Kiltipper Park Enhancement Works

Ecological Impact Assessment

Doherty Environmental Consultants Ltd

May 2020

Ecological Impact Assessment

Kiltipper Park Enhancement Works

Kiltipper, Co. Dublin

May 2020

Document Stage	Document Version	Prepared by
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For and on behalf of

Doherty Environmental Consultant Ltd.

Prepared By: Pat Doherty

Signed: 

This report has been prepared by Doherty Environmental Consultants Ltd. with all reasonable skill, care and diligence. Information report herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is prepared for South Dublin County Council and we accept no responsibility to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

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1.0 INTRODUCTION

Doherty Environmental Consultants (DEC) Ltd. has been commissioned by South Dublin County Council to undertake an ecological impact assessment for proposed enhancement works at Kiltipper Park, Kiltipper, Co. Dublin (see Figure 1.1 for location and Figure 1.2 for aerial imagery showing the extent of the proposed works for the project).

DEC Ltd. understand that this work is to prepare an ecological assessment of the proposed development to allow the relevant information and findings to be incorporated into a planning application for the proposed scheme on the subject lands.

1.1 LEGISLATION

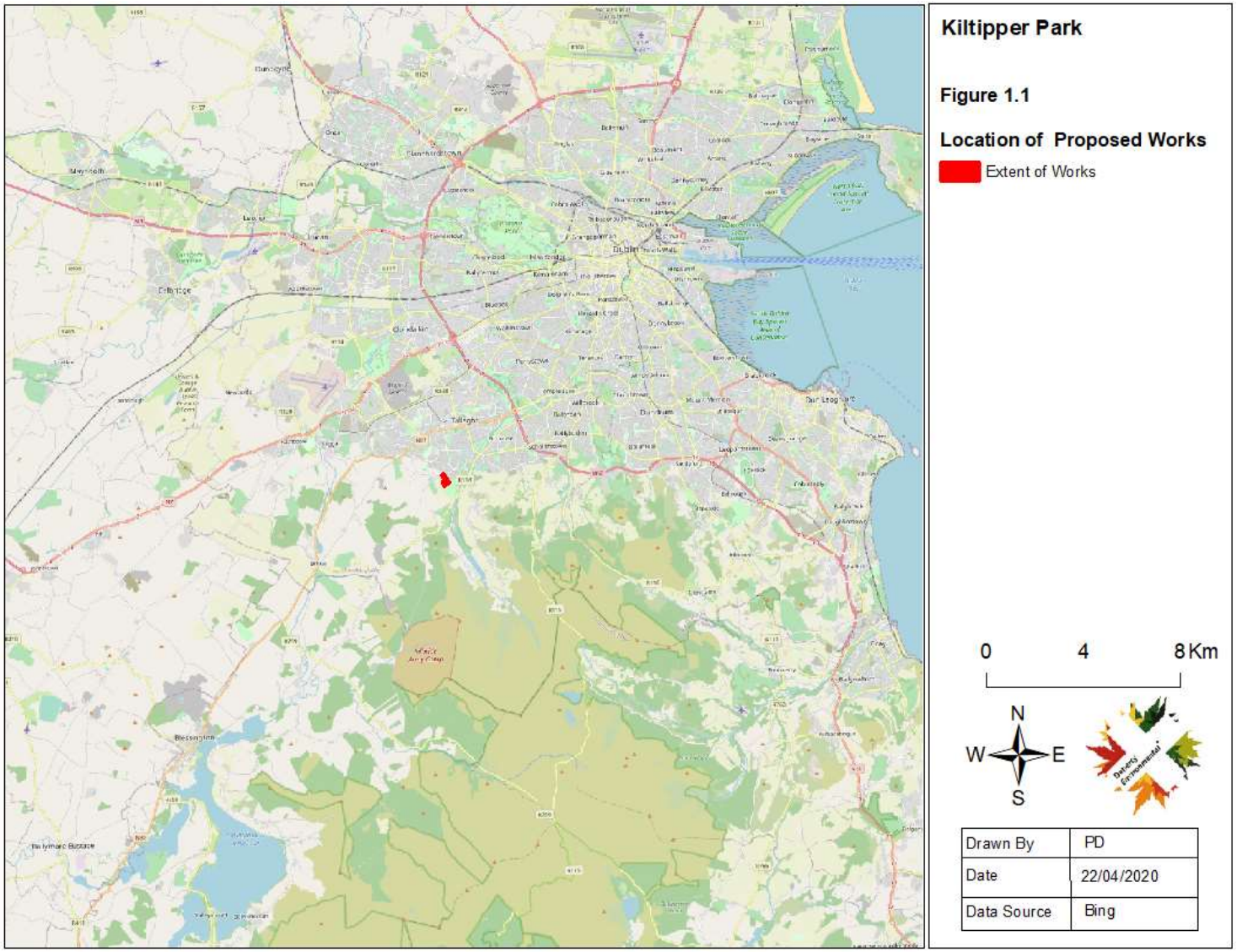
Flora and fauna in Ireland are protected at a national level by the Wildlife Act, 1976 and the Wildlife (Amendment) Act, 2000 and the Flora (Protection) Order, 1999 (SI 94/1999). They are also protected at a European level by the EU Habitats Directive (92/43/EEC) and the EU Birds Directive (79/409/EEC).

The transposition of the EU Habitats Directive by the European Communities (Natural Habitats) Regulations 1997 – 2011 (referred to as the Habitat Regulations) provides the legal basis for the protection of habitats and species of European importance in Ireland.

The legislative protection of habitats and species provided by the Habitats Directive has been implemented in Ireland and throughout Europe through the establishment of a network of designated conservation areas known as the Natura 2000 (N2K) network (with individual sites being referred to as Natura 2000 Sites). The N2K network includes sites designated as Special Areas of Conservation (SACs), under the EU Habitats Directive and Special Protection Areas (SPAs) designated under the EU Birds Directive. SACs are designated in areas that support habitats listed on Annex I and/or species listed on Annex II of the Habitats Directive. SPAs are designated in areas that support: 1% or more of the all-Ireland population of bird species listed on Annex I of the EU Birds Directive; 1% or more of the population of a migratory species; and more than 20,000 waterfowl. Under the National Habitat Regulations all designated Natura 2000 Sites are referred to as European Sites.

The Wildlife Act 1976 (as amended) also provides for the statutory designation of nature conservation areas. These areas are referred to under the Wildlife Acts as Natural Heritage Areas and are designated in areas that support habitats and/or species of national importance. Other relevant national legislation concerning the protection of flora, fauna and fisheries include the:

- Planning Act 2010;
- European Communities (Quality of Salmonid Waters) Regulations, 1988;
- The Freshwater Fish Directive 1978 (78/659/EEC); and
- The Surface Water Regulations, 2009.


Kiltipper Park
Figure 1.1
Location of Proposed Works
Extent of Works
0
4
8 Km
N
W
E
S
Drawn By
PD
Date
22/04/2020
Data Source
Bing


Kiltipper Park
Figure 1.2
Aerial of Site Location
Overall Boundary
0
0.1
0.2 Km
N
W
E
S
Drawn By
PD
Date
22/04/2020
Data Source
Bing

2.0 PROJECT DESCRIPTION

2.1 OVERVIEW OF THE PROJECT

The proposed Kiltipper Park Enhancement Works will include the following features:

- Adjustments to existing carpark including lengthened access roadway, adjustments to pedestrian access footway and increased carpark capacity by 30 no. additional car parking spaces
- Circa 120m of new shared entrance and surface access pathway
- Extension to the existing car park at the north of the park
- Provision of 1 no. GAA pitch with vertical ball-stop netting and associated features
- Provision of 2 no. soccer pitches and associated features
- Provision of children's playground area and linear natural play areas
- Provision of an orientation table
- Provision of access to the River Dodder
- Integrated soft landscaping features including:
    - Native woodland planting areas
    - Native pine woodland planting area
    - Wetland swale planting areas
    - Wetland planting areas
    - Wildflower meadow planting areas
    - The provision of a proposed landscape berm
    - The provision of shallow grassland mounds
    - The provision of a tree planting throughout the park

All elements of the above works are shown on Figure 2.1.

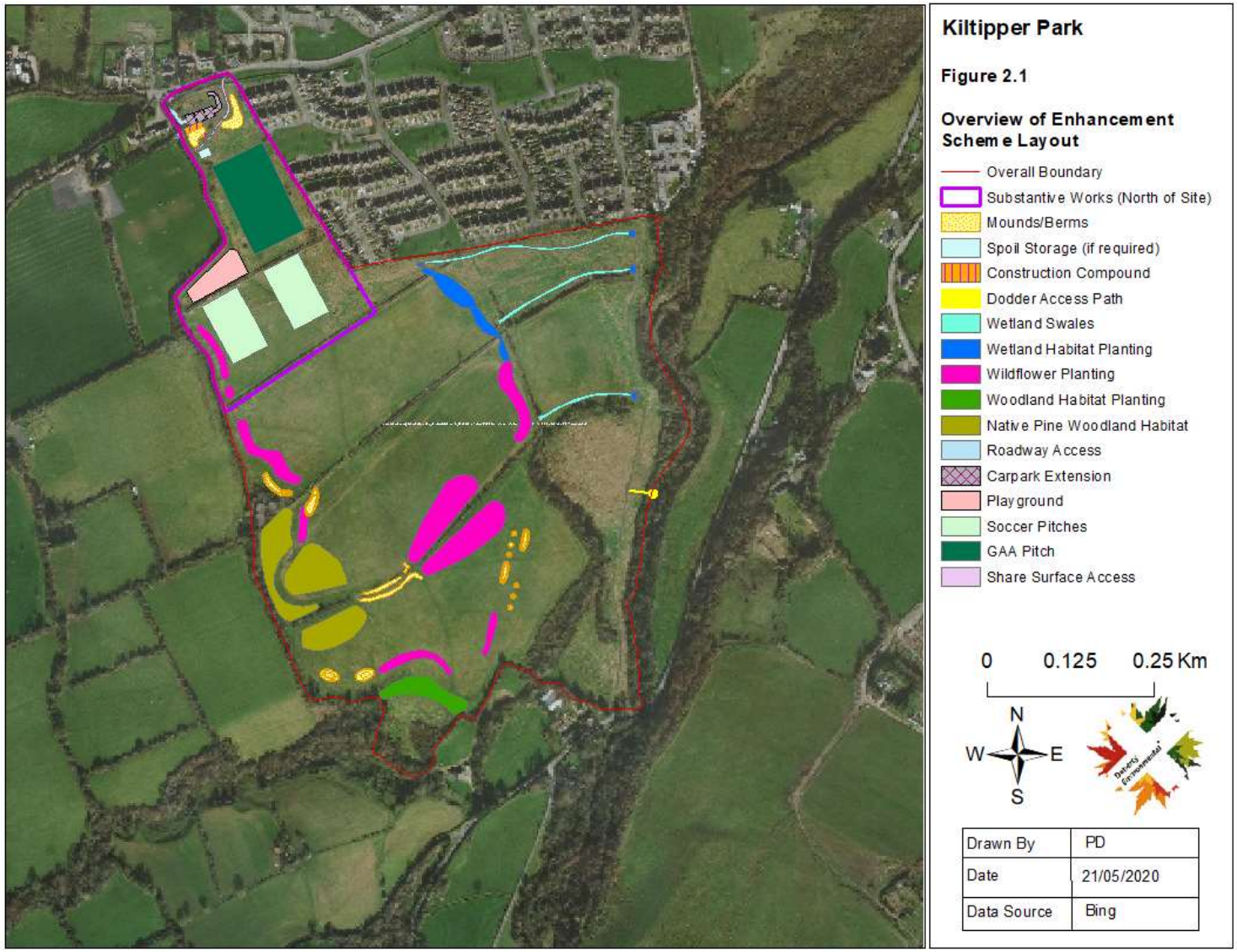
2.2 STORM WATER DRAINAGE

Storm water will be managed through the implementation of the following design measures:

- Carpark – Permeable surfacing comprising open grid surface with filter drain below carpark which will discharge into a swale. In storm conditions the swales will overtop into an existing surface water drainage along the Kiltipper Road which falls eastwards in parallel to the Dodder River. The roadside drain eventually discharges storm water to the River Dodder in the vicinity of the R113 in Old Bawn.

- The remainder of the greenfield runoff will be captured in existing field drains and ditches.

- Pitch drainage will be captured into swales and wetlands that are to be provided as part of the landscape design for the project.


Kiltipper Park
Figure 2.1
Overview of Enhancement Scheme Layout
Overall Boundary
Substantive Works (North of Site)
Mounds/Berms
Spoil Storage (if required)
Construction Compound
Dodder Access Path
Wetland Swales
Wetland Habitat Planting
Wildflower Planting
Woodland Habitat Planting
Native Pine Woodland Habitat
Roadway Access
Carpark Extension
Playground
Soccer Pitches
GAA Pitch
Share Surface Access
0 0.125 0.25 Km
N
W E
S
Drawn By PD
Date 21/05/2020
Data Source Bing

2.3 PLANT & CONSTRUCTION MATERIALS REQUIRED

The type of plant and machinery required will be typical civil engineering road construction plant for earthworks and paving, and is likely to include:

- 360 degree 20 tonne Excavators (crawler track machines)
- Rubber-tyred Excavators 6 tonne JCB
- 3 tonne Mini Diggers
- 30 tonne Dump Trucks
- 6 tonne Dumpers
- 7.5 tonne multi-purpose truck
- 20 tonne and 30 tonne delivery trucks (importation of rock and bitumenous paving materials)
- Teleporter for erection of lighting columns
- Site Vehicles (4x4 wheel short base and vans)
- Compactor plates
- 1 tonne hand roller
- 6 tonne vibrating Rollers
- 10 tonne dead weight rollers
- Blawknox Paving Machine
- Bitumen Boiler/Hot Box
- Oil Tanker/Sprayer
- Road Planing Machine

- Extruded Kerb Laying Machine
- Road Saws/Con Saws/chain saws
- Bark Mulchers
- Air Compressors
- Jack Hammers
- Stihl Saws
- Small tools/hand tools
- Traffic Management Signs, Cones & Barriers
- Herras Fencing
- Mobile Traffic Lights
- Road Sweeper & Water Tank Truck
- PPE

All machinery will be inspected and certified to be free of leaks and weeps prior to mobilisation on site.

The materials will be typical civil engineering road construction materials consisting of cement, sand, gravel of various aggregate sizes, imported and reused top soil, precast concrete kerbs, manhole bases, covers, precast concrete culverts, pipes, precast concrete services chambers, PVC-u ducts & chambers, PVC-u drainage channels with galvanised steel covers, galvanised metal chamber covers, galvanized, powder-coated street lighting columns and traffic signal poles, galvanised steel sign posts and metal traffic signs, bituminous road paving materials, thermoplastic road marking materials, LED lighting lanterns & electrical equipment, traffic signals & controller electronic equipment, galvanised metal field gates, driveway gates and posts.

2.4 SITE PERSONNEL

It is estimated that 10 to 15 site personnel will be required to complete works for the project.

2.5 TEMPORARY CONSTRUCTION COMPOUND

A temporary compound will be provided to the south of the proposed carpark extension. This will be provided on existing grassland habitat.

2.6 SPOIL STORAGE

All spoil excavated during the construction phase of the project will be reused so that the requirement of the import of material is eliminated or minimised to a low level. Any soil material excavated within the area of works or imported to the site will be stored in the area designated for spoil storage as shown on Figure 2.1.

2.7 DURATION OF CONSTRUCTION PHASE

It is estimated that the construction process will take up to 9 months.

3.0 METHODS

3.1 EXTENDED PHASE 1 HABITAT SURVEY

An extended Phase 1 Habitat Survey was undertaken by DEC Ltd on the 17th November 2019. The methodology used during this survey was based on the Heritage Councils *Best Practice Guidance for Habitat Survey and Mapping* (2010). The classification of habitats recorded during the field survey is based on the Heritage Council's *A Guide to Habitats in Ireland*.

The *Guide to Habitats in Ireland* classifies habitats according to a hierarchical framework with Level 1 habitats representing broad habitat groups, Level 2 representing habitat sub-groups and Level 3 representing individual habitat types. The Phase I Field Survey focused on identifying habitats to Level 3 of the *Guide to Habitats in Ireland*.

The annotation of vegetation occurring within sites was undertaken using the DAFOR scale. This scale refers to plant species in terms of dominance, abundance, frequency, occasional and rare (DAFOR). Plant nomenclature in this report follows Webb (1996) for vascular plants and Smith (2004) for mosses.

A survey for field signs indicating the presence of otters or other protected non-volant mammal species such as Irish stoat and badgers was undertaken during the field surveys. This survey was undertaken during the daytime and particular attention was given to habitat features normally associated with otters. Any mammal field signs typical of otter activity were recorded during the surveys. These field signs, as described in Neal & Cheeseman [(1)] and Bang & Dahlstrom [(2)], include:

- mammal breeding and resting places, such as setts, holts, couches, lairs;
- pathways;
- prints;
- spraints and faecal deposits;
- latrines (and dung pits used as territorial markers);
- prey remains and feeding signs (snuffle holes);
- hair; and
- scratch marks.

All bird species seen using the site (as opposed to simply flying over it) were recorded.

(1) Neal, E., & Cheeseman, C., (1996). 'Badgers'. Poyser Natural History, London.

(2) Bang, P., & Dahlstrom, P., 'Animal Tracks and Signs'. Oxford University Press, Oxford.

An appraisal of habitats occurring within the project site for their potential to support bat species was completed during the field surveys in November 2019.

3.2 ECOLOGICAL EVALUATION

Commentary on the ecological value of habitats is provided in Section 4 of this report.

The nature conservation value of habitats and ecological sites occurring within the proposed site are based upon an established geographic hierarchy of importance as outlined by the National Roads Authorities (NRA, 2009). The outline of this geographic hierarchy is provided below and this has been used to determine ecological value in line with the ecological valuation examples provided by the NRA (see NRA, 2009). The geographic evaluation hierarchy is as follows:

- International Sites (Rating A);
- National Importance (Rating B);
- County Importance (Rating C);
- Local Importance (higher value) (Rating D); and
- Local Importance (lower value) (Rating E)

The evaluation of birds within the project site is based on the methods outlined by Percival (2003).

3.3 IMPACT ASSESSMENT

3.3.1 Impact Magnitude

Impact magnitude refers to changes in the extent and integrity of an ecological receptor. The IEEM (2006) defines integrity of designated conservation areas as "the coherence of the ecological structure and function across the area that enables it to sustain the complex of habitat and/or the levels of populations of the species for which it was classified". For non-designated sites this can be amended to: "the coherence of ecological structure and function, that enables it (the site or populations supported by the site) to be maintained in its present condition'. For

the purposes of this assessment the impact magnitude is influenced by the intensity, duration, frequency and reversibility of a potential impact and is categorised as follows:

High magnitude impact: that which results in harmful effects to the conservation status of a site, habitat or species and is likely to threaten the long-term integrity of the system.

Moderate magnitude impact: that which results in harmful effects to the conservation status of a site, habitat or species, but does not have an adverse impact on the integrity of the system.

Low magnitude impact: that which has a noticeable effect but is either sufficiently small or of short duration to cause no harm to the conservation status of the site, habitat or species.

Imperceptible: that which has no perceptible impact.

Positive: that which has a net positive impact for the conservation status of a site, habitat or species.

3.3.2 Impact Significance

The significance of impacts is determined by evaluating the nature conservation value of the site, habitat or species concerned together with the magnitude of the impacts affecting the system. The more ecologically valuable a receptor and the greater the magnitude of the impact, the higher the significance of that impact is likely to be. Table 3.1 outlines the levels of impact significance to be used during the assessment of impacts. The probability of an impact occurring will also be outlined when defining the significance of impacts.

Table 3.1: Impact Assessment Matrix

Nature Conservation Value	Magnitude of Potential Impact			
	High	Moderate	Low	Imperceptible
International	Severe	Major	Moderate	Minor
National	Severe	Major	Moderate	Minor
County	Major	Moderate	Minor	Minor
Local	Moderate	Minor	Minor	Negligible

Low	Minor	Negligible	Negligible	Negligible

Impacts to bird species recorded breeding within the project site is based on the methods outlined in Percival (2003).

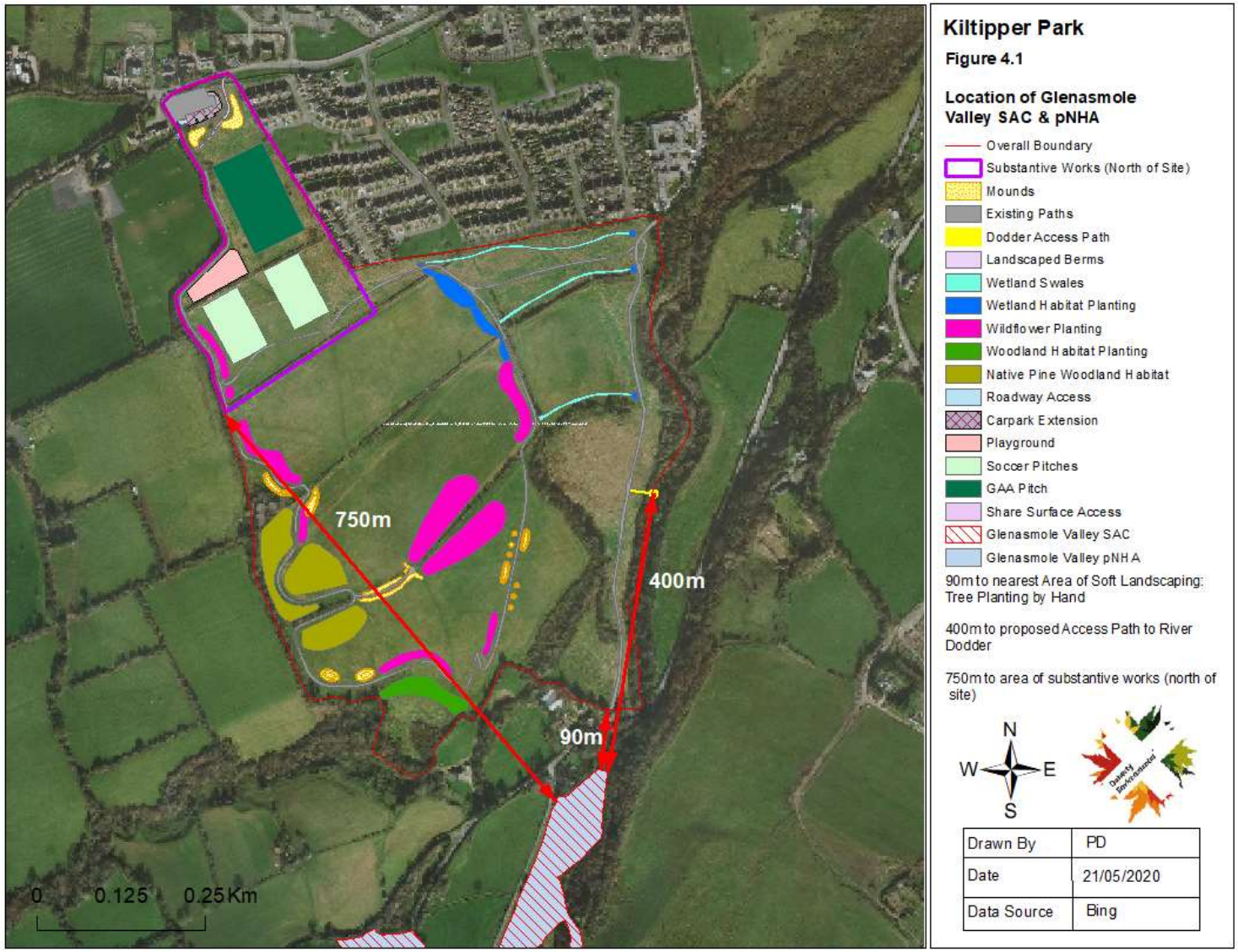
4.0 RESULTS

4.1 DESKTOP ANALYSIS

4.1.1 Designated Conservation Areas

The project site is not located within or immediately adjacent to any designated conservation areas. The Glenasmole Valley SAC and pNHA is the nearest European Site and pNHA to the project. The location of this European Site and pNHA with respect to the project site is shown on Figure 4.1. Both designated areas share a contiguous boundary to the south of the project and are located approximately 90m to the south of the nearest point of project site. The nearest area of works associated with the project to the SAC is the provision of individual tree planting along an existing surface at the entrance to the park, approximately 90m to the north of the project site. The nearest substantive works to the designated conservation sites (i.e. where typical construction works such vegetation clearance and the provision of artificial surfaces will take place) are for the proposed River Dodder access path approximately 400m to the north of the SAC.

No Natural Heritage Areas (NHAs) occur within the wider area surrounding the project.


750m
400m
90m
0
0.125
0.25Km
Kiltipper Park
Figure 4.1
Location of Glenasmole Valley SAC & pNHA
Overall Boundary
Substantive Works (North of Site)
Mounds
Existing Paths
Dodder Access Path
Landscaped Berms
Wetland Swales
Wetland Habitat Planting
Wildflower Planting
Woodland Habitat Planting
Native Pine Woodland Habitat
Roadway Access
Carpark Extension
Playground
Soccer Pitches
GAA Pitch
Share Surface Access
Glenasmole Valley SAC
Glenasmole Valley pNHA
90m to nearest Area of Soft Landscaping: Tree Planting by Hand
400m to proposed Access Path to River Dodder
750m to area of substantive works (north of site)
N
W
E
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Drawn By
PD
Date
21/05/2020
Data Source
Bing

4.1.2 Protected Species Records

A search of the National Biodiversity Data Centre (NBDC) for records of rare and/or threatened species previously identified in the vicinity of the project site was completed in May 2020. Information for the 1km^2 grid O0825, in which the project site is located, and the 1km^2 grid O0824 located to the south of the area of works (in which the River Dodder is located) was downloaded.

No records for rare, threatened and/or protected species are held for the 1km^2 grid square O0825 in which the enhancement works will be completed. Records for the vulnerable species yellow archangel (*Lamiastrum galeobdolon*) are held by the NBDC for the 1km^2 grid square O0824.

South Dublin County Council Parks staff noted the presence of breeding skylark within meadow grassland habitats occurring within the park.

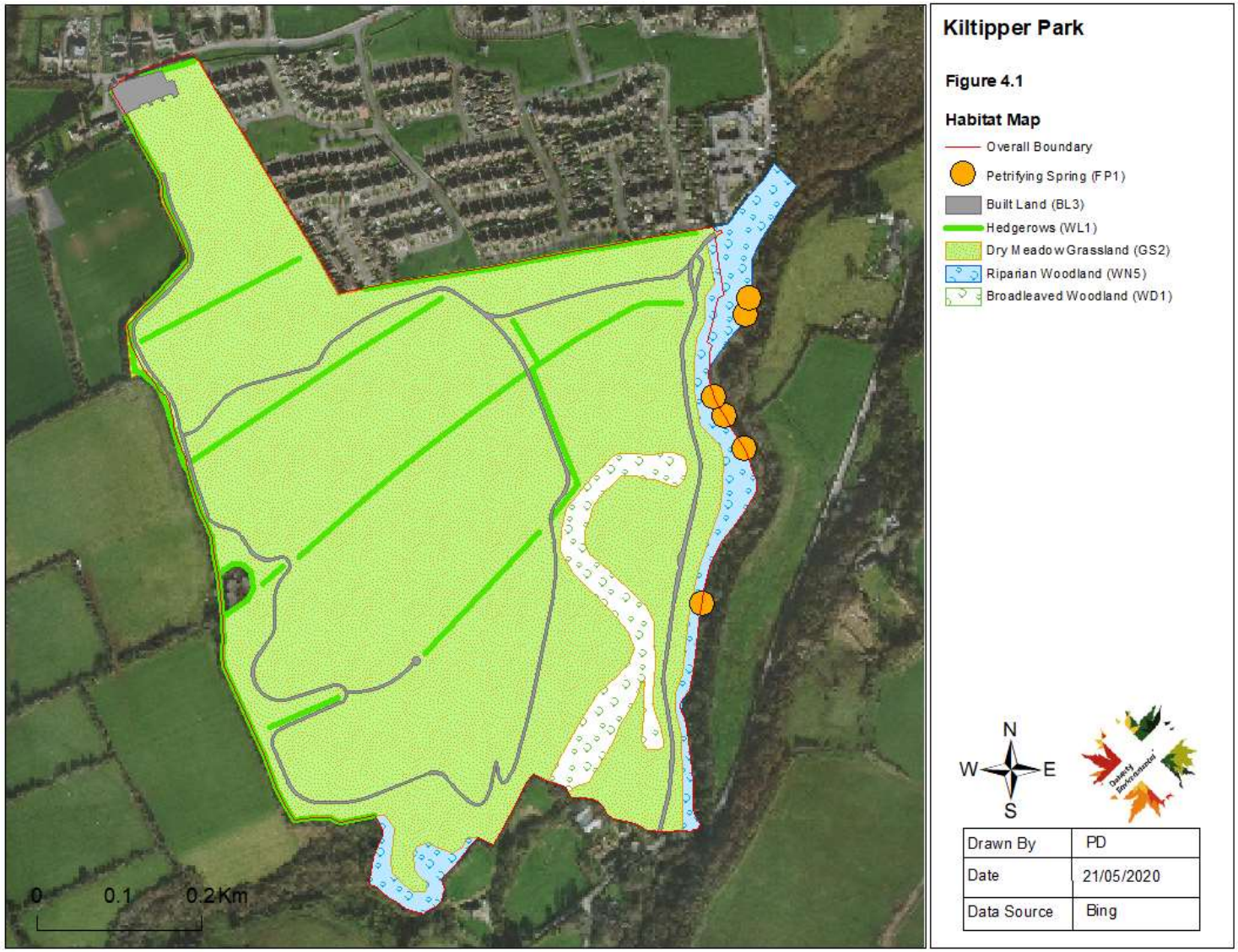
In addition to these other sensitive ecological receptors are known to occur along the River Dodder to the south of the proposed enhancement works area. These include records for otters, red squirrel, badgers and the protected Annex 1 Habitats petrifying spring and alluvial woodland.

4.2 SURVEY RESULTS

4.2.1 Habitats

The following Sub-Sections describe the habitats occurring within and immediately adjacent to the project site. Each habitat described below has been identified to Level 3 of Fossit's *Guide to Habitats in Ireland*. The alpha-numeric code for each habitat is also provided alongside the habitat name (e.g. hedgerow WL1). The locations and extent of each habitat described below are illustrated in Figure 4.2: Habitat Map.

The nature conservation value of each of the habitats occurring within the project site is also outlined in the following sub-sections. The nature conservation value of habitats has been determined with reference to the methods outlined in Section 2.3 above.


Kiltipper Park
Figure 4.1
Habitat Map
Overall Boundary
Petrifying Spring (FP1)
Built Land (BL3)
Hedgerows (WL1)
Dry Meadow Grassland (GS2)
Riparian Woodland (WN5)
Broadleaved Woodland (WD1)
N
W
E
S
0
0.1
0.2Km
Drawn By
PD
Date
21/05/2020
Data Source
Bing

4.2.1.1 Eroding Watercourse (FL1)

The River Dodder along the eastern boundary of the project site is representative of an eroding watercourse (FL1). The water quality of the stretch of the river adjacent to the project site is classed as high by the EPA. The River Dodder is known to support stocks of Atlantic salmon, lamprey species and brown trout. The River Dodder corridor is also known to support otters, kingfishers, dippers and a number of bat species including Leisler's Bat, Soprano pipistrelle, common pipistrelle, Natterer's bat and Daubenton's bat.

4.2.1.1.1 Nature Conservation Value

The stretch of the River Dodder adjacent to the project site is of high status and plays an important role in supporting a range of protected fauna species. It is representative of a semi-natural linear corridor is assessed as being of national nature conservation importance (Rating B).

4.2.1.2 Calcareous Spring (FP1)

Examples of calcareous springs occur along the stretch of the River Dodder to the east of the project site. These springs support a suite of bryophyte vegetation ("brown moss community") that is typical of tufa forming petrifying springs. Vegetation reported as occurring at these springs (ROD, 2017) include: *Pallustriella* spp.; *Bryum pseudotriquetrum*; grasses (*Festuca rubra, Briza media*), sedges (*Carex dioica, C. pulicaris, C. flacca, C. nigra*), Common Butterwort (*Pinguicula vulgaris*) and Marsh Horsetail (*Equisetum palustre*).

4.2.1.2.1 Nature Conservation Value

The calcareous springs occurring along the River Dodder to the east of the project site are representative of the Annex 1 Habitat petrifying springs and are of county nature conservation value (Rating C).

4.2.1.3 Hedgerows

The woodland habitats occurring the project site consist of hedgerows (WL1).

The hedgerows (WL1) occurring within and bounding the project site project site are dominated by *Prunus spinosa, Crataegus monogyna* and *Rubus fruticosus agg.*. Mature *Fraxinus excelsior* tree occur interspersed along the hedgerows. Dominant to abundantly occurring herbs along the hedgerows include *Urtica dioica, Geranium robertianum, Cirsium arvense, Cirsium vulgare, Sonchus asper* and *Galium aparine*.

4.2.1.3.1 Nature Conservation Value

The hedgerows provide an example of woodland habitat within and bounding the area of enhancement works and provide a semi-natural habitat for fauna and also provide refuge and commuting habitat for fauna. These hedgerows are of high local value (Rating D).

4.2.1.4 Riparian Woodland WN5

Riparian woodland occurs along the River Dodder along the eastern boundary of the project site. This habitat is dominated by *Salix* species with *Alnus glutinosa* and *Fraxinus excelsior* also occurring.

4.2.1.4.1 Nature Conservation Value

The example of riparian woodland occurring along the River Dodder adjacent to the project site boundary is of county nature conservation importance (Rating C).

4.2.1.5 Broadleaved Woodland (WD1)

Mature broadleaved woodland occurs within the park. This woodland supports a range of native and non-native species. Species occurring include Pedunculate Oak (*Quercus robur*), Yew (*Taxus baccata*), Scot's Pine (*Pinus sylvestris*), beech (*Fagus sylvatica*), *Fraxinus excelsior* and *Acer pseudoplatanus* . Herbs occurring include *Urtica dioica, Rubus fruticosus agg., Vicia cracca, Geranium robertianum, Circaea lutetiana, Geum urbanum, Ophioglossum vulgatum. Carex sylvatica, Carex remota*, and *Luzula sylvatica*.

4.2.1.5.1 Nature Conservation Value

The broadleaved woodland habitat occurring within the project site is of high local value (Rating D).

4.2.1.6 Dry meadow grassland GS2

The area of enhancement works was formerly used for agricultural purposes and was subject to livestock grazing and improvement. However in more recent times the grassland has been managed as parkland and this has allowed the grassland sward to develop and slightly diversify. Grasses and herbs occurring within the grassland include Alopecurus pratensis, Festuca rubra, Agrostis stolonifera, Lolium perenne, Dactylus glomerata, Holcus lanatus, Ranunculus repens, Bellis perennis, Urtica dioica, Cerastium fontanum, Stellaria media, Veronica chamaedrys and Vicia cracca.

4.2.1.6.1 Nature Conservation Value

The dry meadow grassland habitat dominating the project site has been allowed to diversity and establish meadow grassland characteristics. Given the relative rarity of meadow grassland habitats in the wider surrounding area and their ongoing management as meadows they are considered to be of local heritage value, representative of a habitat of high local importance (local value, Rating D).

4.2.1.7 Built Land BL3

The newly constructed car park to the northern end of the area of proposed enhancement works and the newly constructed surfaced paths along the western boundary of the park are representative of the habitat buildings and artificial surfaces (BL3). This habitat is artificial in nature and devoid of any surface vegetation.

4.2.1.7.1 Nature Conservation Value

The built land occurring within the project site is of low heritage value, representative of a habitat of low importance (lower value, Rating E).

4.2.2 Fauna

An overview of the fauna supported by the site is outlined in the following sections. The nature conservation value of the site in supporting populations of fauna is also outlined in the following sub-section.

4.2.2.1 Non-Volant Mammals

No definitive evidence of protected mammals such as otter or badger was noted within or immediately bounding the project site. A number of mammal entrances for small mammals, most likely to be rabbit warrens were noted along the field boundary associated with the drainage ditch leading east from the project site.

4.2.2.2 Volant Mammals – Bat

The hedgerow habitat occurring within the project site offer some potential foraging and commuting habitat for bats. No trees occurring in these hedgerows offer suitable roosting opportunities for bats. The linear broadleaved woodland habitat within the project site also provides high value foraging habitat for bats and some mature trees have the potential to support low numbers of roosting bats. The River Dodder riparian woodland and river corridor provides high value foraging habitat for bats. Previous surveys (ROD, 2017) have recorded Leisler's Bat, common pipistrelle, Soprano pipistrelle, Daunbenton's bat and Natterer's bat along the River Dodder corridor.

4.2.2.3 Birds

A range of passerines were seen and heard on site during the Phase 1 Habitat Survey. Species recorded include robin, blackbird, chiffchaff, great tit, blue tit, chaffinch, song thrush, dunnock, jackdaw and wood pigeon.

5.0 IMPACT ASSESSMENT

5.1 CONSTRUCTION PHASE

5.1.1 Designated Conservation Areas

There will be no direct impacts to designated conservation areas occurring in the surrounding area. The nearest conservation area to the project site is the Glenasmole Valley SAC and pNHA located approximately 90m to the south of the project site. This SAC and pNHA are buffered from all areas of works associated with the project by existing grassland, hedgerow and built land habitats and as such activities associated with the proposed enhancement works will not have the potential to result in impacts to this SAC or pNHA. Further examination of the project's potential to result in likely significant effects to the Glenasmole Valley SAC and other European Site occurring in the wider area surrounding the project is provided in the Screening Report for Appropriate Assessment.

5.1.2 Habitat Loss

The habitat loss associated with the proposed scheme will be restricted to the loss of dry meadow grassland to the footprint of the playing pitches, playground, shared access surface and car park extension and the loss of a minor area of riparian woodland to the footprint of the proposed River Dodder access path.

This dry meadow habitat has been evaluated as being of high local nature conservation importance (Rating D). The loss of an area of this habitat to the footprint of the project will represent a moderate magnitude impact to this habitat within the overall area of works. A moderate magnitude impact to this habitat of high local conservation value will represent an impact of minor negative significance. Furthermore it is noted that the loss of this area of dry meadow will be offset through the implementation of the proposed landscape design which will provide for the establishment of woodland habitats, wetland and species-rich wildflower meadow habitats within the project site.

There will be a minor loss of riparian woodland habitat to the footprint of the proposed River Dodder access path. A minor loss of this habitat will represent a low magnitude impact. A low

magnitude impact to this habitat of county value will represent an impact of minor negative significance.

There will be no loss of hedgerow, broadleaved woodland or petrifying spring habitat as a result of the proposed enhancement works. All hedgerow occurring within the area of works will be retained and enhanced.

5.1.3 Disturbance to Habitats

Project works, particularly those associated with the proposed River Dodder access path will be completed immediately adjacent to the River Dodder and within the riparian corridor of the river. The discharge of polluting substances such as silt-laden storm water or chemicals, fuels, cements or other contaminating construction phase materials to the river will have the potential to result in disturbance to this habitat. The river has been assessed as being of national conservation value and any pollution of this watercourse could result in an impact of moderate to high magnitude with the potential for major to severe negative effects to this ecological receptor.

It is noted that the final location of the proposed access path to the River Dodder will be selected during the detailed design of the project. At this stage the location of the path will be selected to maximum the buffer distance between it and any example of a petrifying spring habitat. This approach will minimise the potential for this element of the project to result in negative impact to the spring habitats.

The only other elements of the project that will be completed with the watershed of the section of the River Dodder along the eastern boundary of the project site relate to soft landscaping in the form of planting and shallow excavations for wetland swales and wetland habitat. These excavations will be limited to creating depressions in the surface by removing topsoil. Subsoils layers will be left in-situ and there will be no risk of these works polluting underlying groundwater that may contribute base flows to petrifying springs downslope and to the east.

Works to completed to the north of the site (i.e. the car park extension, playing pitches, share surface path etc) are not located within the watershed of the section of the River Dodder occurring to the east of the project site and will not have the potential to result in any indirect impacts to this section of the river.

5.1.4 Disturbance to/Loss of Habitat for Terrestrial Fauna

No breeding sites or resting places of protected terrestrial non-volant mammals such as badgers were noted within or immediately adjacent to the project site. All woodland habitat occurring within the project site that offers potential shelter and foraging habitat for mammal species will be retained, thereby avoiding the loss of habitat for mammals.

The potential will exist for minor disturbance to otters during the construction of the proposed River Dodder access path. However, given the minor scale of works proposed for the path and the absence of any otter holts/couches in the vicinity of the path the impacts to otter is predicted to be minor.

The project site is assessed as being of low value for roosting and foraging bat species and given that the boundary hedgerows surrounding the project site will be retained there will be no physical loss of potential habitat bat commuting or foraging habitat as a result of the project.

5.1.5 Impacts to Birds

The construction phase will have the potential to result in temporary disturbance to bird species using the boundary hedgerows for nesting and foraging. The project will not result in the loss of any important breeding habitat for bird species. All hedgerow and woodland habitats will be retained on site and the provision of additional woodland habitats enhance the nesting opportunities for woodland breeding species. The project has been designed to maintain area of open meadow habitat that are known to support breeding skylark. With the exception of the playing pitches to the north area of open meadow habitat, well buffered from the existing surfaced paths will be maintained on site. These meadow habitats continued to be managed as high sward grassland habitat to promote their suitability for supporting ground nesting bird such as skylarks.

No kingfisher nest sites have been recorded along the section of the River Dodder bounding the project site. The construction activities associated with the proposed River Dodder access path will have the potential to result in some disturbance to foraging kingfishers. However, given the minor and localised scale of these works, the impacts to kingfisher are predicted to be minor.

5.2 OPERATION PHASE

5.2.1 Habitat Loss

The operation phase of the development will not result in any further habitat loss within the project site.

5.2.2 Impacts Terrestrial Fauna

The operation phase of the project is not predicted to have the potential to result disturbance to protected terrestrial mammals or bird species. The design of the project that has maintained woodland habitats and large open areas of grassland meadow devoid of paths and other artificial surfaces. These design features have been implemented to avoid impacts to fauna such as woodland and ground nesting birds that rely on these habitats.

The proposed access path to the River Dodder will be small in scale, thus ensuring a restricted level of access to the river corridor. The use of this path by people is not predicted to have the potential to result in disturbance to sensitive species, such as otters, kingfisher, dipper or bats using this section of the river for foraging.

With the establishment of the proposed landscaping elements that form part of the enhancement works, it is considered likely that the provision of a greater diversity of habitats, including woodland, wetland and species-rich wildflower meadow habitats within the area will result in positive impacts for terrestrial fauna.

6.0 MITIGATION MEASURES

The mitigation measures outlined in the following sections aim to ensure that a best practice approach to minimising ecological disturbance during the construction phase is implemented and that the design of the project's operational phase avoids significant effects the surrounding ecology.

6.1 MEASURES TO MINIMISE IMPACTS TO HABITATS & FAUNA

Habitat disturbance during construction work will be confined strictly to within the direct land-take of the proposed enhancement works.

Construction machinery will be restricted to site roads and the footprint of the proposed scheme.

Where possible vegetation clearance associated with the proposed River Dodder access path will be completed outside the breeding bird season between the months of March and September. In the event of vegetation clearance during the breeding bird season, a breeding bird survey will be required to be completed in advance of clearance works. Only where the vegetation and surrounding area is confirmed to be free of nesting birds will clearance be permitted at this time.

The proposed access path to the River Dodder will be designed so that a continuous woodland canopy is maintained along the riparian corridor overhead along the length of the path running through riparian woodland. This design feature will minimise fragmentation of the woodland and provide continued foraging and commuting habitat for birds, bats and invertebrates.

Replacement and enhancement tree planting will be undertaken as part of the proposed landscaping for the park's enhancement. The landscaping design proposes to plant additional native broadleaved and pine woodland, including fruiting trees and the establishment of this planting will provide additional woodland habitat with the potential to result in a net gain in the extent of semi-natural habitats occurring within the area. The establishment of such woodland habitat will have the potential to result in positive effects for a range of fauna including invertebrates, birds, bats and non-volant mammals.

During the operation phase the area of open meadow will be managed as high-sward grassland. The aim of this management regime will be to encourage people to remain within the surface paths, to continue to provide suitable nesting habitat for ground nesting birds such as skylarks and to allow a natural meadow grassland to development. An infrequent mowing regime will be applied and no mowing will be undertaken during the breeding season so that disturbance to ground nesting birds is avoided. Furthermore, local authority park bye-laws, which will require dogwalkers to restrict dogs to leashes will be implemented during the operation phase of the

park. This will minimise the potential for disturbance to ground nesting birds during the breeding season.

6.2 MANAGEMENT OF SURFACE WATER

In order to minimise the potential for pollution to storm waters generated on site the proposed approach to surface water management during the operation phase, as outlined in Section 2.2 above, will be implemented in full.

The management of surface water during the construction phase will adhere to the recommendations of the CIRIA guides *Control of Water Pollution from Construction Sites* (2001) and *Control of Water Pollution from Linear Construction Projects* (2006).

During construction key requirements for control of chemical pollution risk will include:

- Storage – all equipment, materials and chemicals will be stored away from any watercourse. Chemical, fuel and oil stores will be sited on impervious bases and within a secured bund of 110% of the storage capacity, within the lay down area;
- The integrity and water tightness of all the bunding structures and their resistance to penetration by water or other materials stored therein shall also be tested and demonstrated.
- All fuel oil fill areas will have an appropriate spill apron.
- Vehicles and refuelling – standing machinery will have drip trays placed underneath to prevent oil and fuel leaks causing pollution. Where practicable, refuelling of vehicles and machinery will be carried out on an impermeable surface in designated areas, well away from any surface watercourse;
- Maintenance – maintenance to construction plant will not be permitted on site, unless vehicles have broken down necessitating maintenance at the point of breakdown. All necessary pollution prevention measures will be put in place prior to commencement of maintenance in this instance.

- Concrete - Wet concrete operations will not be carried out within watercourses or adjacent to watercourses. No wet concrete operations will be permitted to be carried out within or immediately adjacent to the River Dodder during the provision of the River Dodder access path.

- Storm water will be directed to drains installed as part of the surface water management plan.

- Mess, sanitation and welfare facilities will be required during construction and will be located at the construction compound. Foul effluent will make use of chemical facilities with periodic removal for offsite disposal.

- During the works for the proposed River Dodder access path silt fences will be erected around the boundary of the path to prevent the discharge of silt-laden surface water to the river. Works in the vicinity of the River Dodder will only be completed during dry conditions and during low ebb flows in the river. Weather forecasts will be monitored in advance of works and the timing of works will be selected to coincide with a period of dry weather conditions. The works associated with the access path to the River Dodder will be monitored daily to ensure no pollution of the river.

6.3 EVALUATION OF MITIGATION MEASURES

The mitigation measures outlined above for the construction and operation phase of the project are taken from established best practice guidelines that have been successfully implemented for a wide range of project-level infrastructural developments. These measures have undergone extensive and rigorous monitoring for their effectiveness at development sites where they have previously been applied to ensure adverse environmental impacts are avoided.

7.0 RESIDUAL IMPACTS

With the proper implementation of the mitigation measures detailed in this report the project will not result in any significant residual negative impacts to ecological receptors occurring within and adjacent to the project site. Furthermore with the establishment of the proposed landscape plan and the development of woodland, wetland and species-rich wildflower

meadows the project will have the potential to result in long-term positive residual impacts for ecological receptors and biodiversity within and surrounding the project site.

As outlined in the baseline and impact assessment sections above no high-value habitat receptors have been identified within the area of the proposed enhancement works and the loss of these habitats will represent at most a negligible residual impact.

The provisions of landscaping and the establishment of woodland and wetland habitats with the park will have the potential to result in positive residual impacts for biodiversity of the area.

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