Whitestown Stream Enhancement Project, Tallaght, Co. Dublin

Ecological Impact Assessment (Draft)

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South Dublin County Council

JBA Project Manager

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Revision History

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Contract

This report describes work commissioned by the South Dublin County Council, by an email dated 24/02/2022. William Mulville of JBA Consulting conducted this work.

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…….. Ecologist

Reviewed by .....Patricia Byrne BSc (Hons), PhD, MCIEEM

.....Senior Ecologist

Purpose

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Contents

List of Figures

List of Tables

Abbreviations

AA	Appropriate Assessment
BAP	Biodiversity Action Plan
BoCCI	Birds of Conservation Concern in Ireland
DoEHLG	Department of Environment, Heritage and Local Government
CIEEM	Chartered Institute of Ecology and Environmental Management
EC	European Communities
EcIA	Ecological Impact Assessment
EPA	Environmental Protection Agency
EU	European Union
GIS	Geographical Information Systems
GSI	Geological Survey Ireland
NBDC	National Biodiversity Data Centre
NPWS	National Parks and Wildlife Service
pNHA	Proposed Natural Heritage Area
QI	Qualifying Interest
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SDCC	South Dublin County Council
SPA	Special Protection Area
SuDS	Sustainable Drainage System
WFD	Water Framework Directive
ZoI	Zone of Influence

1 Introduction

JBA Consulting Ireland Ltd. has been commissioned by the South Dublin County Council to undertake an Ecological Impact Assessment (EcIA) in relation to the proposed Whitestown Stream Enhancement project, Tallaght, Co. Dublin.

1.1 Aims

The aims of this EcIA are to:

- Establish baseline ecological conditions to enable identification of potentially important ecological features within the zone of influence of the project
- Determine the ecological value of identified ecological features
- Assess the significance of impacts of the proposed project on ecological features of value
- Identify avoidance, mitigation or compensatory measures
- Identify residual impacts after mitigation and the significance of their effects
- Identify opportunities for ecological enhancement

1.2 Site location

The proposed Whitestown Stream enhancement project is located along the stretch of Whitestown Stream between the N81 and Jobstown Road, within the Tallaght area of south-west Co. Dublin. The site is bordered by the aforementioned roads; residential housing units and their associate roads; and other green space areas (Figure 1-1).

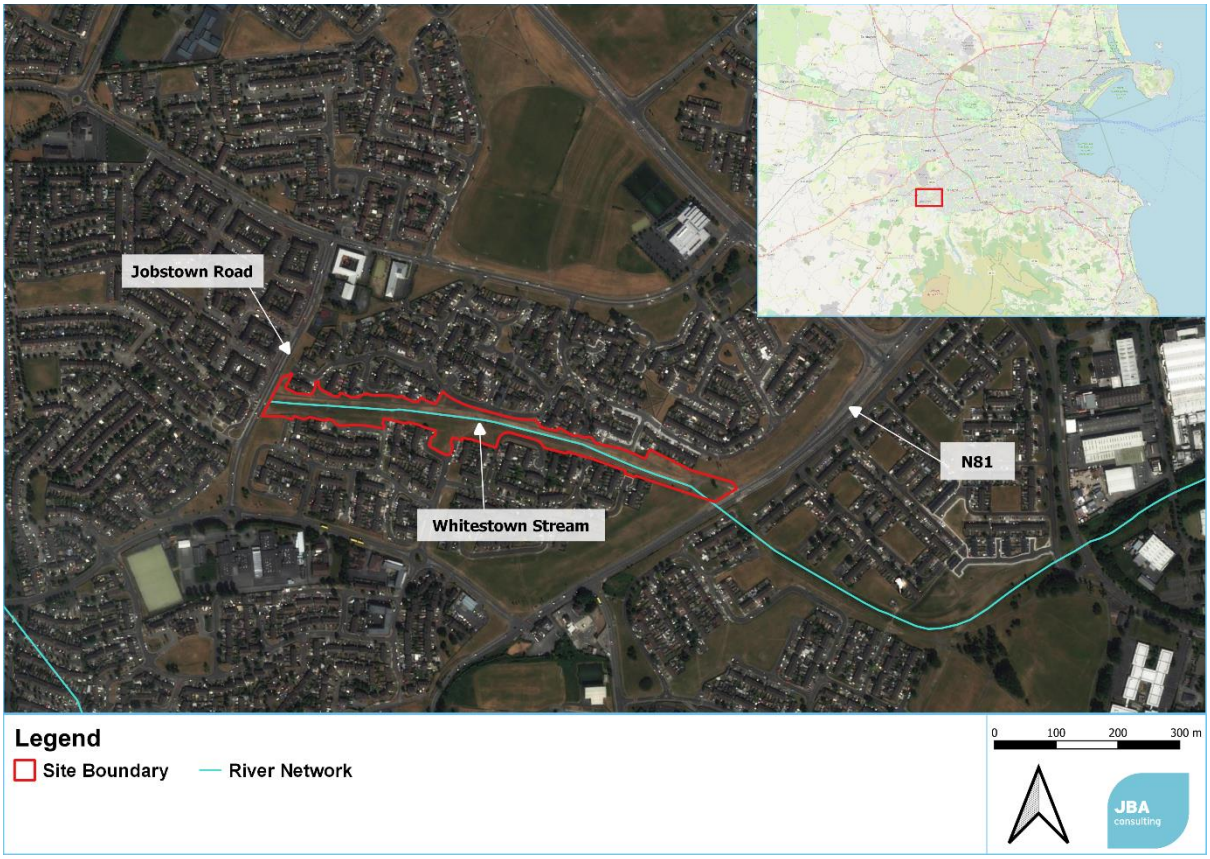

Figure 1-1: Site location (Google Satellite, 2022; OSM 2022)

2 Project Description

2.1 Proposed project

SDCC plan to upgrade the Whitestown Stream Neighbourhood Park, it is envisioned that Neighbourhood Park will become a community gathering space for all ages that offers inclusive, and flexible recreation opportunities for all.

The upgraded includes the demolition / removal of the existing pedestrian bridge within the site; the installation of two new pedestrian bridges at new bridging site towards the eastern and western extents of the site; the introduction of new pedestrian pathways; new lampposts; and enhanced landscaping, which includes tree planting.

The Site Layout and Landscape Plan can be view in Appendix A.

2.1.1 Duration of the Works

The construction of the proposed site will last approximately 6 months.

2.1.2 Machinery to be used on site

The following construction machinery likely to be used during the construction phase of the proposed site:

- Light machinery - e.g., vans and jeeps
- Small excavators for bridge demolitions and installations

2.1.3 Bridge Demolition, Excavation and Installation Details

A future detailed Section 50 engineering report will provide the required details of bridge demolition and installations. The Ecological Impact Assessment report will need to be updated following the future confirmation of the construction methodology.

2.1.4 Lighting Design

SDCC propose to reuse the approx. 16 columns along the existing Whitestown footpath, filling in the gaps in provision with new columns at 30m centres.

On the Cloonmore side, the new footpath will be provided with new columns and lanterns also at 30m centres. These lanterns will be 11W ASD LED lanterns and will provide a P4 class of light which is an average of 5 lux and a minimum of 1lux, with a uniformity of 20 %.

This is a total of 34 new columns and 50No new LED lanterns.

3 Methodology

3.1 The EcIA Team

This EcIA was completed by JBA Ecologists William Mulville BSc (Hons), MSc, ACIEEM and the report has been reviewed by JBA Senior Ecologist Patricia Byrne BSc (Hons), PhD, MCIEEM.

These staff members thus fulfil the Environmental Impact Assessment (EIA) Directive personnel requirements of 'competent persons'.

3.2 Policy and Legislation

Policy and legalisation for nature conservation; and protected and priority species relevant to the proposed project is provided in Appendix B.

3.3 Methods

This EcIA assesses the ecological features present within the site and its surrounding area (the Zone of Influence (ZoI)) in relation to the proposed works. This allows for identification of the potential impacts of the proposed works upon the ecological features of the site at an early stage, whilst identifying the potential ecological constraints upon the proposed works. The assessment is based on a desk-based assessment, which determines the baseline conditions at the site of the proposed works, and site surveys, which provided information on habitats and species present on the site and its surroundings.

This EcIA will outline the findings of the desk-based assessment and the surveys and identify any potential impacts of the proposed works on ecological features within the ZoI of the site; and propose mitigation measures to avoid or reduce impacts where necessary.

3.4 Guidance

This assessment was conducted in accordance with the following guidance documents:

- Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, (CIEEM, 2018).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (Draft) Environmental Protection Agency (EPA, 2017).

3.5 Baseline

To determine the baseline conditions at the site a review of all available information was made. When determining the pre-work conditions on-site, including the presence or absence of protected habitats and/or species, the precautionary principle was used where limited information was available.

A desk-based assessment was carried out to collate information regarding protected/notable species and statutorily designated nature conservation sites in, or within close proximity to, the study area. This included a data search for protected and notable species was conducted using the National Biodiversity Data Centre Mapping System (National Biodiversity Data Centre, 2022). A customised polygon was created to extract all the species data from the set Zone of Influence for this project.

Information for statutory designated sites including Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Ramsar Sites, Natural Heritage Areas (NHAs) and proposed NHAs (pNHA) was collected from the online resources provided by the National Parks and Wildlife Service (NPWS).

Other information on the local area was obtained, including:

- NPWS, 2019. The Status of EU Protected Habitats and Species in Ireland. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- NPWS, 2019a. The Status of EU Protected Habitats and Species in Ireland. Habitats Assessment Volume 2. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

- NPWS, 2019b. The Status of EU Protected Habitats and Species in Ireland. Species Assessment Volume 3. Habitats Assessment Volume 2. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- Environmental Protection Agency online databases on water quality (Available online at https://gis.epa.ie/EPAMaps/).
- Aerial photography available from www.osi.ie and Google Maps http://maps.google.com/ ;
- Online data available on Natura 2000 sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie
- National Biodiversity Data Centre, 2022 – Species Distribution Maps; Available online at www.biodiversityireland.ie Accessed on various dates;
- All Ireland Red Data lists for vascular flora, mammals, butterflies, non-marine molluscs, dragonflies & damselflies, amphibians and fish;
- Water Framework Directive water maps (available online at http://www.wfdireland.ie/maps.html and https://www.catchments.ie/); and
- International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species (available online at http://www.iucnredlist.org).

3.5.1 Zone of Influence

The Zone of Influence (ZoI) for the project is based on a judgement of the likely extent of the ecological impacts. This will vary for different ecological features, depending on their sensitivities to environmental change. For the majority of the project, impacts will be limited to within the site boundary. **The Zone of Influence for this project is noise disturbance (1km), air pollution (5km), surface water (5km + downstream hydrological connections), groundwater (5km) and any supporting habitat for SAC/SPA species (5km).**

This means the final 'Zone of Influence' can be a complex shape not easily defined by a simple distance figure, but in this way the assessment includes all relevant sites whilst avoiding unnecessary inclusion of other sites.

3.5.2 Field Surveys

A general ecological site walkover, including a habitat mapping survey, was conducted on the 08/03/2022 by William Mulville of JBA Consulting to inform the ecological baseline of the site.

Aerial photographs and site maps assisted the habitat survey. Habitats have been named and described following A Guide to Habitats in Ireland by Fossitt (2000). Nomenclature for higher plants principally follows that given in Webb's An Irish Flora (Parnell and Curtis, 2012).

The Survey methods were in general accordance with those outlined in the following documents:

- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009).
- Best Practice Guidance for habitat Survey and Mapping. The Heritage Council. (Smith et al., 2011).

3.6 Water Framework Directive

In response to the increasing threat of pollution and the increasing demand from the public for cleaner rivers, lakes and beaches, the EU developed the Water Framework Directive (WFD). This Directive is unique in that, for the first time, it establishes a framework for the protection of all waters including rivers, lakes, estuaries, coastal waters and groundwater, and their dependent wildlife/habitats under one piece of environmental legislation for all European member states.

The WFD (Directive 2000/60/EC) is a substantial piece of EU water legislation that came into force in 2000. The overarching objective of the WFD is for the water bodies in Europe to attain Good or High Ecological Status. The Environment Protection Agency (EPA) is the competent authority in Ireland responsible for delivering the WFD. River Basin Management Plans (RBMP) have been created which set out measures to ensure that water bodies in the country achieve 'Good Ecological Status'.

Good Ecological Quality will depend on the quality of the individual quality elements on which the Ecological status is scored; namely the biological, chemical and morphological condition in a particular

water body. Any reduction in any of these elements will result in a reduction of the overall ecological status.

3.6.1 Water Framework Status and Objectives

It is understood that the River Basin Management Plan (2018-2021) has been adopted by all local authorities in order to achieve the aims of the WFD. The Plan sets out the new approach that Ireland will take to enhance protection, prevention, and monitoring of Irish waterbodies. The main actions include:

- Improve waste water treatment;
- Conservation and leakage reduction;
- Scientific assessment of water bodies and implementation of local measures;
- A new collaborative Sustainability and Advisory Support Programme;
- Dairy Sustainability Initiative;
- Development of water and planning guidance for local authorities;
- Extension of Domestic Waste Water Treatment Systems grant Schemes; and
- A new Community Water Development Fund

Regardless of their current quality, surface waters should be treated the same in terms of the level of protection and mitigation measures employed, i.e., there should be no negative change in status.

3.7 Screening of Ecological Features

The ecological features identified during the walkover surveys and from desk-based assessments were reviewed.

No formal EIA screening has been completed for the project, so an informal screening process is presented at the start of the results section to ensure that the assessment focuses only on features where the impact could have important consequences for biodiversity (valued ecological features). Any features which are important beyond the site level were identified for further evaluation. Ecological features with little or no value beyond the site level were screened out and a short statement explaining this is given in the screening section.

An Appropriate Assessment (AA) Screening Report has been produced separate to this EcIA (JBA, 2022), to assess the potential for effects on Designated Natura 2000 sites. The AA Screening Report concluded there was the potential for adverse significant effects on European sites arising from the proposed development, either alone or in-combination with other plans or projects. A Natura Impact Statement has been produced by JBA (2022) to address the potential impact assessment and the mitigations required to safeguard these Natura 2000 sites and their respective Qualifying Interests.

3.8 Assessment of the Effects on Features

Ecological features include nature conservation sites, habitats, species assemblages/ communities, populations or groups of species. The assessment of the significance of predicted impacts on ecological features is based on both the 'value' of a feature, and the nature and magnitude of the impact that the project will have on it. The impact is based on the project which includes a certain amount of designed-in mitigation, including construction best practice measures that will be implemented with a high degree of certainty.

3.9 Valuation of Receptors

The value of designated sites, habitats and species populations is assessed with reference to:

- Their importance in terms of 'biodiversity conservation' value (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations).
- Any social benefits that habitats and species deliver (e.g., relating to enjoyment of flora and fauna by the public).
- Any economic benefits that they provide.

The valuation of designated sites considers different levels of statutory and non-statutory protection. Assessment of habitat depends on several factors, including the size of the habitat, its conservation

status and quality. The assessment also takes account of connected off-site habitat that may increase the value of the on-site habitat through association. Valuation of species depends on a number of factors including distribution, status, rarity, vulnerability, and the population size present.

Designated sites, habitats and species populations have been valued using the scale in Table 3-1.

Table 3-1: Examples of criteria used to define the value of ecological features (derived NRA, 2008, rev. 2009)

Level of Value	Examples of Criteria
International	An internationally important site e.g. Special Protection Area (SPA), Special Area of Conservation (SAC), Ramsar (or a site considered worthy of such designation). A regularly occurring substantial population of an internationally important species (listed on Annex IV of the Habitats Directive). Designated shellfish waters. Major fisheries area.
National	A nationally designated site e.g. Natural Heritage Area (NHA), a proposed Natural Heritage Area (pNHA), statutory Nature Reserve, or a site considered worthy of such designation. A viable area of a habitat type listed in Annex I of the Habitats Directive or of smaller areas of such habitat which are essential to maintain the viability of a larger whole. A regularly occurring substantial population of a nationally important species, e.g. listed on The Wildlife Act 1976 or The Wildlife (Amendment) Act 2000. A species included in the Irish Red Data Lists/Books. Significant populations of breeding birds.
Regional/County (County Dublin)	Species and habitats of special conservation significance within County Dublin An area subject to a project/initiative under the City's Biodiversity Action Plan. A regularly occurring substantial population of a nationally scarce species.
Local (works site and its vicinity)	Areas of internationally or nationally important habitats which are degraded and have little or no potential for restoration. A good example of a common or widespread habitat in the local area. Species of national or local importance, but which are only present very infrequently or in very low numbers within site area.
Less than local	Areas of heavily modified or managed vegetation of low species diversity or low value as habitat to species of nature conservation interest. Common and widespread species.

Ecological Valuation may also be considered of Local Importance (higher value) or Local Importance (lower value) (Table 3-2).

Table 3-2: Examples of criteria used to define the value of ecological features of local importance (NRA, 2009)

Level of Value	Examples of Criteria
Local Importance (higher value)	Locally important populations of priority species or habitats or natural heritage features identified in the Local Biodiversity Action Plan (BAP), if this has been prepared Resident or regularly occurring populations (assessed to be important at the Local level) of the following: *Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; *Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;

Level of Value	Examples of Criteria
	*Species protected under the Wildlife Acts; and/or *Species listed on the relevant Red Data List. Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value
Local Importance (lower value)	Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; Sites or features containing non-native species that are of some importance in maintaining habitat links

3.9.1 Magnitude of Impacts

Ecological effects or impacts can be described and categorised in a number of ways. Examples of relevant terms are listed in the table below.

Table 3-3: Categories of Effects (derived EPA, 2017).

Effects	Categories of effects
Quality of Effects	**Positive Effects** A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
	Negative/adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Probability of Effects	**Likely Effects** The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Duration and Frequency of Effects	**Temporary Effects** Effects lasting less than a year
	Short-term Effects Effects lasting one to seven years
	Medium-term Effects Effects lasting seven to fifteen years
	Long-term Effects Effects lasting fifteen to sixty years.
Types of Effects	**Indirect Effects** (a.k.a. Secondary Effects) Impacts on the environment, which are not a direct result of the project, often produced away from the project site or

	because of a complex pathway.
	Cumulative Effects The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do-Nothing Effects' The environment as it would be in the future should the subject project not be carried out.
	'Worst case' Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents,

These factors are assessed together to determine the magnitude of the impact on the status of a habitat or species population, and on the integrity of the site that supports them. Professional judgement is then used to assign the impacts on the receptors to one of four classes of magnitude, detailed in Table 3-4.

Table 3-4: Definition of magnitude.

Magnitude	Definition
High	An irreversible or long-term impact on the integrity of a site or conservation status of a habitat, species assemblage/community, population or group. If adverse, this is likely to threaten its sustainability; if beneficial, this is likely to enhance its conservation status.
Medium	A medium to long-term impact on the integrity of a site or conservation status of a habitat, species assemblage/community, population or group, which if adverse, is unlikely to threaten its sustainability (or if beneficial, is likely to be sustainable but is unlikely to enhance its conservation status.
Low	A short-term but temporary impact on the integrity of a site or conservation status of a habitat, species assemblage/community, population or group that is within the range of variation normally experienced between years.
Negligible	A short-term but temporary impact on the integrity of a site or conservation status of a habitat, species assemblage/community, population or group that is within the normal range of annual variation.

3.9.2 Significance of impacts

The significance of an impact is a product of the value of the ecological feature and the magnitude of the impact on it, moderated by professional judgement. Table 3-5 below shows a matrix which is used for guidance in the assessment of significance, with impacts being considered to be of major, moderate or minor significance, or negligible. Impacts can also either be assessed as positive or negative using the same matrix.

Table 3-5: Significance of impacts matrix.

Value of feature	Magnitude of impact			
	High	Medium	Low	Negligible
International	Major	Major	Moderate	Neutral
National	Major	Moderate	Minor	Neutral

Regional / County	Moderate	Minor	Minor	Neutral
Local	Minor	Minor	Negligible	Neutral
Less than local	Negligible	Negligible	Negligible	Neutral

3.9.3 Residual Impacts

The project is assessed including some designed-in mitigation (e.g., appropriate drainage design). This is done where mitigation is proven to be effective and will be implemented effectively with a high certainty. Where significant residual impacts are still identified, further mitigation measures will be proposed as part of the Ecological Impact Assessment process to avoid, reduce or minimise them. Each impact assessment section assigns a final significance level to the impact described, which considers and includes the implementation of any stated mitigation measures; these are the residual impacts.

3.10 Cumulative Impacts

Potential sources of cumulative impacts were identified based on the ecology of valued ecological features. Potential sources of cumulative impacts were sought within an area where there is the potential for a significant impact on a site or species. The plans and projects identified as potential sources of cumulative impacts are described in Section 5.

3.11 Limitations and Constraints

This EcIA is based on a site visit and existing data from the above-mentioned sources. The report necessarily relies on some assumptions and is inevitably subject to some limitations. These do not affect the conclusion, but the following points are recorded in order to ensure the basis of the assessment is clear:

- Information on the works and conditions on site are based on current knowledge at the time of writing. Changes to the site since surveys were undertaken cannot be accounted for. Any changes to the proposed works will require an assessment by a suitably qualified ecologist to determine if re-assessment is required. However, the site surveys have followed CIEEM (2019) Advice note on the lifespan of ecological reports and surveys.
- Adverse weather can cause delays to the schedule and alter the timing of works. This has been accounted for using a worst-case scenario where possible.
- Floral species identification was limited given the timing (March) of the ecological walkover survey.
- The precautionary principle is used at all times when determining potential ecological sensitivity of the site.

4 Baseline Conditions

These baseline conditions present information gathered from existing reports and desk-based sources as detailed in Section 3.6 and the site visit conducted on the 08/03/2022.

4.1 Desk-based Assessment

4.1.1 Designated Sites

This section lists the designated sites of international and national importance. The ZoI for this project is a 5km general radius and any downstream hydrological connection (including transitional waters buffer) for statutory sites; and a general 5km radius for non-statutory sites. Table 4-1 below lists these designated sites with their respective importance and distance from the proposed site development**.** Figure 4-1 overleaf displays the locations of the statutory designated sites, with Figure 4-2 displaying the non-statutory (proposed and existing Natural Heritage Area) designated sites within the ZoI of the site. Table 4-2 and Table 4-3 displays site descriptions and their respective ecological features**.**

Table 4-1: Proximity and importance of designated sites within their respective ZoI buffers.

Name	Designation	Importance	Distance from site	Hydrological distance from site
Glenasmole Valley	SAC	International	2.8km	n/a
Wicklow Mountains	SAC	International	4.7km	n/a
North Dublin Bay	SAC	International	16.6km	22.1km
South Dublin Bay	SAC	International	13.1km	23.2km
North Bull Island	SPA	International	16.6km	22.1km
South Dublin Bay and River Tolka Estuary	SPA	International	13.1km	19.4km
Lugmore Glen	pNHA	National	1.1km	n/a
Dodder Valley	pNHA	National	2.4km	3.9km
Slade of Saggart and Crooksling Glen	pNHA	National	3.3km	n/a
Glenasmole Valley	pNHA	National	2.8km	n/a
Dolphins, Dublin Docks	pNHA	National	14.7km	19.4km
North Dublin Bay	pNHA	National	13.6km	20.4km
South Dublin Bay	pNHA	National	13.1km	23.1km

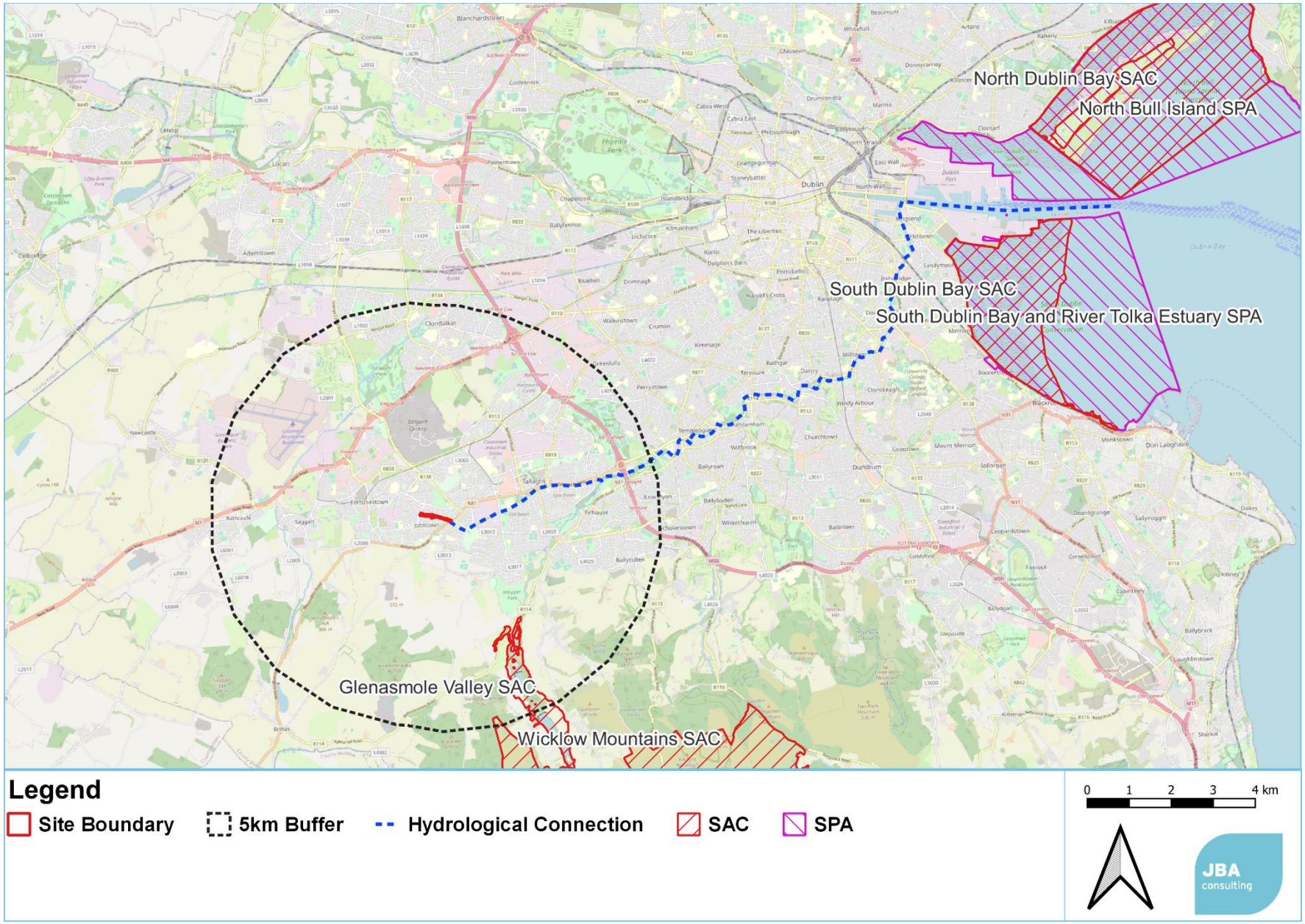

Figure 4-1: Statutory designated sites within the ZoI of the development (OSM, 2022)

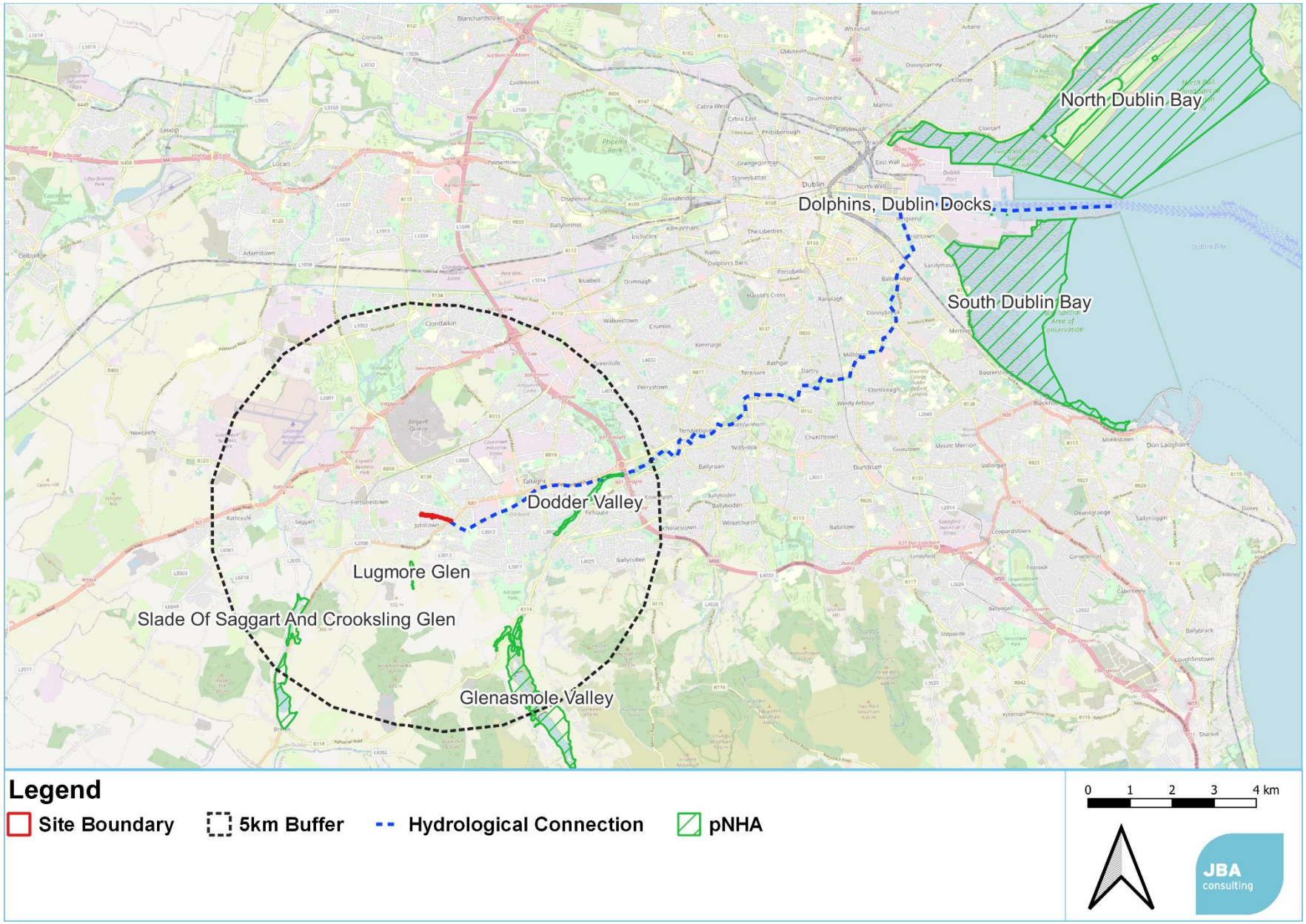

Figure 4-2: Non-statutory designated sites within their respective ZoI of the site works (OSM, 2022)

Table 4-2: Site briefs; Qualifying Interests; and project threats and their impacts and sources to the Natura 2000 sites within the ZoI.

Site Name	Brief	Qualifying Interests	Project-relevant Threats / Pressures: Impact (Source)
Glenasmole Valley SAC [001209]	Glenasmole Valley lies at the northern foothills of the Dublin and Wicklow Mountains. Dry calcareous pasture grassland, improved to varying degrees, is a main habitat of the valley sides and occurs in association with wet grassland and, in places of seepage, fen or marsh type vegetation. The site has important examples of petrifying springs. The physical and chemical properties of the springs have been studied. Good examples of orchid rich calcareous grassland, including *Pseudorchis albida* (legally protected) and *Orchis morio* (Red Data Book species) are found here. Molinia meadows are also represented (NPWS, 2017a).	- Semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid sites) [6210] - *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] - Petrifying springs with tufa formation (*Cratoneurion*)* [7220] (NPWS, 2018a)	Discontinuous urbanisation: Moderate impact (outside)# (Full list of threats / pressures - NPWS, 2017a)
Wicklow Mountains SAC [002122]	An extensive upland site comprising much of the Wicklow Mountains and extending into Co. Dublin. The solid geology is mainly Leinster granites, flanked by Ordovician schists, mudstones and volcanics. The area has been glaciated and features fine examples of high corrie lakes, deep valleys and moraines. The site includes the headwaters of several major rivers, including the Liffey, the Dargle and the Slaney. The substrate over much of the site is peat, with poor mineral soil on the slopes and lower ground. Exposed rock and scree are included in the features found in the SAC. The dominant habitats on the site are blanket bog, heaths and upland grassland. The site comprises the largest complex of upland habitats in eastern Ireland, with important examples of blanket bog, wet heath and dry heath, extensive in area and mostly of good quality. Alpine heath occurs at high levels, along with calcareous and siliceous rocky habitats harbouring an arctic-alpine flora. A fine series of oligotrophic lakes occur, with some recorded to contain Arctic char *Salvelinus alpinus*. Several oakwoods of moderate quality, typical of the dry acidic woods of eastern Ireland, are found. Eurasian Otter *Lutra lutra* occurs on several of the riverine systems (NPWS, 2018b).	- Otter *Lutra lutra* [1355] - Oligotrophic water containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletalia uniflorae and/or Isoeto-Nanojuncetea [3130] - Natural dystrophic lakes and ponds [3160] - Northern Atlantic wet heaths with *Erica tetralix* [4010] - European dry heaths [4030] - Alpine and Boreal heaths [4060] - Calaminarian grasslands of the *Violetalia calaminariae* [6130] - Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) * [6230] - Blanket bogs (* if active bog) [7130] - Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110] - Calcareous rocky slopes with chasmophytic vegetation [8210] - Siliceous rocky slopes with chasmophytic vegetation [8220] - Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] (NPWS, 2017b)	Urbanised areas, human habitation: Moderate impact (both)# Outdoor sports and leisure activities, recreational activities: Moderate impact (both)# Paths, tracks, cycling tracks: Moderate impact (both)# (Full list of threats / pressures - NPWS, 2018b)
North Dublin Bay SAC [000206]	The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th centuries. The seaward side of the island has a fine sandy beach. A substantial area of shallow marine water is included in the site. The interior of the island is excluded from the	- Mudflats and sandflats not covered by seawater at low tide [1140] - Annual vegetation of drift lines [1210] - *Salicornia* and other annuals colonising mud and sand [1310]	Discharges: High impact (inside) Urbanised areas, human

	site as it has been converted to golf courses. Nature conservation is a main land use within the site. The North Bull Island dune system is one of the most important systems on the east coast and is one of the few in Ireland that is actively accreting. It possesses extensive and mostly good quality examples of embryonic, shifting marram and fixed dunes, as well as excellent examples of humid dune slacks. Both Atlantic and Mediterranean salt marshes are well represented, and a particularly good marsh zonation is shown. The salt marshes grade into mudflats and sandflats, some of which are dominated by annual Salicornia species. Petalwort *Petalophyllum ralfsii* occurs at its only known station away from the western seaboard (NPWS, 2020a).	- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] - Mediterranean salt meadows *Juncetalia maritimi* [1410] - Embryonic shifting dunes [2110] - Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] - Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] - Humid dune slacks [2190] - Petalwort *Petalophyllum ralfsii* [1395] (NPWS, 2013a)	habitation: High impact (outside) (NPWS, 2020a)
South Dublin Bay SAC [000210]	This intertidal site extends from the South Wall at Dublin Port to the West Pier at Dun Laoghaire, a distance of c. 5 km. Several permanent channels exist, the largest being Cockle Lake. A small sandy beach occurs at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. A number of small streams and drains flow into the site. The designated site possesses a fine and fairly extensive example of intertidal flats. Sediment type is predominantly sand, with muddy sands in the more sheltered areas. A typical macro-invertebrate faunal assemblage exists within the SAC. The SAC has the largest stand of Dwarf Eelgrass (*Zostera nolti*) on the east coast (NPWS, 2020b).	- Mudflats and sandflats not covered by seawater at low tide [1140] - Annual vegetation of drift lines [1210] - *Salicornia* and other annuals colonising mud and sand [1310] - Embryonic shifting dunes [2110] (NPWS, 2013b)	Urbanised areas, human habitation: High impact (outside) Discharges: Moderate impact (both) Marine water pollution: Medium impact (both) (NPWS, 2020b)
North Bull Island SPA [004006]	The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port. The site is among the top ten sites for wintering waterfowl in the country. It supports internationally important populations of Brent Goose and Bar-tailed Godwit and is the top site in the country for both of these species. A further 14 species have populations of national importance, with particular notable numbers of Shelduck, Pintail, Grey Plover, and Red Knot. The SPA is a regular site for passage waders such as Ruff, Curlew Sandpiper and Spotted Redshank. The site supports Short-eared Owl in winter (NPWS, 2020c).	- Light-bellied Brent Goose *Branta bernicla hrota* [A046] - Common Shelduck *Tadorna tadorna* [A048] - Eurasian Teal *Anas crecca* [A052] - Northern Pintail *Anas acuta* [A054] - Northern Shoveler *Anas clypeata* [A056] - Eurasian Oystercatcher *Haematopus ostralegus* [A130] - European Golden Plover *Pluvialis apricaria* [A140] - Grey Plover *Pluvialis squatarola* [A141] - Red Knot *Calidris canutus* [A143] - Sanderling *Calidris alba* [A144] - Dunlin *Calidris alpina* [A149] - Black-tailed Godwit *Limosa limosa* [A156] - Bar-tailed Godwit *Limosa lapponica* [A157] - Eurasian Curlew *Numenius arquata* [A160] - Common Redshank *Tringa totanus* [A162] - Ruddy Turnstone *Arenaria interpres* [A169]	Continuous urbanisation: Medium impact (outside) Discharges: Medium impact (both) (NPWS, 2020c)

		- Black-headed Gull *Chroicocephalus ridibundus* [A179] - Wetland and Waterbirds [A999] (NPWS, 2015a)	
South Dublin Bay and River Tolka Estuary SPA [004024]	This designated site comprises a substantial part of Dublin Bay. It includes virtually all of the intertidal area in the south bay, as well as much of the Tolka Estuary to the north of the River Liffey. A portion of the shallow bay waters is also included. The sediments are predominantly well-aerated sands. The sands support the largest stand of Dwarf Eelgrass on the east coast of Ireland. Sediments in the Tolka Estuary vary from soft thixotropic muds with a high organic content in the inner estuary to exposed, well aerated sands off the Bull Wall. The site possesses extensive intertidal flats which support wintering waterfowl which are part of the overall Dublin Bay population. It regularly has an internationally important population of Brent Geese, which feeds on Dwarf Eelgrass in the autumn. It has nationally important numbers of a further 6 species including: Oystercatcher, Ringed Plover, Red Knot, Sanderling, Dunlin and Bar-tailed Godwit. It is an important site for wintering gulls, especially Black-headed Gull and Common Gull *Larus canus*. South Dublin Bay is the premier site in Ireland for Mediterranean Gull *Larus melanocephalus*, with up to 20 birds present at times. Is a regular autumn roosting ground for significant numbers of terns, including Roseate Terns, Common Tern and Artic Tern (NPWS, 2020d).	- Light-bellied Brent Goose *Branta bernicla hrota* [A046] - Eurasian Oystercatcher *Haematopus ostralegus* [A130] - Ringed Plover *Charadrius hiaticula* [A137] - Grey Plover *Pluvialis squatarola* [A141] - Red Knot *Calidris canutus* [A143] - Sanderling *Calidris alba* [A144] - Dunlin *Calidris alpina* [A149] - Bar-tailed Godwit *Limosa lapponica* [A157] - Common Redshank *Tringa totanus* [A162] - Black-headed Gull *Chroicocephalus ridibundus* [A179] - Roseate Tern *Sterna dougallii* [A192] - Common Tern *Sterna hirundo* [A193] - Arctic Tern *Sterna paradisaea* [A194] - Wetland and Waterbirds [A999] (NPWS, 2015b)	Urbanised areas, human habitation: High impact (outside) Discharges: High impact (inside) (NPWS, 2020d)

 # = indirect impact via increased human populace within the ZoI

Table 4-3: Site briefs and ecological features of conservation concern of proposed Natural Heritage Areas within the ZoI.

Site Name	Brief	Ecological Features of Conservation Concern
Lugmore Glen pNHA [001212]	This small, wooded glen is located about 2km south-east of Saggart in Co Dublin. It is quite a narrow valley cut in glacial drift. A small stream winds through the valley. The wood is mainly comprised of dense Hazel *Corylus avellana* but also contains Ash *Fraxinus excelsior*, Elder *Sambucus nigra* and Blackthorn *Prunus spinosa*. The herb layer is quite rich, especially towards the stream, with species such as Wood-sorrel *Oxalis acetosella*, Bugle *Ajuga reptans*, Primrose *Primula vulgaris*, Honeysuckle *Lonicera periclymenum*, Bluebell *Hyacinthoides non-scripta*, Ivy *Hedera hibernica*, Wood-sedge *Carex sylvatica*, Woodruff *Galium odoratum* and Wood Speedwell *Veronica montana* occurring. The importance of this site is that it is a fine example of a wooded glen with a good representation of woodland plants. The flora of the site is notable for the presence of the rare Red Data Book species, Yellow Archangel (NPWS, 2009).	- Yellow Archangel *Lamiastrum galeobdolon*
Dodder Valley pNHA [000991]	This stretch of the River Dodder extends for about 2 km between Firhouse Bridge and Oldbawn Bridge in the south-west of Dublin City. The vegetation consists of woodland scrub mainly comprising Willows spp., but up to	- Little Grebe *Tachybaptus ruficollis* - Kingfisher *Alcedo atthis*

Site Name	Brief	Ecological Features of Conservation Concern
	thirteen species of tree have been recorded. The understorey vegetation contains a good variety of plant species, including Early-purple Orchid *Orchis mascula* and Bugle. Along the banks there are wildflower meadows with a good diversity of plant species. Forty-eight bird species have been recorded recently in the area, including Little Grebe *Tachybaptus ruficollis*, Kingfisher *Alcedo atthis*, White-throated Dipper *Cinclus cinclus* and Grey Wagtail *Motacilla cinerea*. Part of the riverbank supports a Sand Martin *Riparia riparia* colony of up to 100 pairs. The site also supports a population of Otter. The site represents the last remaining stretch of natural riverbank vegetation on the River Dodder in the built-up Greater Dublin Area (NPWS, 2009).	- Grey Wagtail *Motacilla cinerea* - Sand Martin *Riparia riparia* - Otter *Lutra lutra*
Slade of Saggart and Crooksling Glen pNHA [000211]	This site is located in the south-west of Co. Dublin and stretches from Brittas northwards to approximately 2km south of Saggart. The northern half of the site comprises a river valley with steep tree-covered sides, while the southern side is flatter and contains two small lakes, the Brittas Ponds. The trees are mostly of planted origin with fine specimens of Beech *Fagus sylvatica*, Ash *Fraxinus excelsior*, Oak *Quercus* spp. and Birch *Betula* spp.; with some Whitebeam *Sorbus hibernica* also occurring. The flora of the site is notable for the presence of the rare Red Data Book species, Yellow Archangel *Lamiastrum galeobdolon*. South of Crooksling Glen are Brittas Ponds, a Wildfowl Sanctuary, that supports a variety of wildfowl, including Teal, Mallard, Pochard and Tufted Duck (NPWS, 2009).	- Whitebeam *Sorbus hibernica* - Yellow Archangel *Lamiastrum galeobdolon* - Teal *Anas crecca* - Mallard *Anas platyrhynchos* - Pochard *Aythya ferina* - Tufted Duck *Aythya fuligula*
Glenasmole Valley pNHA [001209]	As per Glenasmole Valley SAC descriptions in Table 4-2.	As per those outlined in SAC description
Dolphins, Dublin Docks pNHA [000201]	As per South Dublin Bay and River Tolka Estuary SPA descriptions in Table 4-2.	As per those outlined in SPA description
North Dublin Bay pNHA [000206]	As per North Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA descriptions in Table 4-2.	As per those outlined in SAC and SPA descriptions
South Dublin Bay pNHA [000210]	As per South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA descriptions in Table 4-2.	As per those outlined in SAC and SPA descriptions

4.1.2 Screening of designated sites

An AA Screening has been carried out for this project by JBA (2022). Following initial screening, and based upon best scientific judgement it is concluded that **adverse significant effects are not anticipated** from the project on the following Natura 2000 sites within the Zone of Influence:

- Glenasmole Valley SAC (001209)
- Wicklow Mountains SAC (002122)
- North Dublin Bay SAC (000206)
- South Dublin Bay SAC (000210)
- North Bull Island SPA (004006)
- South Dublin Bay and River Tolka Estuary SPA (004024)

The below pNHA sites below, are being **screened out** due one or more of the following: lack of hydrological connectivity (surface water and groundwater) and/or distance from the proposed site (surface water dilution of polluting elements); and the development's scale (capacity for dust generation):

- Lugmore Glen pNHA [001212]
- Slade of Saggart and Crooksling Glen pNHA [000211]
- Glenasmole Valley pNHA [001209]
- Dolphins, Dublin Docks pNHA [000201]
- North Dublin Bay pNHA [000206]
- South Dublin Bay pNHA [000210]

The following designated site of international and national ecological importance has been **screened in** and will be examined in detail in terms of potential impacts and required mitigations:

- Dodder Valley pNHA [000991] - potential surface water impact pathway (located 3.9km downstream of the enhancement works)

4.1.3 Protected Species

National Biodiversity Data Centre (NBDC)

Records of protected flora and fauna including invertebrates, amphibians, fish, birds and mammals collated from the NBDC (2022) database, present within the surrounding 5km within the past 10 years are listed in Appendix C. This list includes their level of protection, if they are red or amber listed on the International Union for the Conservation of Nature and Natural Resources (IUCN) Red List or the Birds of Conservation Concern in Ireland (2020-2026) and the date of the last record of this species at this location.

4.1.4 Invasive Non-native Species

The records from the NBDC (2022) database, show that there is one high-impact, invasive non-native species listed on the Third Schedule of Non-native species (subject to restrictions under Regulations 49 and 50) present within the 2km buffer zone of the proposed site within the past 10 years (Table 4-4).

Table 4-4: High-impact invasive non-native species within 2km of the proposed site

Invasive Non-native Species	Proximity to site	Likelihood of spread into proposed site
Fringed Water-lily *Nymphoides peltata*	1.7km	N/A: aquatic-based species located within different sub-catchment

4.2 Water Framework Directive

4.2.1 Surface Water Status

The site lies within the Water Framework Directive (WFD) Liffey catchment and the sub-catchments Dodder_SC_010 (EPA, 2022a). The current WFD status (2013-2018) of this section of the Whitestown Stream (Dodder_040), is 'Poor'; and is currently considered to be 'At Risk'.

The proposed development will need to ensure that the goal of 'Good Status' is achievable, and that the proposed works will not hinder this goal during the construction and operational phases.

4.2.2 Groundwater Status

The groundwater body which underlies the proposed site is the Dublin groundwater body (IE_EA_G_008). The WFD status for the groundwater body is currently marked as 'Good'; and is under review in regard to its risk status.

The bedrock underlying the proposed site is comprised of dark-grey to black, fine-grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey. There are also rare dark coarser grained calcarenitic limestones, sometimes graded, and interbedded dark-grey calcar. This bedrock is overlain with limestone till sediments, with moderate subsoil permeability characteristics. As result of the above characteristics the site's aquifer vulnerability status is rated as 'Low' (GSI, 2022).

The proposed development will need to ensure that the proposed construction works will have no negative effect on these water bodies and will support their maintaining 'Good' status into the future.

4.3 Site Visits

A baseline ecological site walkover, including habitat mapping, was conducted by JBA Ecologist, William Mulville on the 08/03/2022. Habitats and species recorded are presented in detail in the following sections.

4.4 Habitats

The value of each habitat is based on the site visit. Habitats recorded in and around the site boundary were recorded and are displayed in Table 4-5 below and Figure 4-3 overleaf.

Table 4-5: Habitats recorded during site visit.

Fossitt Habitat	Fossitt Code
Buildings and artificial surfaces	BL3
Recolonising bare ground	ED3
Eroding / upland rivers	FW1
Amenity (improved) grassland	GA1
Dry meadows and grassy verges	GS2
Scrub	WS1

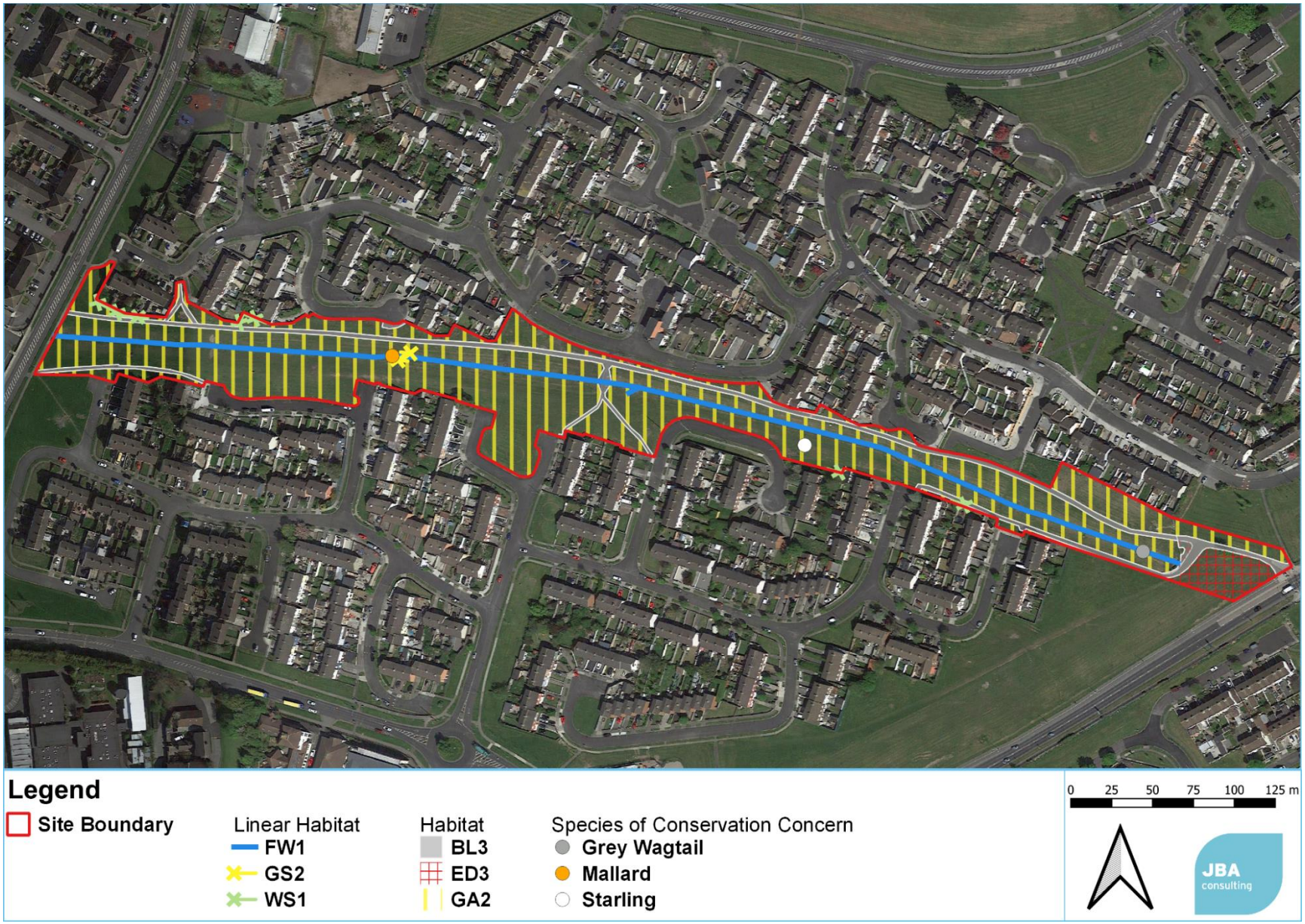

Figure 4-3: Habitat Map (Google Satellite, 2022)

4.4.1 Buildings and artificial surfaces (BL3)

This habitat refers to the pedestrian footpaths and bridge areas within the proposed enhancement works site.

This habitat is considered to have less than local ecological importance.

4.4.2 Recolonising bare ground (ED3)

A recently relandscaped area in the east of the site is still in the process of re-establishing the previous grassland habitat. Floral species recorded in this habitat included newly planted Silver Birch *Betula pendula*; Lime *Tilia* spp.; Ribwort Plantain *Plantago lanceolata*; Pineappleweed *Matricaria discoidea*; Perennial Rye-grass *Lolium perenne*; Clover *Trifolium* spp.; Hogweed *Heracleum sphondylium*; Thistle *Cirsium* spp.; and Dock *Rumex* spp. The JBA Ecologist recorded Pied Wagtail *Motacilla alba yarrellii*; Rook *Corvus frugilegus*; and Hooded Crow *Corvus cornix* utilising this habitat.

This habitat is considered to have less than local ecological importance.

4.4.3 Eroding / upland rivers (FW1)

This habitat refers to the Whitestown Stream which flows from west to east, through the centre of the enhancement works site (Figure 4-4). The concrete streambed measured approximately 1.25m in width and approximate 5-10cm in depth. Some stretches of stream contained sediment / gravel deposition along the streambed. Instream growth was limited to a Willow *Salix* spp. sapling; and a small cluster of Willowherb *Epilobium* spp. and Watercress *Nasturtium* spp. at the western end of the stream. Additionally, a small group of Mallard *Anas platyrhynchos* and Grey Wagtail *Motacilla cinerea* were recorded utilising the stream.

This habitat is considered to have county level local ecological importance given its downstream connection to the River Dodder; and its capacity to act as wildlife corridor for local faunal species.

Figure 4-4: Whitestown Stream

4.4.4 Amenity (improved) grassland

The enhancement site is dominated by low biodiversity amenity grassland (Figure 4-5). The typical floral assemblage of this habitat comprised of Perennial Rye-grass; Ribwort Plantain; Dandelion *Taraxacum* spp.; Creeping Buttercup *Ranunculus repens*; Dock spp.; Clover spp.; Lesser Celandine *Ficaria verna*; and moss species. Species of bird utilising this habitat included Blackbird *Turdus merula* and Starling *Sturnus vulgaris*.

This habitat is considered to have less than local ecological importance.

Figure 4-5: Improved amenity grassland dominates the vast majority of the site

4.4.5 Dry meadows and grass verges (GS2)

This dry grassy verge habitat was present in small unmaintained strips of grassland running alongside the Whitestown Stream. These grassy verge habitats support Cock's Foot *Dactylis glomerata*; Soft Rush *Juncus effusus*; Willowherb spp.; Thistle spp.; Nettle *Urtica dioica*; Ragwort *Jacobaea vulgaris*; Creeping Buttercup; Ribwort Plantain; Dock spp.; and sporadic Perennial Rye-grass.

This linear habitat is considered to have low local ecological importance as it provides shelter and foraging opportunities for local wildlife.

4.4.6 Scrub (WS1)

Small linear strips of scrub habitat were present along the sections of the site boundary. Floral species recorded in this habitat included Chickweed *Stellaria media*; Cleavers *Galium aparine*; Nettle; Ragwort; Willowherb spp.; Creeping Buttercup; Bramble; Ivy *Hedera hibernica*; and immature Sycamore *Acer pseudoplatanus* and Elder *Sambucus nigra*. There were also a number of ornamental garden species mixed into this habitat.

This linear habitat is considered to have low local ecological importance as it provides shelter and foraging opportunities for local wildlife.

4.5 Protected Flora

No protected floral species were recorded by the JBA Ecologist during the ecological walkover survey of the proposed site. Furthermore, the NBDC shows no record of any protected flora species being present within site or its immediate vicinity (NBDC, 2022). One protected flora species does occur within a 2km radius of the site, namely Yellow Archangel *Lamiastrum galeobdolon subsp. montanum*.

4.6 Protected Fauna

4.6.1 Mammals (Otter and Hedgehog)

While no protected mammals were recorded on-site during the ecological walkover survey, two mammals, namely Otter *Lutra lutra* and Hedgehog *Erinaceus europaeus*; have been documented as being present within a 2km radius of the site in recent years (NBDC, 2022). These mammals are protected under the Wildlife Act 1976 (and subsequent amendments), with Otter afforded additional protection under the EU Habitats Directive Annex II and IV, respectively. Under the precautionary principal, Otter will still be examined in the mitigation section of this report.

Otter in the context of this site is considered to be of **county level ecological importance,** while **Hedgehog** are considered to be of **high local ecological importance**.

4.6.2 Bats

Desk Study

At least four species of bat, namely Common Pipistrelle *Pipistrellus pipistrellus*; Soprano Pipistrelle *Pipistrellus pygmaeus*; Leisler's Bat *Nyctalus leisleri*; and *Myotis* spp. have been recorded in recent years within a 2km radius of the proposed works (JBA, 2021). Bat species are regarded as being of international ecological importance given the level of EU protections afforded to them under the Habitats Directive.

Preliminary Bat Roost Survey

During the ecological walkover of the proposed site, the JBA Ecologist did not record any suitable roosting features amongst the trees on-site. As a result, the potential bat roosting element has been screened out and will not be examined in any further detail in this report.

Bat presence / activity on-site

In the absence of bat activity survey data, under the precautionary principal, we must assume that one or more of the above bat species are likely to utilise this site for foraging and commuting given its suitability and the above data records.

The proposed site has been valued as being **of high local ecological importance** for bats.

4.6.3 Birds

The JBA Ecologist recorded three bird species of conservation concern within the site boundary during the ecological walkover, namely Mallard (Figure 4-6), Grey Wagtail and Starling. While not recorded during the walkover survey, Kingfisher *Alcedo atthis*, an Annex I species, has been recently recorded downstream west of the Sean Walsh Park.

Figure 4-6: A small group of Mallard utilising the most sheltered stretch of the Whitestown Stream

While NBDC shows no record of any other protected faunal species being present within the site boundary, an additional 13 bird species conservation concern have been recently recorded within a 2km radius of the site (NBDC, 2022). See Appendix C for the list of these species.

The proposed site has been valued as being **of high local ecological importance** for the above bird species of conservation concern.

4.6.4 Amphibians - Common Frog

Though Common Frog *Rana temporaria vulgaris* was not recorded during the ecological walkover survey, there are recent records observing both species within 2km of the site (NBDC, 2022). The low Whitestown Stream is suitable commuting and foraging habitat for Common Frog. Common Frog is protected under Appendix III of the Berne Convention and the Wildlife Act 1976 (& Amendments). Common Frog is also afforded protection under Annex V [1213] of the EU Habitats Directive.

Common Frog is considered to be **of high local ecological importance**.

4.6.5 Fish - European Eel

European Eel *Anguilla anguilla* have been recorded in the River Dodder downstream of the Whitestown Stream (Kelly et al., 2015). European Eel currently has a Critically Endangered IUCN status and is protected under the OSPAR Convention. European Eel are regarded as being of international ecological importance given the level international protections afforded to them under the OSPAR Convention.

The site's watercourse for European Eel is considered to have **county level ecological importance.**

4.6.6 Terrestrial Invertebrates

While the JBA Ecologist did not document the presence of any protected terrestrial invertebrates within the site; there are recent records of Large Red-tailed Bumblebee *Bombus (Melanobombus) lapidarius* being present within 2km of the site. The conservation status of the Large Red-tailed Bumblebee in Ireland is currently listed as 'Near threatened'.

Given the conservation status of this terrestrial invertebrates, they are considered to be of **high ecological importance** within the context of the site.

4.7 Invasive Non-native species

The JBA Ecologist did not record any invasive non-native species within the site boundary during the ecological walkover. The NBDC shows no record of any invasive non-native species being present on-site (NBDC, 2022).

4.8 Screening of Designated Sites & Ecological Features

The screening of designated sites and ecological features identified during the desktop study and ecological survey are given in Table 4-6. Sites and features screened out are not considered further in this assessment. Ecological features carried forward are assessed for potential impact during construction and operation in the following sections.

Table 4-6: Summary of ecological features and the screening assessment.

Designated site / Ecological feature	Value	Screening
Glenasmole Valley SAC [001209]	International	Screened out (JBA, 2022 - AA Screening)
Wicklow Mountains SAC [002122]	International	Screened out (JBA, 2022 - AA Screening)
North Dublin Bay SAC [000206]	International	Screened out (JBA, 2022 - AA Screening)
South Dublin Bay SAC [000210]	International	Screened out (JBA, 2022 - AA Screening)

Designated site / Ecological feature	Value	Screening
North Bull Island SPA [004006]	International	Screened out (JBA, 2022 - AA Screening)
South Dublin Bay and River Tolka Estuary SPA [004024]	International	Screened out (JBA, 2022 - AA Screening)
Lugmore Glen pNHA [001212]	National	Screened out (lack of hydrological connectivity/distance)
Dodder Valley pNHA [000991]	National	**Screened in**
Slade of Saggart and Crooksling Glen pNHA [000211]	National	Screened out (lack of hydrological connectivity/distance)
Glenasmole Valley pNHA [001209]	National	Screened out (lack of hydrological connectivity/distance)
Dolphins, Dublin Docks pNHA [000201]	National	Screened out (lack of hydrological connectivity/distance)
North Dublin Bay pNHA [000206]	National	Screened out (lack of hydrological connectivity/distance)
South Dublin Bay pNHA [000210]	National	Screened out (lack of hydrological connectivity/distance)
Buildings and artificial surfaces	Less than local	Screened out
Recolonising bare ground	Less than local	Screened out
Eroding / upland rivers	County	**Screened in**
Amenity (improved) grassland	Less than local	Screened out
Dry meadows and grassy verges	Low Local	**Screened in**
Scrub	Low Local	**Screened in**
Otter	County	**Screened in**
Hedgehog	High Local	**Screened in**
Bats - Common Pipistrelle; Soprano Pipistrelle; Leisler's Bat; and *Myotis* spp.	High Local	**Screened in**
Birds - Mallard, Grey Wagtail and Starling and other species within the locality	High Local	**Screened in**
Amphibians - Common Frog	High Local	**Screened in**
Fish - European Eel	County	**Screened in**
Terrestrial Invertebrates - Large Red-tailed Bumblebee	High Local	**Screened in**

5 Other Relevant Plans and Projects

5.1 Cumulative Impacts

Potential sources of cumulative impacts were identified based on the ecology of valued ecological features. Potential sources of cumulative impacts were sought within an area where there is the potential for a significant impact on identified ecological features.

The following projects or plans were identified as potential sources of cumulative impacts:

- South Dublin County Council Development Plan 2016 - 2022
- River Basin Management Plan for Ireland 2018-2021
- Planning Applications (2019 - February 2022)

5.2 Plans

5.2.1 South Dublin County Council Development Plan 2016 - 2022

The South Dublin County Council (SDCC) Development Plan sets out an overall strategy for the proper planning and sustainable development of the County. The objectives include a target of increased population and continuing the consolidation of established urban areas, to support and facilitate economic activity and to promote the ease of movement by sustainable modes (walking, cycling and public transport). The Plan also aims to protect and enhance surface water quality, to support, improve and protect Natura 2000 sites, and to develop an integrated Green Infrastructure network to enhance biodiversity, provide accessible parks, open spaces and recreational facilities (SDCC, 2016a). The plan also states that work will be in conjunction with Irish Water to protect existing water and drainage infrastructure, to promote investments aiming to support environmental protection and facilitate the sustainable growth of the county (SDCC, 2016a).

A Screening for Appropriate Assessment was carried out on the plan. This concluded that there are no likely significant direct, indirect or secondary impacts of the project on any Natura 2000 sites (SDCC, 2016b), **therefore the South Dublin County Council (SDCC) Development Plan is not anticipated to contribute to cumulative or in-combination effects.**

5.2.2 River Basin Management Plan for Ireland 2018-2021

The 2nd cycle River Basin Management Plan (RBMP) for Ireland 2018-2021 sets out the actions that Ireland will take to improve water quality and achieve 'good' ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2021 (DoHPLG, 2018a). Changes from previous River Basin Management Plans is that all River Basin Districts are merged as one national River Basin District. The Plan provides a more coordinated framework for improving the quality of our waters — to protect public health, the environment, water amenities and to sustain water-intensive industries, including agri-food and tourism, particularly in rural Ireland.

The first cycle of River Basin Management Plans included the Eastern River Basin District - River Basin Management Plan 2009 – 2015 (WFD, 2010).). The plans summarised the waterbodies that may not meet the environmental objectives of the WFD by 2015 and identified which pressures are contributing to the environmental objectives not being achieved. The plans described the classification results and identified measures that can be introduced in order to safeguard waters and meet the environmental objectives of the WFD;

- Prevent deterioration of water body status.
- Restore good status to water bodies.
- Achieve protected areas objectives.
- Reduce chemical pollution of water bodies

The River Basin Management Plan for Ireland (2018-2021) outlines the new approach that Ireland will take to protect our waters over the period to 2021. It builds on lessons learned from the first planning cycle in a number of areas:

- stronger and more effective delivery structures have been put in place to build the foundations and momentum for long-term improvements to water quality
- a new governance structure, which brings the policy, technical and implementation actors together with public and representative organisations. This will ensure the effective and coordinated delivery of measures.

Ireland's third River Basin Management Plan 2022-2027 is due to be published in 2022. The 3rd cycle draft Catchment Reports were published in August 2021. The draft Catchment Reports provides a summary of the water quality assessment outcomes for respective catchment, including status and risk categories, significant threats and pressures, details on protected areas and a comparison between cycle 2 and cycle 3.

The draft Catchment Report for Liffey and Dublin Bay Catchment identifies an overall improvement of 5 waterbodies across the catchment since the cycle 2 assessment (Catchment Science & Management Unit, 2021). The significant pressures of the River Liffey in the downstream section are urban runoff and urban wastewater, where the impacts are a combination of nutrient and organic pollution and Ringsend agglomeration. The transitional and coastal waterbodies meet the requirements for the habitats and species of the SACs, including the Dublin Bays SACs. Specific water supporting conditions have not been identified for the dependent bird species in the SPAs and so waterbodies associated with SPAs are not included in the assessment, though for Dublin Bay they overlap with the SACs.

The River Basin Management Plan for Ireland 2018-2021 is not anticipated to contribute to cumulative or on-combination effects.

5.3 Other Projects

Since 2019, the projects listed (Table 5-1 overleaf), which are not retention applications, home extensions and/or internal alterations, have been granted planning permission in the locality of the proposed site.

Table 5-1: Projects granted planning permission since January 2019 in vicinity of proposed site.

Planning Reference	Address	Application Status	Decision date	Summary of development
SD21A/0207	St. Thomas' Junior National School, Jobstown, Tallaght, Co. Dublin	Permission granted	14/09/2021	Demolition of the existing single-storey c. 2,605sq.m. Junior School building; demolition of the existing single-storey c. 211sq.m. Junior School ancillary structures; construction of a new part three/part two-storey c. 4,998sq.m - Junior School building, located to the west of the existing Senior School building. The new school will accommodate 27 classrooms, a 3-class base Special Education Needs facility and all ancillary accommodation (the Senior School does not form part of planning application); 2 single-storey temporary accommodation units, c. 400sq.m, located to the south of the site, to facilitate the construction of the new school building; renewable energy design measures, PV Panels and/or heat pumps located at roof level; new school signage comprising wall-mounted lettering on the front elevation of the new building; external hard play area and 2 Multi-Use Games Areas; all located to the south of the site; redevelopment of the existing staff car parking and set-down facilities within the school site comprising: provision of 40 Junior school staff car parking spaces and 6 car set-down spaces, resurfacing of 22 existing Senior school car parking spaces, 106 bicycle parking spaces, new access road, new footpaths, landscaping and all ancillary site works; boundary treatment comprising of repair works to the existing low-level blockwork wall and new metal railings to an overall height of 2.4m along Fortunestown Road; replacement of the existing palisade fencing with new 2.4m high railings along Kiltalown Park Rd to the south; replacement of the existing pedestrian and vehicular entrance gates; works in the public road outside the school site: including 5 set-down spaces along Fortunestown Road, and services connection required to facilitate the development.
SD19A/0173	Scoil Cnoic Mhuire Junior School, Knockmore Avenue, Killinarden, Dublin 24	Permission granted	25/07/2019	Construction of a single storey link corridor in the south west corner of the existing school building; installation of new windows to the perimeter of the building to facilitate a proposed new internal layout and other ancillary works.
SD218/0004	Whitestown and Killinarden, Tallaght, Dublin 24	Application Under Part 8	N/A	Killinarden Park upgrade, total site area approx. 20ha and Greenway with landscaped pedestrian/cycle route within Killinarden Park and between Killlinarden Park and Sean Walsh Park, total site area approx. 4.50ha. The works will comprise: • Strategic walk/cycleway with bat sensitive lighting along Whitestown Stream; new and enhanced entrances, including new road crossings at Killinarden Heights , Whitestown Drive, Whitestown Way and Killinarden Way/Killinarden Estate (with a revised carriageway arrangement); feature areas at primary and secondary accesses; a Primary Oval footpath and walking/exercise circuit 1km in length; existing secondary footpath network retained and resurfaced where required; and a new footbridge crossing the Whitestown Stream within the park. • Replacement and new park perimeter walls/railings where required and retention of existing private walls/railings. • Linear play trails; seating; two natural play areas; outdoor fitness and calisthenics equipment; a Multi-use Games and Skate Area; upgrade of existing grass sports pitches to include re-levelling where required. • Biodiversity and landscape improvements including a community orchard; wildflower meadows; surface water swale; willow; native woodland; informal tree groups; Signature Trees; and retention of existing tree groups and scrub where shown. • Installation of CCTV Cameras for monitoring by An Garda Siochána and South Dublin County Council. • All ancillary works. The proposal has undergone Appropriate Assessment Screening under the Habitats Directive (92/43/EEC) and screening for Environmental Impact Assessment (EIA) under the EIA Directive 2014/52/EU. The Planning Authority has made a preliminary examination of the nature, size and location of the proposed development.

Planning Reference	Address	Application Status	Decision date	Summary of development
				The authority has concluded that there is no real likelihood of significant effects on the environment arising from the proposed development and a determination has been made that an EIA is not required. Any person may, within 4-weeks from the date of publication of this notice, apply to An Bord Pleanála for a screening determination as to whether the development would be likely to have significant effects on the environment. The plans and particulars of the proposed development are available for inspection online on the Council's Public Consultation Portal website (http://consult.sdublincoco.ie) during the period from 6th May 2021 to 17th June 2021. Due to Covid-19 restrictions, persons wishing to inspect printed plans and particulars of the proposed development must make an appointment by emailing planningdept@sdublincoco.ie or by phoning (01) 4149000. After making an appointment, printed plans and particulars will be available for inspection or purchase at a fee not exceeding the reasonable cost of making a copy at County Hall, Tallaght, Dublin 24 during office hours from 6th May 2021 to 3rd June 2021. Submissions or observations with respect to the proposed development dealing with the proper planning and sustainable development of the area in which the proposed development will be situated may be made in writing up to 5pm on 17th June 2021 and may be submitted either via: Online Submissions: http://consult.sdublincoco.ie or Post to: A/Senior Executive Officer, Project Delivery Unit, Corporate Performance and Change Management, South Dublin County Council, County Hall, Tallaght, Dublin 24 YNN5. NOTE: Please make submission by one medium only. All submissions should include name and a contact address. It should be noted that the Freedom of Information Act, 1997-2006 (as amended) applies to all records held by South Dublin County Council. South Dublin County Council's Personal Data Privacy Statements can be viewed at www.sdcc.ie and all personal data will be retained in line with statutory requirements.

5.4 Summary of Cumulative Impacts

Developments SD21A/0207 and SD19A/0173 are lacking in direct pathways to the Whitestown Stream, and thus are not deemed to capable of acting in combination with the proposed project to impact the Natura 2000 sites within the ZoI. SD218/0004 is currently under Part 8 and is yet to be confirmed in full by SDCC. Given the nature of the SD218/0004 enhancement project, it is not anticipated that it will act in combination with Whitestown Stream enhancement works to cause adverse impacts on the Natura 2000 sites within the ZoI. The County Development Plan, RBMP and projects within the locality of the proposed project are considered in combination with the currently proposed enhancement project in the following Impact Assessment section.

6 Impact Assessment

6.1 Introduction

The impacts on the valued ecological features are assessed here. The initial assessment considers the potential impact pathways and whether these apply to the ecological features. The impact assessment considers the project and the anticipated effects in the absence of any mitigation.

The potential impacts from the enhancement works are assessed under the following:

- Disturbance to habitats and species
- Impacts on water quality

The following sections describes the nature of immediate / short-term impacts, as well as any medium- or long-term impacts, predicted for designated protected sites, habitats and species in the absence of implemented mitigation measures during the maintenance works.

6.2 Do Nothing Scenario

If the proposed works were not to go ahead and the present land management continues as is, the ecological value of the site would remain unchanged.

6.3 Designated Sites

Given that the designated site, i.e., the Dodder Valley pNHA screened into the impact assessment is located downstream of the proposed enhancement works, the main concern would be the accidental introduction of pollutants (e.g., hydrocarbon leakages from site machinery) into the Whitestown Stream. While the habitats present within this designated site are unlikely to be impacted by a small-scale pollution event, individuals amongst the protected species populations (e.g., Otter; Little Grebe; Kingfisher; Grey Wagtail; and Sand Martin) which inhabit the pNHA are also likely to be present in supporting habitats, further upstream, closer to the source of the pollution, therefore increasing the likelihood of impact on individuals within these protected populations.

6.4 Habitats & Species

6.4.1 Eroding / upland rivers - Inhabiting fauna (Otter; Mallard; Grey Wagtail; Common Frog; and European Eel)

For the eroding / upland rivers habitat (Whitestown Stream); the main impact concerns would be that of an accidental introduction of pollutants (hydrocarbon leakages from site machinery); cement leachate; and excess sediment from the demolition / removal, excavations and soil works. These polluting inputs would lead to the degradation of the Whitestown Stream, as well as the protected aquatic / riverine species that it supports, notably Otter; Mallard; Grey Wagtail; Common Frog; and European Eel. Therefore, in the absence of surface water-based mitigation during the construction phase, minor adverse impacts are anticipated for the eroding / upland river habitat; Otter; and European Eel; while negligible adverse impacts are anticipated for Mallard, Grey Wagtail; and Common Frog.

Operational impacts through the surface water pathway are not anticipated given the operational nature of the enhancement site.

6.4.2 Dry meadows and grassy verges; Scrub - Inhabiting fauna (Hedgehog; Mallard; Grey Wagtail; Starling and Common Frog)

The small linear strips dry meadow grassland and scrub habitats would be vulnerable to any polluting events which may occur within the site. Furthermore, minor impacts will have a knock-on effect on the protect faunal species which frequent this habitat for commuting, foraging or refuge purposes, e.g., Hedgehog; Mallard; Grey Wagtail; Starling; and Common Frog.

Operational impacts from the enhancement works on these habitats and species are not anticipated.

6.4.3 Otter and Hedgehog (General Disturbance)

While no signs of Otter and Hedgehog habitation were present during the ecological walkover, this does not ensure that the local mammal species do not occasionally visit the site area for foraging and commuting purposes. Bearing this in mind, impacts may arise in the form of disturbance to foraging and

commuting activities, as well as potential loss of life to individuals in the case of accidents within the construction site (e.g. accidental trappings), after failure to exclude entry.

Operational impacts from the enhancement works on these species are not anticipated.

6.4.4 Bats

The four bat species that are potentially using the site are likely only utilising it for commuting and opportunistic foraging.

The proposed enhancement works are not anticipated to have an adverse impact on population numbers of the bat species identified as using the site, as there will be no reduction in potential roosting locations due to the proposed development. The site currently has low to moderate foraging and commuting suitability for bats given the variety of habitats present on-site, including a watercourse. However, potential minor impacts on individuals using the site could be posed by external lighting during construction phase.

Adverse lighting impacts during construction will be temporary. The enhancement works will involve an increase in the number lampposts within the site, however, the lighting heights and specifications are tailored to be bat-friendly, particularly in the vicinity of the Whitestown Stream riparian area; thus, ensuring the continued utilisation of the site by bats. Therefore, operational impacts from the enhancement works on these species are not anticipated.

6.4.5 Terrestrial Invertebrates

The foraging and commuting activities of the Large Red-tailed Bumblebee will be adversely impacted as result of the enhancement works. These temporary minor impacts on a locally important ecological feature will have an overall negligible impact.

Operational impacts from the enhancement works on this species is not anticipated.

6.5 Invasive Non-native Species

Given the absence of invasive non-native species within or adjacent to the proposed site, adverse impacts from this problematic species grouping are not anticipated during the construction and operational phases of this enhancement project.

6.6 Summary

The following potential significant impacts have been identified below, with the necessary mitigation is discussed in the next chapter:

- Adverse surface water-based impacts on protected faunal species associated with the River Dodder pNHA downstream of the site.
- Pollution of the eroding / upland river habitat (Whitestown Stream) and the protected species it hosts (i.e., Otter; Mallard; Grey Wagtail; Common Frog; and European Eel).
- Degradation of dry meadow grassland and scrub habitats via pollution events; reducing the capacity of these habitats to support local wildlife.
- Disturbance of commuting and foraging terrestrial mammals, bat species, birds and amphibians, as well as potentially accidental fatal entrapment for these faunal groups.
- Foraging and commuting disturbance during works to the local Large Red-tailed Bumblebee populations.

The mitigation is based on existing guidance documentation and where necessary additional mitigation is proposed to reduce the impacts identified above.

7 Mitigation

The following mitigation is recommended to ensure that the proposed works do not adversely impact on the ecological receptors outlined in Section 6.

Mitigation measures for anticipated impacts on designated sites and ecological features are outlined below.

7.1 Mitigation for Project Construction Phase

The activities of the project for the construction phase shall remain within the boundary of the proposed site. Within this area, the mitigation measures outlined below shall be implemented.

- A Construction and Environment Management Plan (CEMP) will be submitted to South Dublin County Council for agreement prior to site works commencing. This CEMP will incorporate the mitigation measures listed here.
- The CEMP will also strictly adhere to best practice environmental guidance including but not limited to the following:

  - CIRIA Guidance C532 Control of water pollution from construction sites. Guidance for consultants and contractors. (CIRIA, 2019 - www.ciria.org);

  - CIRIA Guidance C741: *Environmental good practice on site guide* (Charles & Edwards, 2015; CIRIA, 2019 - www.ciria.org);

  - CIRIA Guidance C750D: *Groundwater control: design and practice* (Preene *et al.*, 2016; CIRIA, 2019 - www.ciria.org);

  - Inland Fisheries Ireland (2016) *Guidance on Protection of Fisheries During Construction Works In and Adjacent to Waters;*

  - Inland Fisheries Ireland (2020) Planning for Watercourses in the Urban Environment. A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning
- Construction method statements will be submitted to South Dublin County Council for agreement prior to site works commencing.

7.1.1 Site Compound

- The works compound will be sited as far from the Whitestown Stream as reasonably possible in order to minimise any potential impacts.
- Only plant and materials necessary for the construction of the works will be permitted to be stored at the compound location.
- Site establishment by the Contractor will include the following:

  - Site offices;

  - Site facilities (canteen, toilets, drying rooms, etc.);

  - Office for construction management team;

  - Secure compound for the storage of all on-site machinery and materials;

  - Temporary car parking facilities;

  - Temporary fencing;
- Site Security to restrict unauthorized entry;
- Bunded storage of fuels and refuelling area. Bunds shall be 110% capacity of the largest vessel contained within the bunded area.
- A separate container will be located in the Contractors compound to store absorbents used to contain spillages of hazardous materials. The container will be clearly labelled, and the contents of the container will be disposed of by a licenced waste contractor at a licenced site. Records will be maintained of material taken off site for disposal.

- A maintenance programme for the bunded areas will be managed by the site environmental manager. The removal of rainwater from the bunded areas will be their responsibility. Records will be maintained of materials taken off site for disposal.
- The site environmental manger will be responsible for maintaining all training records.
- Drainage collection system for washing area to prevent run-off into surface water system.
- Wherever reasonably practical, refuelling of vehicles will be carried out off site to reduce risk of accidental hydrocarbon pollution events.

7.1.2 Water Quality

Relevant legislation and best practice guidance that have been considered includes but not limited to the following:

- Water Framework Directive (2000/60/EC);
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009;
- Local Government (Water Pollution) Acts 1977-1990;
- CIRIA C532 *Control of water pollution from construction sites*. Guidance for consultants and contractors. (www.ciria.org);
- CIRIA Guidance C750D: *Groundwater control: design and practice* (Preene *et al.*, 2016) (www.ciria.org);
- Inland Fisheries Ireland 2016 *Guidance on Protection of Fisheries During Construction Works In and Adjacent to Waters;*
- CIRIA C515 Groundwater control – design and practice, 2nd ed. (CIRIA, 2021 - www.ciria.org)
- CIRIA Guidance C741: *Environmental good practice on site guide* (Charles & Edwards, 2015; CIRIA, 2020 - www.ciria.org)
- Oil booms and oil soakage pads should be maintained on-site to enable a rapid and effective response to any accidental spillage or discharge. These shall be disposed of correctly and records will be maintained by the environmental manager of the used booms and pads taken off site for disposal.
- Fail-safe site drainage and bunding through drip trays on plant and machinery will be provided to prevent discharge of chemical spillage from the sites to surface water.

To prevent watercourse pollution:

- Adoption of a surface water plan including appropriate barrier controls to prevent any polluted surface water from the site reaching the marine environment.
- Minimise area of exposed ground by maintaining existing vegetation in vicinity of site compound/pier infrastructure.
- Oil booms and oil soakage pads should be maintained on-site to enable a rapid and effective response to any accidental spillage or discharge. These shall be disposed of correctly and records will be maintained by the environmental manager of the used booms and pads taken off site for disposal.
- Fail-safe site drainage and bunding through drip trays on plant and machinery will be provided to prevent discharge of chemical spillage from the sites to surface water.
- Any accidental discharge will be controlled by use of oil booms in the water prior to construction starting.
- The installation of geotextile sandbag stream dams 10m upstream and downstream of the bridge demolition and installation sites. The artificial streambed and lower banks of the Whitestown Stream are well suited to damming. This will create a dry cell area in which works can be completed, thus minimising the pollution risk to the Whitestown Stream. In order to allow the continued flow of the Whitestown Stream, water will have to pumped overland from the dammed upstream section to the downstream. Any polluting material or debris will be removed from the dry cell areas before normal flow is returned to the Whitestown Stream.

- The installation of silt fences (see Figure 7-1) along the bank sections of the Whitestown Stream which have not been subjected to the damming / dry cell procedure. This must be completed prior to performing any movement of soil or footpath excavation / construction on-site, in order to prevent any uncontrolled flow of surface water run-off (with high sediment loading) from the site into the Whitestown Stream.

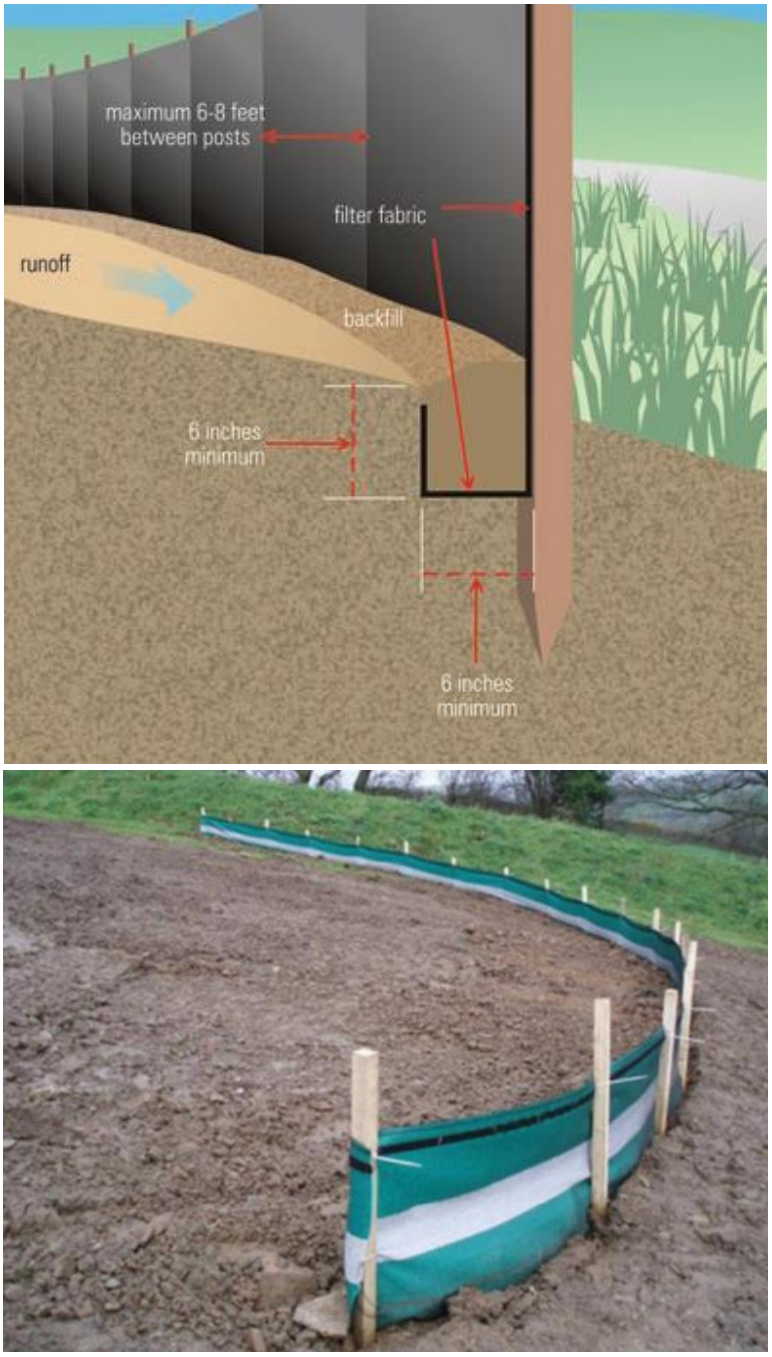

Figure 7-1: Example of suitable silt fence mitigation ensuring maximum safeguarding efficiency

7.1.3 Installation of Geotextile Dams (dry cell areas); and Silt Fences

In order to ensure the safeguarding of the Whitestown Stream, the presence of an Ecological Clerk of Works (ECoW) will be required during the initial installation of the geotextile sandbag dams within the Whitestown Stream. The ECoW will also conduct a structural integrity check of the silt fences following their initial installation along sections of the Whitestown Stream.

7.1.4 Concrete Management Procedures

Concrete will be used for formation of new concrete bridge features. The following measures will be implemented to prevent liquid concrete/cement entering the aquatic environments.

- Wherever reasonably possible, pre-cast concrete bridge features should be utilised to minimise the risk of a concrete-based pollution event.
- Concrete delivery, concrete pours and related construction methodologies will be part of the procedure agreed with the contractor to mitigate any possibility of spillage or contamination of the local environment. Particular attention will be paid during the pouring process in order to avoid leakages or spills of concrete.
- Washout of concrete plant will occur off site at a designated impermeable area with waste control facilities.
- Raw, uncured or waste concrete will be stored appropriately prior to disposal by licenced contractor.
- The contractor's construction methodology will require the use of precast elements where practical; the use of secondary protection shuttering for concrete pours; all pours to be carried out in dry weather conditions; and that all trucks be cleaned prior to leaving respective depots.
- The contractor will be required to use experienced operators for the work; provide an appropriate level of continuous monitoring during any concrete pours by experienced management; and have method statements approved by the client prior to commencing works. Works will be carried out using recommendations from current guidance and relevant codes of practise as outlined in **EA (2011) -** *Managing concrete wash waters on construction sites: good practice and temporary discharges to ground or to surface waters*.

7.1.5 Pollution Control and Spill Prevention

Spill kits containing absorbent pads, granules and booms will be stored in the site compound with easy access for delivery to site in the case of an emergency. A minimum stock of spill kits will be maintained at all times and site foremen's vehicles will carry large spill kits at all times. Absorbent material will be used with pumps and generators at all times and used material disposed of in accordance with the Waste Management Plan. All used spill materials e.g., Absorbent pads will be placed in a bunded container in the contractor's compound. The material will be disposed of by a licenced waste contractor at a licenced facility. Records will be maintained by the environmental site manager.

Regular inspections and maintenance of plant and machinery checking for leaks, damage or vandalism will be made on all plant and equipment.

In the event of a spill the Contractor will ensure that the following procedure are in place:

- Emergency response awareness training for all Project personnel on-site works.
- Appropriate and sufficient spill control materials will be installed at strategic locations within the site. Spills kits for immediate use will be kept in the cab of mobile equipment.
- Spill kits will be stored in the site compound with easy access for delivery to site in the case of an emergency. A minimum stock of spill kits will be maintained at all times and site vehicles will carry spill kits at all times. Spill kits must include suitable spill control materials to deal with the type of spillage that may occur and where it may occur. Typical contents of an on-site spill kit will include the following as a minimum:

  - Absorbent granules;

  - Absorbent mats/cushions;

  - Absorbent booms

  -Track-mats, geotextile material and drain covers.
- All potentially polluting substances such as oils and chemicals used during construction will be stored in containers clearly labelled and stored with suitable precautionary measures such as bunding within the site compound.
- All tank and drum storage areas on the site will, as a minimum, be bunded to a volume not less than the following;

  - 110% of the capacity of the largest tank or drum within the bunded area, or

- 25% of the total volume of substances which could be stored within the bunded area.

- The site compound fuel storage areas and cleaning areas will be rendered impervious and will be constructed to ensure no discharges will cause pollution to surface or ground waters.
- Designated locations for refuelling are within Site Compound.
- Potentially contaminated run off from plant and machinery maintenance areas will be managed within the site compound surface water collection system.
- Damaged or leaking containers will be removed from use and replaced immediately

7.1.6 Noise and vibration

The construction of the pedestrian / cycle bridge will be limited to daylight hours where possible, ensuring minimum disturbance to commuting and foraging activities of local wildlife. The works will also be temporary. With regard to construction activities, reference will be made to BS 5228-1, which offers detailed guidance on the control of noise from demolition and construction activities. A variety of practicable noise control measures will be employed. These include:

- Erection of barriers at construction works boundary as necessary and around items such as generators or high duty compressors.
- Limiting the hours during which site activities likely to create high levels of noise are permitted. Construction activities will take place Monday to Friday, between 08:00 and 18:00, and on Saturdays, between 08:00 and 13:00.
- A site representative responsible for matters relating to noise will be appointed to liaise with South Dublin County Council.

Additional guidance relevant to acceptable vibration and noise levels will be followed and is contained in the following documents:

- British Standard BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration.
- British Standard BS 5228-2: 2009: Code of Practice for Noise and Vibration Control on Construction and Open Sites: Vibration.
- NRA: 2014: Guidelines for the Treatment of Noise and Vibration in National Road Schemes.

7.1.7 General Avoidance Measures

Although it has been identified that there will be no permanent impact through disturbance to wildlife during the work, it is advised that general avoidance measures be undertaken to protect wildlife while the works are being carried out.

General avoidance measures that should be incorporated by the contractors working on site include:

- Limit the hours of working to daylight hours, to limit disturbance to nocturnal and crepuscular animals;
- Due to the potential presence of Otter; Hedgehog; Common Frog and bat species, the use of lighting at night should be avoided. If the use of lighting is essential, then a directional cowl should be fitted to all lights to prevent light spill and to be directed away from all treelines / wooded areas.
- Contractors must ensure that no harm comes to wildlife by maintaining the site efficiently and clearing away materials which are not in use, such as wire or bags in which animals can become entangled; and
- Any pipes should be capped when not in use (especially at night) to prevent local fauna becoming trapped. Any excavations (including the dry cell area) should be covered overnight to prevent animals from falling and getting trapped. If that is not possible, a strategically placed plank should be placed to allow animals to escape.

7.1.8 Site Lighting Design

Hours of illumination during works and operational phases:

Site lighting should be switched off or at lower light output during dusk; this would benefit the bats foraging and/or commuting in the locality.

SDCC lighting engineers' design is compliant with this bat mitigation element.

Light levels and type:

Construction site lighting that meets the lowest light levels permitted under health and safety would be preferable for bats in the vicinity. The specification and colour of light treatments, such as single bandwidth lights and no UV light are essential. LED luminaires are ideal and should be used where possible due to their sharp cut-off, lower intensity, and dimming capability. A warm white spectrum (2700K – 3000K) should be used in the lighting located along the boundaries of the site to reduce the blue light component.

SDCC lighting engineers' design is compliant with this bat mitigation element.

Column heights of lamp posts:

As bats most likely forage in the unlit areas surrounding the site, the introduction of new lighting as a result of the new development, with accompanying light spillage, is anticipated to result in the bats becoming averse to commuting and foraging within the proposed site and potentially the adjacent habitats also. In order to reduce the amount of light spillage where it is not needed, the height of lamp columns should be restricted. A height of 6m or less is necessary to avert lighting impacts.

SDCC lighting engineers' design is compliant with this bat mitigation element.

Dark corridors (Construction and Operational Phases):

Taking into consideration all of the above recommended mitigation measures, a dark corridor (lighted in a bat-friendly manner) leading from one end of the site to the other, should be maintained for bats at all times. This will allow for bats commuting through the site to do so safely. This dark corridor will take the form of the Whitestown Stream riparian corridor, with only negligible breaks in the corridor at the two new bridge areas.

SDCC lighting engineers' design is compliant with this bat mitigation element.

7.2 Enhancement features for Operation Phase

7.2.1 Supplementary Tree Planting

The proposed supplementary tree planting will help enhance floral diversity within the site. The tree blossoms will improve the area for terrestrial invertebrates, including the local Large Red-tailed Bumblebee population. Additionally, the trees once mature will provided ample nesting opportunities for local bird species. Furthermore, the increased invertebrate presence as a result of the new trees will provided additional prey items for insectivorous bird species, as well as the local bat populations.

7.2.2 Seasonally Riparian Meadow Strip (Recommended)

A seasonally cut (once or twice a year) riparian meadow strip on both banks of the Whitestown Stream, measuring approximately 2m in width, could notably add to the biodiversity of the site with increased floral and faunal diversity. These dry meadow strips would increase the wildlife corridor functionality of the Whitestown Stream; and support a greater diversity of invertebrate life, which in turn draws in small mammals, bats and birds.

8 Residual Impact

Residual ecological impacts are those that remain once the development proposals have been implemented. The main aim of ecological mitigation, compensation and enhancement is to minimise or eliminate residual impacts.

8.1 Construction Phase

Preparatory and construction works will result in disturbance to the foraging and commuting habitat for protected species such as ground-dwelling mammals, bats, birds, amphibians and terrestrial invertebrates.

Implementation of mitigation measures during the construction works phase, along with good site management and construction practices will help to minimise any significant and/or permanent impact on the environment. This will be included in a Construction Environmental Management Plan (CEMP). Included in this will be best practice measures for visual and audible disturbance, as well as control of surface, which will minimise any significant impact on the surface water systems and the species reliant on them.

With the proposed mitigation implemented the residual impact during the construction phase is assessed to be of temporary negative impact on account of the disturbance to habitats of high local and county level ecological importance, as well as the local protected species.

8.2 Operational Phase

The proposed enhancement of the site, i.e., tree planting and improved riparian grassland (meadow) management will help enhance the overall floral and faunal biodiversity of the site. Overall, the works will have a positive residual impact on the biodiversity within and adjacent to the site.

9 Summary of Impact Assessment

9.1 EcIA Table

Table 9-1 presents a summary of the impacts envisaged when mitigation approaches are included. Residual impacts are also described.

All other ecological impacts can be avoided, mitigated or compensated so there is no anticipated significant impact for the remaining species considered in the assessment.

Table 9-1: Summary of Impacts; Mitigations; and Significance of Residual Impacts on ecological features

Ecological Features	Impacts	Importance of Feature	Significance of impact without Mitigation	Mitigation	Significance of Residual Impacts
Dodder Valley pNHA	Accidental introduction of pollutants into the Whitestown Stream. While the habitats present within this pNHA site are unlikely to be impacted by a small-scale pollution event, the protected faunal species associated with this site are also likely to present in supporting habitats further upstream, closer to the source of the pollution, therefore increasing the likelihood of impact on individuals within these protected populations.	National	Low impact: Moderate significance	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 pertaining to the protection of surface water; and the riparian zone of the Whitestown Stream, ensuring the protection of the downstream designated site and its associated protected species.	Negligible significance during both e works and operational phases
Eroding / upland rivers (Whitestown Stream)	Accidental introduction of pollutants into the habitat, degrading its condition and its ability to support the protected species associated with the habitat.	County	Low impact: Minor significance	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 pertaining to the protection of surface water; and the riparian zone of the Whitestown Stream; and the protected species it supports.	Negligible significance during phase, followed by neutral during the operational phase
Dry meadows and grassy verges	Accidental introduction of pollutants into the habitat, degrading its condition and its ability to support the protected species associated with the habitat.	Low Local	Low impact: Negligible significance	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 pertaining to the protection of terrestrial riparian zone and surface water systems from pollution events; ensuring the protection of the dry meadow and grassy	Neutral significance during construction phase, followed by a positive residual impact during the operational phase

Ecological Features	Impacts	Importance of Feature	Significance of impact without Mitigation	Mitigation	Significance of Residual Impacts
Scrub				verge and scrub habitats; and the protected species they support. - The enhancements outlined in Sub-section 7.2.1 and 7.2.2 detailing the supplementary tree planting and the introduction of riparian meadow strips into the grassland management plan.	Neutral significance during construction and operational phases
Otter	Accidental introduction of pollutants into the habitats utilised by Otter, reducing their ability to provide refuge, safe commuting routes and foraging opportunities. Physical, visual and audible disturbance from construction works. Accidental entrapment and/or injuries caused by on-site machinery or supplies.	County	Low impact: Minor significance	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 pertaining to the protection of surface water; ensuring the protection of the refuge, commuting and foraging habitat for Otter. - The mitigations outlined in Sub-sections 7.1.6 and 7.1.7 relating to the prevention of disturbance and/or accidental entrapment of the local Otter population. - The enhancements outlined in Sub-section 7.2.1 and 7.2.2 detailing the supplementary tree planting and the introduction of riparian meadow strips into the grassland management plan.	Temporary negligible significance during construction phase, followed by neutral residual impact during the operational phase
Hedgehog	Accidental introduction of pollutants into the habitats utilised by Hedgehog, reducing their ability to provide refuge, safe commuting routes and foraging opportunities.	High Local	Low impact: Negligible significance	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 pertaining to the protection of surface water; ensuring the protection of the refuge, commuting and foraging habitat	Temporary negligible significance during construction phase, followed by a positive residual impact during the operational phase

Ecological Features	Impacts	Importance of Feature	Significance of impact without Mitigation	Mitigation	Significance of Residual Impacts
	Physical, visual and audible disturbance from construction works. Accidental entrapment and/or injuries caused by on-site machinery or supplies.			for Hedgehog. - The mitigations outlined in Sub-sections 7.1.7 and 7.1.8 relating to the prevention of disturbance and/or accidental entrapment of local Hedgehog. - The enhancements outlined in Sub-section 7.2.1 and 7.2.2 detailing the supplementary tree planting and the introduction of riparian meadow strips into the grassland management plan.	
Bats - Common Pipistrelle Soprano Pipistrelle Leisler's Bat *Myotis* spp.	Accidental introduction of pollutants into the habitats utilised by local bats, reducing their ability to provide refuge, safe commuting routes and foraging opportunities. Physical, visual and audible disturbance from construction works.	High Local	Low impact: Negligible significance	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 pertaining to the protection of surface water; and the riparian zone habitats, ensuring the protection of foraging habitats for local Common Pipistrelle; Soprano Pipistrelle; Leisler's Bat; and *Myotis* spp. populations. - The mitigations outlined in Sub-section 7.1.8 relating to the prevention of lighting impacts on local Common Pipistrelle; Soprano Pipistrelle; Leisler's Bat; and *Myotis* spp. populations - The enhancements outlined in Sub-section 7.2.1 and 7.2.2 detailing the supplementary tree planting and the introduction of riparian meadow strips into the grassland management plan.	Temporary negligible significance during construction phase, followed by neutral residual impact during the operational phase

Ecological Features	Impacts	Importance of Feature	Significance of impact without Mitigation	Mitigation	Significance of Residual Impacts
Birds - Mallard Grey Wagtail Starling Other local species	Accidental introduction of pollutants into the habitats utilised by Mallard, Grey Wagtail, Starling and other local bird species, reducing their ability to provide refuge, safe commuting routes and foraging opportunities. Physical, visual and audible disturbance from construction works. Accidental entrapment and/or injuries caused by on-site machinery or supplies.	High Local	Low impact: Negligible significance	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 pertaining to the protection of surface water; ensuring the protection of the refuge, commuting and foraging habitat by Mallard, Grey Wagtail, Starling and other local bird species. - The mitigations outlined in Sub-sections 7.1.6 and 7.1.7 relating to the prevention of disturbance and/or accidental entrapment of Mallard, Grey Wagtail, Starling and other local bird species. - The enhancements outlined in Sub-section 7.2.1 and 7.2.2 detailing the supplementary tree planting and the introduction of riparian meadow strips into the grassland management plan.	Temporary negligible impact during construction phase, followed by a positive residual impact during the operational phase
Amphibians - Common Frog	Accidental introduction of pollutants into the habitats utilised by Common Frog, reducing their ability to provide refuge, safe commuting routes and foraging opportunities. Physical, visual and audible disturbance from construction works. Accidental entrapment and/or injuries caused by on-site machinery or	High Local	Low impact: Negligible significance	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 pertaining to the protection of surface water; ensuring the protection of the refuge, commuting and foraging habitat for Common Frog. - The mitigations outlined in Sub-sections 7.1.6 and 7.1.7 relating to the prevention of disturbance and/or accidental entrapment of Common Frog. - The enhancements outlined in Sub-	Temporary negligible impact during construction phase, followed by a positive residual impact during the operational phase

Ecological Features	Impacts	Importance of Feature	Significance of impact without Mitigation	Mitigation	Significance of Residual Impacts
	supplies.			section 7.2.1 and 7.2.2 detailing the supplementary tree planting and the introduction of riparian meadow strips into the grassland management plan.	
Fish - European Eel	Accidental introduction of pollutants into the habitats utilised by European Eel, reducing their ability to provide refuge, safe commuting routes and foraging opportunities.	County	Low impact: Minor significance	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 pertaining to the protection of surface water; ensuring the protection of the aquatic habitats for European Eel.	Temporary negligible impact during construction phase, followed by neutral residual impact during the operational phase
Terrestrial Invertebrates - Large Red-tailed Bumblebee	Accidental introduction of pollutants into the habitats utilised by local terrestrial invertebrates, reducing their ability to provide refuge, safe commuting routes and foraging opportunities. Physical, visual and audible disturbance from construction works. Accidental entrapment and/or injuries caused by on-site machinery or supplies.	High Local	Low impact: Negligible significance	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 pertaining to the protection of surface water; ensuring the protection of the refuge, commuting and foraging habitat for local Small Heath; Large Red-tailed Bumblebee; Gooden's Nomad Bee; Willughby's Leafcutter Bee; Patchwork Leafcutter Bee; Mining Bee; and Moss Carder-bee populations. - The mitigations outlined in Sub-sections 7.1.6 and 7.1.7 relating to the prevention of disturbance and/or accidental entrapment of the local Large Red-tailed Bumblebee population. - The enhancements outlined in Sub-section 7.2.1 and 7.2.2 detailing the supplementary tree planting and the introduction of riparian meadow strips into the grassland management plan.	Temporary negligible impact during construction phase, followed by a positive residual impact during the operational phase

9.2 Cumulative Impacts

As there are no significant residual impacts on ecological features (following mitigation measures) from this development, there is therefore no potential for other plans or projects identified in Section 5 to act in combination with it. Therefore, significant cumulative impacts are not expected to occur on the ecological features within the proposed site.

10 Conclusion

The proposed enhancement project has been shown to potentially impact a number of different habitats with county (eroding / upland river - Whitestown Stream) and local importance (dry meadows and grassy verges; and scrub) and faunal groups (Otter; Hedgehog; Common Pipistrelle; Soprano Pipistrelle; Leisler's Bat; *Myotis* spp.; Mallard; Grey Wagtail; Starling; other local birds; Common Frog; European Eel; and Large Red-tailed Bumblebee), who's ecological importance ranges from low local to county level in the context of this site.

Based upon the information supplied, regarding the site layout and landscape plan; and provided that the development is constructed in accordance with the mitigation measures outlined above, there will be no significant impacts alone or in-combination with other projects and plans, as result of the development and associated works on the ecology and local species of the area and on any designated conservation sites.

Appendices

A Site Landscape and Lighting Plan

B Relevant Policy and Legislation

The legislation discussed below is intended as a guide only and does not replace formal legal advice.

B.1 Biodiversity Policy Guidance

'Biodiversity: The National Biodiversity Action Plan 2017-2021 (DCHG, 2017) sets out actions through which a range of government, civil and private sectors will undertake to achieve Ireland's 'Vision for Biodiversity' and has been developed in response to The Earth Summit, held in Rio de Janeiro in 1992 (UN Convention on Biological Diversity) and subsequent EU and International Biodiversity strategies and policies.

As part of the Action Plan process Local Authorities (LA) must produce Biodiversity Action Plans (BAP). BAPs highlight local biodiversity issues and set out a series of objectives and action plans for the conservation of priority species and habitats where they occur in each district or county.

B.2 Designated Sites and Nature Conservation

B.2.1 Statutory Designated Nature Conservation Sites

Sites with statutory designations receive varying degrees of legal protection under Irish statute (i.e. Wildlife Act 1976 and Wildlife (Amendment) Act (2000) and European Directives (i.e. the EC Birds Directive (2009/147/EC) and EC Habitats Directive (92/43/EC). The EU directives were transposed into Irish national law and subsequent amendments were revised and consolidated in the European Communities (Birds and Natural Habitats) Regulations 2011 and Irish Statutory Instrument 477/2011

There are a number of statutory designations used for sites of high nature conservation value in Ireland, which are applied depending upon the importance of the site in a local, regional, national or international context. These include:

- National
- Natural Heritage Area (NHA)
- Wildfowl Sanctuary
- Statutory Nature Reserve
- Refuge for Fauna
- European
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- International
- UNESCO Biosphere Reserve
- Ramsar Convention Site
- National Park (Category II) Sites

B.2.2 Non-Statutory Designations

Non-statutory sites are afforded no statutory legal protection, but are normally recognised by local planning authorities and statutory agencies as being of local nature conservation value

A proposed Natural Heritage Area (pNHA) is an area deemed to be of special interest containing important wildlife habitat and often containing rare or threatened species. They may also be selected on the basis of their geology or geomorphology.

B.2.3 Protected and Notable Species

A number of species are protected under Irish and international legislation. In Ireland, primary protection is provided under the 1976 Wildlife Act and Wildlife (Amendment) Acts (2000 & 2010) and revision 2018. Species of European importance receive additional protection in Ireland under the Birds and Natural habitats Regulations 2011.

The Flora (Protection) Order (2015) makes it illegal to cut, uproot or damage a listed species in any way. It is illegal to alter, damage or interfere in any way with their habitats.

C National Biodiversity Data Centre (2022); Kelly et al., (2015)

C.1 Recent records (within 10 years) of protected species within the 2km of the site

Common Name	Latin Name	Designation	Record Date
Mammals			
European Hedgehog	*Erinaceus europaeus*	Wildlife Act 1976 & Amendments	31/07/2020
Eurasian Otter	*Lutra lutra*	EU Habitats Directive >> Annex I and Annex IV Wildlife Act 1976 & Amendments	28/09/2021
Birds			
Little Egret	*Egretta garzetta*	EU Birds Directive >> Annex I	03/01/2021
Coot	*Fulica atra*	EU Birds Directive >> Annex II & III Birds of Conservation Concern in Ireland: Amber List	16/04/2020
Barn Swallow	*Hirundo rustica*	Birds of Conservation Concern in Ireland: Amber List	26/04/2020
Mallard	*Anas platyrhynchos*	EU Birds Directive >> Annex II & III Birds of Conservation Concern in Ireland: Amber List	Record on-site
Mute Swan	*Cygnus olor*	Birds of Conservation Concern in Ireland: Amber List	20/11/2017
Herring Gull	*Larus argentatus*	Birds of Conservation Concern in Ireland: Amber List	20/11/2017
Black-headed Gull	*Larus ridibundus*	Birds of Conservation Concern in Ireland: Amber List	20/11/2017
Starling	*Sturnus vulgaris*	Birds of Conservation Concern in Ireland: Amber List	Record on-site
House Sparrow	*Passer domesticus*	Birds of Conservation Concern in Ireland: Amber List	28/04/2016
Wood Pigeon	*Columba polumbus*	EU Birds Directive >> Annex II & III	09/05/2020
Peregrine Falcon	*Falco peregrinus*	EU Birds Directive >> Annex I	
Pheasant	*Phasianus colchicus*	EU Birds Directive >> Annex II & III	09/05/2020
Tufted Duck	*Aythya fuligula*	EU Birds Directive >> Annex II & III Birds of Conservation Concern in Ireland: Amber List	05/04/2020
Lesser Black-backed Gull	*Larus fuscus*	Birds of Conservation Concern in Ireland: Amber List	16/04/2020
Sand Martin	*Riparia riparia*	Birds of Conservation Concern in Ireland: Amber List	03/04/2021
Amphibians			
Common Frog	*Rana temporaria*	EU Habitats Directive >> Annex V Wildlife Act 1976 & Amendments	09/05/2020
Fish			
European Eel	*Anguilla anguilla*	OSPAR Convention Red Status: Critically Endangered Wildlife Act 1976 & Amendments	Kelly et al., 2015
Terrestrial Invertebrates			
Large Red-Tailed Bumble Bee	*Bombus (Melanobombus)*	Irish Red List: Near Threatened	22/05/2021

Common Name	Latin Name	Designation	Record Date
	lapidarius		
Flora			
Yellow Archangel	*Lamiastrum galeobdolon subsp. montanum*	Irish Red List: Vulnerable	27/04/2012

References

Charles, P., Edwards, P. (Eds.), 2015. Environmental Good Practice on Site Guide, Fourth edition. ed, CIRIA C, CIRIA: London.

CIEEM, 2018. 'Guidelines For Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater, Coastal and Marine'.

CIEEM, 2019. Advice note on the lifespan of ecological reports and surveys. Advice-Note.pdf. Available online at: cieem.net

DoHPLG, 2018. 'River Basin Management Plan for Ireland 2018-2021'. Available online at: https://www.housing.gov.ie/sites/default/files/publications/files/rbmp_report_english_web_version_final_0.pdf

EPA, 2022a. EPA Catchments.ie [online], Catchments.ie, Available online at: https://www.catchments.ie/maps/

EPA, 2022b. EPA Maps [online], Next Generation EPA Maps, Available online at: https://gis.epa.ie/EPAMaps/

EPA, 2017. Guidelines on the Information to Be Contained in Environmental Impact Assessment Reports DRAFT, Environmental Protection Agency. Available: http://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20Guidelines.pdf

Fossitt, J.A., 2000. A Guide to Habitats in Ireland, Heritage Council of Ireland series, Heritage Council/Chomhairle Oidhreachta: Kilkenny.

GSI, 2022. Geological Survey Ireland Spatial Resources: Map Viewer. Geological Survey Ireland. Available online at: https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228

JBA, 2021. Ecological Impact Assessment (EcIA) for the construction of an Astro Pitch at Sean Walsh Park. JBA Consulting Ireland Ltd.

JBA, 2022. Whitestream Enhancement Project - AA Screening Report. JBA Consulting Ireland Ltd.

Kelly, F.L., Matson, R., Connor, L., Feeney, R., Morrissey, E., Coyne, J. and Rocks, K., 2015. Water Framework Directive Fish Stock Survey of Rivers in the Eastern River Basin District. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland. JBA, 2021. Briggs Equipment, Ratoath, Co. Meath - Appropriate Assessment Screening Report. JBA Consulting Ireland.

NBDC, 2022. Biodiversity Maps - Map Viewer [online], National Biodiversity Data Centre Biodiversity Maps. Available: http://maps.biodiversityireland.ie/#/Map

NPWS, 2009. Proposed National Heritage Site Synopsis Portfolio. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS, 2013a. Conservation Objectives: North Dublin Bay SAC [000206]. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Available online at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000206.pdf

NPWS, 2013b. Conservation Objectives: South Dublin Bay SAC [000210]. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Available online at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000210.pdf

NPWS, 2015a. Conservation Objectives: North Bull Island SPA [004006]. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Available online at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004006.pdf

NPWS, 2015b. Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA [004024]. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Available online at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004024.pdf

NPWS, 2017a. Natura 2000 - Standard Data Form for Glenasmole Valley SAC [001209]. Department of Culture, Heritage and the Gaeltacht. Available online at: https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF001209.pdf

NPWS, 2017b. Natura 2000 - Standard Data Form for Wicklow Mountains SAC [002122]. Department of Culture, Heritage and the Gaeltacht. Available online at: https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF002122.pdf

NPWS, 2017c. Conservation Objectives: Wicklow Mountains SAC 002122. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. Available online at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002122.pdf

NPWS, 2018a. Conservation objectives for Glenasmole Valley SAC [001209]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht. Available online at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001209.pdf

NPWS, 2018b. Natura 2000 - Standard Data Form for Wicklow Mountains SAC [002122]. Department of Culture, Heritage and the Gaeltacht. Available online at: https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF002122.pdf

NPWS, 2020a. Natura 2000 - Standard Data Form for North Dublin Bay SAC [000206]. Department of Culture, Heritage and the Gaeltacht. Available online at: https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF000206.pdf

NPWS, 2020b. Natura 2000 - Standard Data Form for South Dublin Bay SAC [000210]. Department of Culture, Heritage and the Gaeltacht. Available online at: https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF000210.pdf

NPWS, 2020c. Natura 2000 - Standard Data Form for North Bull Island SPA [004006]. Department of Culture, Heritage and the Gaeltacht. Available online at: https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004006.pdf

NPWS, 2020d. Natura 2000 - Standard Data Form for South Dublin Bay and River Tolka Estuary SPA [004024]. Department of Culture, Heritage and the Gaeltacht. Available online at: https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004024.pdf

NPWS, 2021. Conservation Objectives: Wicklow Mountains SAC 002122. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. Available online at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002122.pdf

NRA, 2009. Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes, National Roads Authority, available: http://www.tii.ie/technical-services/environment/planning/Ecological-Surveying-Techniques-for-Protected-Flora-and-Fauna-during-the-Planning-of-National-Road-Schemes.pdf

Parnell, J. & Curtis, T., 2012. Webb's An Irish Flora [online], 8th ed, Trinity College Dublin. Available: http://www.corkuniversitypress.com/product-p/9781859184783.htm.

RBMP, 2018. River Basin Management Plan for Ireland 2018 -2021. Department of Housing, Planning and Local Government.

Smith, G.F., O'Donoghue, P., O'Hora, K., Delaney, E., 2011. 'Best practice guidance for habitat survey and mapping', The Heritage Council: Ireland

SDCC, 2016a. 'South Dublin County Council Development Plan 2016-2022'. Available online at: https://www.southdublindevplan.ie/sites/default/files/documents/CDP%202016-2022%20(lower%20res).pdf

SDCC, 2016b. Screening for Appropriate Assessment South Dublin County Council Development Plan 2016-2022. Available online at: https://www.southdublindevplan.ie/sites/default/files/documents/AA%20Screening%20Report%20for%20SDCC%20Development%20Plan%202016-2022%20June%202016.pdf

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