also be considered when proposing to develop/ manage allotments.

4.3.5. Tree and Hedges

A policy of replacement planting should be investigated for mature trees within and adjoining the study area, including stand-alone trees; treelines; trees within hedges and trees in natural and mixed woodland. Otherwise, in years to come, as specimen trees progress from mature to over-mature; there is an increasing risk of loss of specimen trees to storms.

Appropriate protection should be carried out for as many hedgerows and treelines as possible where they come under future development pressure. However, the protection and isolation of small sections of hedges in the landscape often does not achieve the intended aim of protecting biodiversity as these isolated fragments tend to lose species richness and quality over time; in many cases they ultimately end up being removed. We would instead encourage consideration of the protection of a more meaningful set or network of hedges when site layouts are considered; a developer should be required to seek the advice of an ecologist and / or appropriately qualified landscape architect when making these decisions and consideration be given to hedgerow quality, opportunities for habitat compensation / biodiversity gain, habitat connectivity etc. Furthermore, we would encourage where possible that retained hedges should be the focus for the planting of small areas of woodland (using e.g. quick growing species such as alder, birch, ash, willow, hazel etc. as appropriate to the site), or areas of wet grassland / wetland as appropriate. The objective should be to create habitat patches / stepping stones within the landscape; to maximise the type and diversity of habitats and to allow proper connectivity between urban and peri-urban parks and the surrounding rural landscape. Further studies should be completed to rank and evaluate local hedgerows whilst providing recommendations on the future management and planting regimes associated with hedgerows.

Planting Trees For Pollinators (All-Ireland Pollinator Plan) recommends the following native pollinator friendly trees[18]: -

- Hawthorn/ Whitehorn
- Willow
- Blackthorn
- Rowan
- Wild Cherry

[18] https://pollinators.ie/planting-trees-for-pollinators

- Crab Apple

Table 4-4 reproduces Table 15.1 of the County Development Plan (KCC, 2023) presents a summary of native plants that can be used in planting schemes.

Table 4.4 - Native Trees and Shrubs (from Table 15.1(a) of KCC CDP, 2023).

Common name	Height (max)	Suitable for public open spaces	Suitable for streets and confined spaces	Suitable for tubs, containers and raised beds etc.	Guide to planting: See key below
Alder	22m	Yes	No	Yes	ADPS
Alder Buckthorn	6m	Yes	No	Yes	D
Ash	28m	Yes	No	No	ADIPS
Aspen	24m	Yes	No	No	DPSV not close to buildings or services.
Arbutus (strawberry tree)	8m	Yes	No	Yes	Not frost hardy
Bramble	2m	No	No	No	C / H tends to be invasive
Broom	2m	Yes	No	Yes	Tolerates dry conditions
Burnet Rose	2m	Yes	No	Yes, but vigorous	C / H. Restricted distribution.
Common (or European) Gorse	2.5m	Yes	No	In a rural setting	HV
Crab Apple	6m	Yes	No	No	AHIP
Dog Rose	2m	Yes	No	Yes, vigorous	C / H
Downy Birch	18m	Yes	Yes	Yes	ADIP
Elder	6m	In hedge	No	No	V
Grey Willow	10m	Yes	No	No	AHDV
Guelder Rose	4.5m	Yes	No	No	DH
Hawthorn	9m	Yes	Yes	Yes	AHIPS
Hazel	6m	Yes	No	No	AHS
Holly	15m	Yes	Yes	Yes	AHPS
Honeysuckle	climber	Yes	On walls	No	C
Ivy	climber	Yes	Yes	Yes	C
Juniper	6m	Yes	No	No	S
Pedunculate Oak	30m	Yes	No	No	AI only suitable
Purging/	8m	Yes	No	No	HP
Rowan or	9m	Yes	Yes	Yes	ADHIP
Scots Pine	24m	Yes	No	No	AI
Sessile Oak	30m	Yes	No	No	AI only suitable
Silver Birch	18m	Yes	Yes	Yes	ADIP
Sloe, Blackthorn	3m	Yes	No	No	AHPV
Spindle	7.5m	Yes	No	No	H
Whitebeam spp.	12	Yes	Yes	Yes	IPS
Wild Cherry	15m	Yes	Yes	Yes	AHI

Common name	Height (max)	Suitable for public open spaces	Suitable for streets and confined spaces	Suitable for tubs, containers and raised beds etc.	Guide to planting: See key below
Wild Privet	3m	Yes	Yes	Yes	No
Willow spp.	6m	Some	No	No	V Not suitable
Wych Elm	30m	Yes		No	PS
Yew	14m	Yes	No	Yes	AIPS

Key - (Native Trees and Shrubs)

A - Grows in a wide variety of soils

C – Climber

H - Suitable for hedging

I - Suitable as an individual tree

D - Tolerates or prefers damp conditions

P - Tolerates smoke or pollution

S - Tolerates shades

V - Invasive

Key considerations when deciding on what plant species to use include i) climate resilience and ii) risk of plant disease (e.g. ash-dieback, fireblite, etc.). Plant pest risk factsheets can be downloaded from the Department of Agriculture, Forestry and Marine webpage at – https://www.gov.ie/ga/foilsiuchan/7b101-pest-risk-analysis-unit-plant-pest-risk-register-factsheets/.

4.3.6. Tree & Shrub Cover

It's an Action of the Kildare County Development 2023 – 2029 to survey the existing tree coverage in urban areas during the preparation of LAPs, and to increase this urban canopy coverage by 30%. Recommendation are presented in Box 4.2, overleaf, while recommendations for new housing estates are presented in Box 4.3. In particular details of the Miyawaki Pocket Forest method are presented in Box 4.2[19]. Refer also to Section 4.1.3 which outlines areas which could be targeted for planting, such as along the boundaries between Newbridge and the open grasslands of the Curragh in order to shield the Curragh from excess light pollution.

[19] https://www.creatingtomorrowsforests.co.uk/blog/the-miyawaki-method-for-creating-forests#:~:text=One%20of%20the%20most%20noticeable,to%20a%20larger%20tree%20falling.

Box 4.2: Recommendations on Tree and Shrub Planting (NHBC Foundation, 2021).

Structural heterogeneity of planting is important in creating high quality places for wildlife. A varied structure provides a greater range of features used by different wildlife, and so provides for a greater diversity of species.

There are four key principles to consider when planting blocks of trees or shrubs to make the most of structural planting for wildlife. Depending on the size of plot, aim to use a combination of these planting patterns (see also Figure 17, NHBC, 2021): -

- vary the number of species in clumps or groups of trees using one to three species.
- vary the area of clumps or groups of trees.
- vary the space between clumps or groups of trees.
- vary the space between trees within clumps or groups of trees.

In addition, straight planting lines are usefully avoided as, although they might provide minor easement of maintenance, they: create wind funnels, which cool the micro-climate, lower humidity, limit shelter and cause cooling in spring when wildlife, especially invertebrates, needs warmth cause sight lines, so remove concealment that is important to many animals. Applying these principles to create naturalistic landscaping with trees helps diversify both horizontal and vertical structure making it attractive to more wildlife. (NHBC Foundation 2021).

If possible, tree planting and tree pits should be incorporated within a planted area such as a rain garden. This facilitates the percolation of rainwater from the impermeable areas and also enhances the growing environment for the tree and improves the water handling capacity of the rain garden. In order to resolve these issues, urban trees are often planted into specially designed "tree pits" that are composed of designed soils and substrates that can both support the surrounding paved areas, roads etc. and also allow for water movement, air diffusion and tree root growth. There are various proprietary designs available. (DHLG - Nature-based solutions).

Source: -

- NHBC Foundation (2021). *Biodiversity in new housing developments: creating wildlife-friendly communities*. NF89. https://www.nhbcfoundation.org/wp-content/uploads/2021/05/S067-NF89-Biodiversity-in-new-housing-developments_FINAL.pdf
- Butfoy (2023). *Miyawaki Method Handbook*. By Louise Butfoy for Kent County Council. August 2023. https://treecouncil.org.uk/wp-content/uploads/2023/08/SOF-TOW_Miyawaki-Method-Handbook-KCC-Aug-23.pdf

Additionally, the Miyawaki Pocket Forest method, based on an innovative woodland establishment and management approach which aims to reconstruct woodlands to enable delivery of benefits for people, wildlife, biosecurity, and ecosystems; is recommended for consideration in the approach to tree and shrub planting. The original Miyawaki methodology has been adapted over the years to include the planting of successional species and canopy layers. This approach is more suited to smaller, urban projects – as it helps to rapidly increase the biodiversity potential of the site and allows the plot to emulate a more naturalistic secondary growth woodland, rather than aspiring to quickly achieve a climax canopy. Benefits of this system include connecting communities to nature, supporting human health and well-being, sequestering carbon, noise pollution buffering, creating shade, cleaning the air and attracting biodiversity.

Box 4.3: Guidance on Biodiversity in New Housing Estates.

General Principles taken from Guidance on Biodiversity in New Housing Estates (NHBC Foundation, 2021):

Place-making: -

Existing natural features retained within the development footprint, be they veteran trees, old hedgerows, or ponds provide a context and character for the development. Incorporating them into the landscape scheme ensures continuity of that character. At the same time, doing so ensures more opportunities for wildlife than if starting from scratch, and provides enjoyable recreational space, through which the value of homes can be increased.

Implementations costs: -

Examples of potential cost savings: -

- retaining soils and adapting planting / seed mixes to suit them rather than importing soil should cause fewer plant failures and reduce soil handling
- Sustainable Drainage Systems (SuDS) that use soft landscape features have lower installation and maintenance costs than hard engineered solutions
- locally adapted native species are more durable, so have lower long-term maintenance costs

Protection and enhancement of wildlife: -

- Create wildlife friendly multi-functional spaces
- Provide opportunities for building dependent species like bats and swifts
- Provide features for wildlife throughout the development even in built-up areas.
- Design landscaping with wildlife in mind.
- Incorporate enhanced sustainable drainage systems (SuDS)
- Ensure boundaries are permeable to wildlife
- Protect and enhance existing features (rather than starting from scratch).

Brownfield Land Recommendation: -

Developments on brownfield land which incorporate into their landscape designs elements of the specialised habitats that develop on formerly developed land once it is abandoned, have real potential to retain what are often now rare and specialised species characteristic of these sites. Also, replicating brownfield features can lead to increased biodiversity.

Greenfield Land Recommendation: -

Meanwhile, greenfield sites are often characterised by features such as hedgerows, mature trees, streams and ponds; these should be retained and used to inform both the layout of a site to accommodate them, and the design of the greenspace, which would use them as focal points. Existing connections between these features should be retained and new links created to provide so-called ecological networks.

Mitigation Hierarchy (to be incorporated into Design): -

Avoid: Could damage to important habitats on site be avoided by considered layout, phasing, alternative technologies, reducing the scale of the development?

Minimise: Can alternatives to the development's location, siting, scale, layout or phasing be used to minimise impact?

Rehabilitate: Where features of ecological value must be temporarily damaged or removed to allow the development to take place, and these impacts are deemed acceptable, every effort should be made to return these areas to as close to the original state as possible, or better.

Compensate/offset: Any residual negative impacts should be compensated for by the creation or enhancement of habitat.

Fences and Walls: -

Hard boundaries such as walls and fences form a barrier to ground dwelling animals such as hedgehogs, reptiles and amphibians, inhibiting their movement around a housing development. Creating small 13cm diameter or 13cm square holes in garden fences or walls allow them to pass between gardens. Avoid making holes that lead directly onto roads. Incorporating wildlife highways can also help with increasing biodiversity.

Verges with SuDS features incorporated to benefit wildlife: -

- a varied vegetation structure, including grasses, low herbaceous vegetation, shrubs and trees
- a continuity of vegetation cover, linking with other landscape features to provide safe connectivity for, for example, hedgehogs to help them move through the development with minimal road crossing
- informal landscaping of grass and wildflower mixes appropriate to soil types and or conditions, with regularly mown areas adjacent to paths and roads, and more extensive mowing elsewhere.
- Where shrubs are used, plant mixtures of native and non-native shrubs of wildlife value in informal irregular shrub beds.

Bioretention beds and filter strips: -

Bioretention beds and filter strips manage run-off from paths and roads. Omitting kerbs or leaving gaps between kerb stones allows water to enter these features. Removing kerbs makes it easier for wildlife such as amphibians and hedgehogs to escape the road.

Conveyances: -

Where water needs to be conveyed across hard landscapes, rills or stone lined channels can add interest. These can be enhanced by planting wetland species around check dams or incorporating other design elements that can also be enhanced by planting.

Rain gardens: -

These are shallow depressions with free-draining soil that slow and clean the run-off they receive from paved areas and roofs often via a water butt and downpipe. Or wildlife benefit ensure that planting is nectar-rich and of benefit to pollinators.

Use of materials generated from site clearance: -

Materials generated from site clearance and construction where repurposed have a use in creating new features instead of being carried off site with costs involved. Soft landscaping features can also be created using repurposed materials: Beetle bank, butterfly bank, community orchards and allotments.

Roost features for bats: -

The following features can be incorporated into the design to maintain and encourage bat populations:

- retaining and enhancing existing mature landscape features e.g. trees, hedges, ponds and streams, within the development as these are favoured foraging areas.
- ensuring good connectivity between roosts and foraging areas by providing native hedges and trees
- designing the lighting plan to avoid illuminating roost entrances or the areas between the roost and foraging areas. (Follow Local Guidelines).

Source: -

NHBC Foundation (2021). *Biodiversity in new housing developments: creating wildlife-friendly communities*. NF89.

https://www.nhbcfoundation.org/wp-content/uploads/2021/05/S067-NF89-Biodiversity-in-new-housing-developments_FINAL.pdf

4.3.7. Wetlands/Surface Water Management

Wetland loss has been a significant feature of biodiversity loss in Ireland. When attenuating or treating surface water runoff, consideration should be given to adopting soft engineering solutions. When designed, built and operated appropriately these can represent valuable additions to biodiversity in an area while also assisting in the delivery of good status in all our rivers in Ireland as required by the Water Framework Directive. The need to protect and safeguard surface and groundwater quality within the Newbridge study area is particularly pertinent. The many diverse semi-natural wetland habitats located within the localised area (e.g. Pollardstown Fen) are perpetuated by the intricate surface and groundwater features associated with the study area. Point source or more extensive impacts to watercourses in these areas have the potential to result in considerable changes to the diversity and the overall integrity associated with these wetlands areas.

The Department of Housing, Local Government and Heritage (DHLGH) recently published *Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas Water Sensitive Urban Design*. A summary of nature-based solutions to the management of rainwater and surface water runoff in urban areas is presented in Box 4.4.

Box 4.4: Nature-based solutions to the management of Rainwater and Surface Water Runoff in Urban Areas.

Enhance water quality and resource management by: -

- Ensuring flood risk management informs place-making by avoiding inappropriate development in areas at risk of flooding in accordance with The Planning System and Flood Risk Management Guidelines for Planning Authorities.
- Ensuring that River Basin Management Plan objectives are fully considered throughout the physical planning process.
- Integrating sustainable water management solutions, such as Sustainable Urban Drainage (SuDS), porous surfacing and green roofs, to create safe places.

Irish Water (now known as Uisce Éireann) policy is to promote the use of nature-based solutions in urban areas in order to reduce the need for large scale and more costly underground solutions such as large pipes and tunnels. Traditional engineering solutions to rainwater management using gullies and piped underground networks are not easily adapted to a changing rainfall pattern. Which can potentially result in catastrophic flooding.

To facilitate the restoration of rivers in urban areas, there is a need for local authorities to take a proactive approach. This should involve the consideration of any future requirements that would facilitate such restoration, in line with Water Framework Directive objectives. This is likely to include 'making space' for water bodies within developed areas and identifying riparian areas that need to be protected and should be based on historic river mapping as well as on the OPW catchment flood risk modelling. This approach can be used to inform other spatial plans such as development plans and local area plans and to support the restoration of urban rivers and streams to the largest extent possible, as development takes place.

In order to use a water sensitive urban design approach, it is important that, having looked at the urban area in three dimensions and mapped the anticipated rainfall flow patterns, that urban areas are designed to contribute, as far as practicable, to the retention, treatment and storage of rainwater, prior to its discharge back to the water environment. Using an innovative approach to urban design, it should be possible to achieve this while also enhancing place making, the use of sustainable transport and the "self-regulated streets" approach promoted by DMURS.

Areas around buildings should be designed to incorporate appropriate nature-based solutions to the management of rainwater and surface water runoff. Basements should be designed with sufficient vertical clearance below finished ground level that will allow sufficient soil depth for planted areas above the basements to retain and treat rainwater runoff before disposal through underground pipes into the drainage system.

Source: -

Department of Housing, Local Government and Heritage (DHLGH) (2022). *Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas Water Sensitive Urban Design*. Best Practice Interim Guidance Document.

4.3.8. Road Network

The National Biodiversity Data Centre published guidance for pollinators along transport corridors in 2022. Key elements of this guidance are summarised in Box 4.5.

Box 4.5: Pollinator-friendly management of: Transport Corridors.

Actions for pollinators along transport corridors (roads and railways): -

A. Identify and protect existing areas that are good for pollinators.
   - **Action 1:** Protect existing sources of food and shelter for pollinators
   - **Action 2**: Limit habitat loss during project or maintenance works
   - **Action 3**: Protect embankments and rock cuttings for pollinators
   - **Action 4**: Protect boundary walls for pollinators
   - **Action 5**: Protect 'Habitat islands' at junctions and interchanges for pollinators
   - **Action 6:** Consider transport corridors for nocturnal pollinators

B. Reduce the frequency of mowing of grassy areas.
   - **Action 7:** Manage immediate verge for pollinators
   - **Action 8:** Manage wider verge area for pollinators

C. Pollinator-friendly planting.
   - **Action 9:** Incorporate new native hedgerows into planting for new transport corridor landscape schemes
   - **Action 10**: Create a native wildflower meadow
   - **Action 11:** Incorporate ornamental pollinator friendly trees and shrubs into planting for new linear infrastructure landscape schemes (only where native planting is unsuitable)
   - **Action 12:** Plant pollinator-friendly trees along streets in towns and villages
   - **Action 13**: Plant pollinator-friendly seasonal beds
   - **Action 14:** Plant pollinator-friendly bulbs
   - **Action 15:** Make the area around service stations/ Luas stops/train stations/Park and Ride stops pollinator-friendly

D. Provide wild pollinator nesting habitat: hedgerows, earth banks, bee hotels.
   - **Action 16:** Manage native hedgerows as nesting habitat
   - **Action 17**: Protect embankments and rock cuttings for solitary bees
   - **Action 18**: Include shelter for solitary bees at train stations and service stations

E. Reduce the use of pesticides
   - **Action 19:** Reduce the use of Pesticide (Herbicides, fungicides, insecticides)

F. Promote the aims of the All-Ireland Pollinator Plan in planning of new infrastructure and make staff aware of management actions for pollinators
   - **Action 20:** Promote the aims of the All-Ireland Pollinator Plan when designing new linear transport schemes, and make staff aware of management actions for pollinators
   - **Action 21:** Log your actions

Source: -

NBDC (2022). *Pollinator-friendly management of: Transport Corridors*. All-Ireland Pollinator Plan, Guidelines 9. National Biodiversity Data Centre Series No. 20, Waterford. Sept, 2019. Updated Oct 2022.

4.3.9. Bats and Birds

1. The study area incorporates a mix of historic built structures; newer urban buildings and open agricultural habitats which would indicate that these could be of low to moderate value for bat species. Given the significant riverine corridor of the River Liffey and associated areas of riparian woodland as well as pockets of mixed broadleaved woodland, there are areas of good quality bat habitat within the Newbridge study area. Hedgerows and treeline networks bordering agricultural pastureland across the site provides connectivity between areas of higher quality bat habitat within the Newbridge area. We would encourage the following: -Include consideration of bats when considering developments that might impact on potential roost, foraging and commuting sites[20].

2. To this end consult with Bat Conservation Ireland, NPWS etc. as to the current understanding of bat diversity, numbers and distribution in each of the study areas and their environs.

3. Depending on the findings of the above either commission bat surveys or liaise with voluntary groups in order to assist them with the delivery of such as survey.

4. Use the findings of the above to inform decision on e.g. landscape planting at new developments; vegetation management; decide on locations for bat boxes etc.

This should then provide the Council with baseline data to inform forward planning decisions. Useful documents include: -

- NRA Best Guidelines for the Conservation of Bats - http://www.nra.ie/Publications/DownloadableDocumentation/Environment/file,3487,en.pdf

- NPWS Bat Mitigation Guidelines for Ireland. Irish Wildlife manual No. 25. - http://npws.ie/publications/irishwildlifemanuals/

- Heritage Council – the Heritage Council have published a range of documents including Bat Survey Guidelines for Heritage Buildings; Bats, Birds and You which can all be downloaded from the Heritage Council webpage at - http://www.heritagecouncil.ie

- JNCC – Habitat Management for Bats - http://jncc.defra.gov.uk/pdf/habitat_management_for_bats.pdf

With respect to birds, we would recommend liaison with BirdWatch Ireland Kildare Branch (http://www.birdwatchkildare.com/) when formulating habitat creation or landscaping proposals in order to integrate plans for erecting bird boxes and to determine which species would benefit most, e.g. Swift (*Apus apus*) are very vulnerable to loss of nest sites during building repair works (details of next boxes can be found online). The Kildare Branch of BirdWatch Ireland has recently undertaken the construction and installation of a number of bird boxes varying in size and dimensions. While many nest box programmes target high profile species, such as Kestrel (*Falco tinnunculus*) and Barn Owl (*Tyto alba*), we would also encourage installation of boxes for species such as House Sparrow (*Passer domesticus*). In all case you must ensure suitable foraging habitat is present nearby. Next box programmes can also be operated in co-operation with local schools and play an important role in biodiversity education.

4.3.10. Invasive Species

As mentioned, Japanese Knotweed (*Fallopia japonica*) and Himalayan Balsam (Impatiens glandulifera), which are Third Schedule plants, were recorded within the 10km grid square N81, which encompasses the eastern side of the study area. Japanese Knotweed (*Fallopia japonica*) is recorded in the 10km grid square N71 which encompasses the western side of the study area. Other invasive species which are not legally restricted recorded within the 10km grid squares include Butterfly-bush (*Buddleja davidii*), Cherry Laurel (*Prunus*

[20] Note: It is an objective of the Council to - Require that expert advice is sought from a suitably qualified bat expert, in developing lighting proposals along river and stream corridors or other important locations or corridors for wildlife, to mitigate impacts of lighting on bats and other species. The use of artificial lighting shall be avoided in streamside zones (see Figure 12.2 of KCC, 2023) and artificial lighting should be restricted unless absolutely necessary in the middle zone (see Table 12.4 of KCC, 2023). LEDs should, where permitted, be warm white to minimise disturbance to wildlife.

laurocerasus), Sycamore (*Acer pseudoplatanus*), Three-cornered Garlic (*Allium triquetrum*), Japanese Rose (*Rosa rugosa*) and Pitcherplant (*Sarracenia purpurea*) were also recorded within the Newbridge Study Area.

4.3.11. Managing Key Green Infrastructure

Management plans should be developed for key pieces of Green Infrastructure identified in this report, particularly those in public ownership. Drafting management plans should also be explored with other landowners, where appropriate. For many sites, appropriate management is required to conserve and enhance their biodiversity value; otherwise this value will be lost through neglect. Some sites will require removal of exotic species, and some will require regular management in the form of mowing or vegetation control. More detailed site-by-site advice is beyond the scope of this report, however, as noted above, management should follow best practice and should include community groups at all stages.

4.4. Education

4.4.1. Public Awareness and Education

Public awareness of the natural heritage within County Kildare has been raised by this project and others in the recent past. Public education on natural heritage has also been enhanced by such activities as Heritage Week. This work should continue and should also emphasise links between built and cultural heritage and natural heritage, where appropriate.

The results of this habitat survey should be disseminated widely and made available in easily accessible formats, such as on the internet and in the form of a user-friendly brochure or other publication.

4.4.2. Conservation Management

Programmes to educate the general public on gardening and small-scale habitat creation to enhance biodiversity should be supported and promoted. These should be as practical and hands-on as possible and could perhaps be linked with ongoing biodiversity enhancement of public Green Infrastructure.

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Appendices

Appendix A. Habitat Classification according to Fossitt (2000)

The table below outlines the classification of terrestrial and freshwater habitats according to the Heritage Council classification system (Fossitt, 2000). Level 1 of the hierarchy is indicated by a single-letter code, level 2 is indicated by a two-letter code, and level 3 is indicated by a three-character alphanumeric code.

Table B.1 – Heritage Council habitat classification system (Fossitt, 2000).

F FRESHWATER	
FL Lakes and Ponds	FL1 Dystrophic lakes
	FL2 Acid oligotrophic lakes
	FL3 Limestone/marl lakes
	FL4 Mesotrophic lakes
	FL5 Eutrophic lakes
	FL6 Turloughs
	FL7 Reservoirs
	FL8 Other artificial lakes and ponds
FW Watercourses	FW1 Eroding/upland rivers
	FW2 Depositing/lowland rivers
	FW3 Canals
	FW4 Drainage ditches
FP Springs	FP1 Calcareous springs
	FP2 Non-Calcareous springs
FS Swamps	FS1 Reed and large sedge swamps
	FS2 Tall herb swamps
G GRASSLAND AND MARSH	
GA Improved grassland	GA1 Improved agricultural grassland
	GA2 Amenity grassland (improved)
GS Semi-natural grassland	GS1 Dry calcareous and neutral grassland
	GS2 Dry meadows and grassy verges
	GS3 Dry-humid acid grassland
	GS4 Wet grassland
GM Freshwater marsh	GM1 Marsh
H HEATH AND DENSE BRACKEN	
HH Heath	HH1 Dry siliceous heath

	HH2 Dry calcareous heath
	HH3 Wet heath
	HH4 Montane heath
HD Dense bracken	HD1 Dense bracken
P PEATLANDS	
PB Bogs	PB1 Raised bogs
	PB2 Upland blanket bog
	PB3 Lowland blanket bog
	PB4 Cutover bog
	PB5 Eroding blanket bog
PF Fens and Flushes	PF1 Rich fen and flush
	PF2 Poor fen and flush
	PF3 Transition mire and quaking bog
W WOODLAND AND SCRUB	
WN Semi-natural woodland	WN1 Oak-birch-holly woodland
	WN2 Oak-ash-hazel woodland
	WN3 Yew woodland
	WN4 Wet pedunculate oak-ash woodland
	WN5 Riparian woodland
	WN6 Wet willow-alder-ash woodland
	WN7 Bog woodland
WD Highly modified/non-native woodland	WD1 (Mixed) broadleaved woodland
	WD2 Mixed broadleaved/conifer woodland
	WD3 Yew woodland
	WD4 Conifer plantation
	WD5 Scattered trees and parkland
WS Scrub/transitional woodland	WS1 Scrub
	WS2 Immature woodland
	WS3 Ornamental/non-native shrub
	WS4 Short rotation coppice
	WS5 Recently-felled woodland
WL Linear woodland/scrub	WL1 Hedgerows
	WL2 Treelines

E EXPOSED ROCK AND DISTURBED GROUND	
ER Exposed rock	ER1 Exposed siliceous rock
	ER2 Exposed calcareous rock
	ER3 Siliceous scree and loose rock
	ER4 Calcareous scree and loose rock
EU Underground rock and caves	EU1 Non-marine caves
	EU2 Artificial underground habitats
ED Disturbed ground	ED1 Exposed sand, gravel or till
	ED2 Spoil and bare ground
	ED3 Recolonising bare ground
	ED4 Active quarries and mines
	ED5 Refuse and other waste
B CULTIVATED AND BUILT LAND	
BC Cultivated land	BC1 Arable crops
	BC2 Horticultural land
	BC3 Tilled land
	BC4 Flower beds and borders
BL Built land	BL1 Stone walls and other stonework
	BL2 Earth banks
	BL3 Buildings and artificial surfaces

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