Blessington eGreenway

Ecological Impact Assessment Report

Wicklow County Council

Project number: PR-447455

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1 EXECUTIVE SUMMARY

Blessington eGreenway (hereafter referred to as the 'Proposed Development') will extend from Blessington in County Wicklow and around a portion of the shoreline of Poulaphouca Reservoir. A Greenway is a cycleway that caters for both pedestrians and cyclists in a recreational environment (TII, 2017).

The scheme is proposed to provide a predominately off-road shared use path for pedestrians and cyclists. The scheme will cover approximately 33km and involve the provision and upgrading of a greenway mostly through forest and woodlands adjacent to a portion of the shoreline of the Blessington Lake/Poulaphouca Reservoir SPA.

Traffic lights are proposed at three existing bridge crossings (Knockiernan Bridge, Baltyboys Bridge and Valleymount Bridge) to manage a new shuttle system for vehicular traffic. This will create space within the existing bridge cross section for the provision of a shared use path to accommodate users of the eGreenway.

The greenway surface construction is proposed to consist of a machine-laid, bound pavement. A 20mm surface course is proposed to be laid on a 40 mm to 55 mm base course on 150mm Clause 804 subbase on a geotextile layer as required. Construction works will require shallow excavation (maximum depth of 200 mm - 300 mm), tree removal and replacement, placement of culverts, single span bridges over larger streams, fencing and minor landscaping.

This report describes the ecological surveys carried out to facilitate the planning, design and construction of the Blessington eGreenway. Appendix A provides maps of the scheme including habitat maps and ecological constraints maps. Maps describe habitats and ecological constraints on a route section basis with the report providing discussion on key attributes highlighted within the route section mapping.

The Proposed Development will generally comprise of 3-4 m wide off-road shared use path which will be used by pedestrians and cyclists. The Greenway will be constructed almost entirely within lands belonging to the Electricity Supply Board (ESB).

The 33km length of the Proposed Development can be split as follows:

- Length of new greenway: 25 km.
- Existing greenway to be upgraded: 4 km (additional parts of the existing greenway are being retained); and
- Urban cycle scheme/traffic calming: 4 km.

The Project site covers an area of circa 16.64 Ha, with an additional area of 3.34 ha for earthworks during construction phase. The urban cycle paths/footpath improvement involve an area of 10,957 m^2 (1.2 km). The extensions to car parking involve an area of 1,690 m^2 while the area of existing car parks is 7,436 m^2.

The purpose of this report is to provide an Ecological Impact Assessment (EcIA) of the Proposed Development. In order to inform this, a range of studies and surveys were undertaken by the authors. These include:

- Desktop study of available resources on the ecological features, constraints and records.
- A walkover survey of the route under study.
- An assessment of the habitat's types.
- Species composition of habitats occurring within the Site.
- A mammal survey of the proposed route and adjacent lands.
- Bat habitat survey.
- A tree survey:
    - Identifying mature and veteran trees.
    - Identifying trees impacted by the Proposed Development.

The results of all of the above surveys have been used to carry out an EcIA of the Proposed Development. Arising from this, a number of impact mitigation measures have been recommended. These will assist in formulating the final design of the Proposed Development.

1.1 Details of Surveys Carried Out

Surveys were carried out in August 2020 and January 2021. Surveys were completed during closest months to optimal timing allowed by the constraints of the project schedule. Timings were optimal for walkover survey, bat surveys, invertebrates and freshwater habitats. Bird surveys were carried out in sub-optimal months as breeding activity such as nesting could not be determined definitively. However, breeding species including summer migrants were still present at this time. Survey timing was suboptimal for mammals as higher vegetation during summer months makes refugia harder to detect. Although activity of some mammals such as Deer are visible throughout the year and other species' refugia were readily detectable, further surveys will be required for these species. The Greylag Goose and the Lesser Black-backed Gull are species of conservation interest for the Poulaphouca reservoir SPA. These species use this SPA as a winter roost site (iWeBS, 2021) and were thus not recorded during survey. Based on the impact risk matrix used to assess the likelihood and significance of impacts to both of these species in the accompanying NIS for the Proposed Development, risks of impacts to these species as a result of the proposed development were not considered significant. As such no species-specific surveys were carried out for either of these species. The literature review carried out for the Proposed Development relating to wintering birds (e.g. Birdwatch Ireland, iWeBS data) did not identify wintering records of Greylag Goose within the footprint surveyed for the Proposed Development. As a result, wintering bird surveys were not deemed necessary for the Proposed Development.

1.2 Habitats Within Area Under Survey

A range of habitats occurs within the area under survey. By far the largest of these, in terms of surface area was the reservoir itself, making up c. 20km^2 of open water.

Woodland is the most commonly occurring habitat after this, fringing much of the reservoir shore. Willow, Ash and Alder-dominated woodland is one of the more common woodland types occurring but there is also a range of other woodland types including plantations – usually of coniferous species – and other modified woodlands. Dry neutral grassland is a very common habitat type within the lands owned by Electricity Supply Board (ESB). Most of this is fallow – with the only grazing here being carried out by Deer. Some of the grassland occurring may be described as calcareous where characteristic plants occur.

Habitats recorded, which contain freshwater components or are dependent on water features, were: wet grassland, tall-herb swamps, springs, streams and small watercourses.

No habitats listed on Annex I of the EU Habitats Directive were found to occur on the Site.

1.3 Notable Flora

No rare, threatened or protected floral species as per the Red Data Book (Curtis and McGough, 1988) or the Ireland Red List for Vascular Plants (Wyse Jackson et al., 2016) were found. No species listed in the Flora Protection Order (2015) were found to be growing within the Site. No such species were recorded within the area of works.

1.4 Trees and Woodlands

An arboricultural survey was carried out as part of this assessment. This has been provided to the client as a separate report. This survey included all trees within the footprint of the proposed route and trees outside this area but whose root systems may be affected by the development. Where there were suspected impacts from the Proposed Development on the trees assessed, the report provides preventative measures that should be taken in an attempt to ensure the protection of any trees of ecological/cultural value. Where trees will have to be removed due to the constraints of the proposed route

or as a result of the findings of this survey, potential preventative measures were also proposed.

The survey assessed 325 individual trees and groups of trees around the Proposed Development route. It is calculated that circa 7265 trees will require to be removed prior to construction of the Blessington eGreenway. A considerable amount of which is in conifer plantations, where trees occur in long stretches and in high densities along the proposed route. Due to the low ecological value of these trees, they were marked to be removed in large numbers. Where possible, existing routes that would negate the removal of trees were identified and detailed in the arboricultural survey report.

This survey also identified over 100 trees that should be retained for both ecological and cultural reasons that will need to be managed and protected during the development. Recommendations for protective measures are outlined and these measures should be subject to regular monitoring by a suitably qualified arborist.

A targeted survey for older, long-established woodlands was also carried out. As well as this, older trees that were notable as either 'veteran 'or 'champion' trees were specifically sought. Ancient and long-established woodlands are among the rarest of habitats in Ireland and are thus of great ecological and landscape significance. Veteran trees are large specimens of mature trees that offer much habitat of themselves. Champion trees are those that are taller, older or larger than others of their particular species.

The Blessington eGreenway will not pass through any woodlands that may be considered to be ancient or long-established. Given the relatively recent creation of the reservoir and the tree-planting and management carried out here, older trees are not common. However, some mature broadleaved trees that are valuable for their habitat as well as aesthetic and landscape value were noted and recorded.

1.5 Notable Fauna

Populations of Badgers hold territories within some portions of the Blessington eGreenway route. There are some setts within close proximity to the Proposed Development, these are the refuges of a protected species. Evidence of Otter activity was also recorded particularly around the Lacken section of the route (See Appendix B.7). While no Otter holts occur within close proximity to the Proposed Development, it is likely that this species would hold several territories within the reservoir. Pine Marten is a protected species that has extended its range in Ireland in recent years. Pine Marten were seen by ecologists during the field surveys along with numerous signs of the species including Scats and feeding remains. Another species, Red Squirrel has similarly expanded its range in recent times and activity signs of this species were also recorded throughout parts of the study area.

Signs of non-protected species such as Fox, Rabbit and Mink, which is an invasive species that can damage wild bird populations were found in several locations.

Surveys for sites suitable for bat roosts were also carried out on buildings and trees found along the near the Proposed Development. No likely roost sites were recorded although much suitable foraging area for several bat species occurs over the area surveyed.

Food plants of the protected butterfly Marsh Fritillary were found in one route section (Blessington) and although no larvae of this species were recorded, it is likely that these will occur later in the season.

All bird species seen and heard during surveys were recorded. The greater majority of the birds recorded were of least conservation concern (Birdwatch Ireland) but 2 no. species were 'red list' species (Black-headed Gull and Meadow Pipit), being of highest conservation concern. The National Parks Wildlife Service (NPWS) Conservation Ranger reported regular sightings of Peregrine Falcon at Ballyknockan and a single sighting of an Osprey (with prey) in September 2020. No Greylag Geese or Lesser Black-backed Gull

which are species of conservation interest for the Poulaphouca reservoir SPA were noted during this survey. This was to be expected as they are a wintering species here.

1.6 Invasive Species

A number of invasive species occur within or close to the route. Invasive alien plant species recorded included Japanese Knotweed, Giant Knotweed, Cherry Laurel and Snowberry. An Invasive Species Management Plan is recommended to be drawn up to plan and complete measures to control or eradicate these species from the route corridor.

1.7 Potential Impacts

As no works will be carried out within the reservoir (a Special Protection Area) no direct impacts of any significance are predicted here. However, disturbance impacts of a short-term duration (during the construction phase) or impacts on water quality were described as *possible*. However, these would be negligible in significance. Some loss of habitat such as hedgerows and treelines will occur but impact significance here will also be negligible.

Losses of some semi-natural habitat areas including woodland types are also likely and will be of *minor adverse* significance. The same evaluation was also given to impacts on grassland habitats such as improved or amenity grassland areas.

No impacts are predicted on wetland habitats such as wet grassland, marsh and swamps as the route will be designed to avoid these areas. Impacts on some species groups are predicted as being of *minor adverse* significance before mitigation is applied. These include Badgers, some refugia of same are located within or close to the Proposed Development.

A number of invasive plant species occur within or adjacent to parts of the Proposed Project. While there is potential for these species to have significant negative impacts, these will not arise if the species are avoided during construction and management measures for their treatment are put in place.

1.8 Proposed Mitigation

An extensive schedule of proposed mitigation measures has been drawn up to address the potential impacts predicted. These include a wide range of measures which include avoidance of areas or conservation interests, the replanting of trees or woodland areas that must be felled or cleared, the linking up of habitat areas with new planting and the salvage of soils from more sensitive sites. Mammal mitigation measures include the avoidance of sensitive areas, the potential exclusion under licence of badger setts that might be directly impacted on by the route and correct timing of works.

Invasive species identified may readily be treated following guidelines given in this report and those of statutory agencies. Mitigation measures outlined within this document will be included within the Construction Environmental Management Plan (CEMP).

2 LEGISLATION AND PLANNING POLICY

2.1 European Council Directives

2.1.1 Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) (The Habitats Directive)

The main aim of the Directive is to promote the maintenance of biodiversity through the conservation of natural habitats and wild species listed on the Annexes of the Directive. Member States are required to take measures to maintain or restore, at favourable conservation status, biodiversity whilst taking account of economic, social, cultural requirements and regional and local characteristics.

It gives effect to site and species protection measures through establishment of the Natura 2000 network and designation of European Sites including Special Areas of Conservation (SAC) and Special Protected Areas (SPA). It also establishes a list of species (other than birds) whose habitats must be protected to secure their survival. These priority species and habitats are subject to a higher level of protection.

The Directive also requires appropriate assessment of any plan or project not directly connected with or necessary to the management of a European Site, but likely to have significant effects upon a European Site, either individually or in combination with other plans or projects.

2.2 Council Directive on the Conservation of Wild Birds (2009/147/EC) (The Birds Directive)

The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It makes provisions for the maintenance of the wild bird populations across their natural range; conserves the habitats for rare or vulnerable species listed in Annex I and of migratory species through the classification of SPAs and provides protection for all wild birds.

2.3 Irish Legislation

2.3.1 The European Communities (Birds and Natural Habitats) (Amendment) Regulations 2015 (S.I. No. 355 of 2015)

The European Communities (Birds and Natural Habitats) (Amendment) Regulations provides that the following shall be construed together as one:

- Wildlife Act 1976;
- Wildlife (Amendment) Acts of 2000, 2010 and 2012;
- European Communities (Birds and Natural Habitats) (Restrictions of the Use of Poison Bait) Regulations 2010;
- European Communities (Birds and Natural Habitats) Regulations 2011;
- European Communities (Birds and Natural Habitats) (Amendment) Regulations of 2013, 2015; and
- Wildlife Amendment Bill 2016 (proposed legislation).

2.3.2 European Communities (Birds and Natural Habitats) Regulations 2011 to 2015

The Regulations give effect to requirements relating to the designation of protected sites under the Birds Directive and Habitats Directive. The Regulations provide for the protection and management of European Sites and place obligations on all public authorities to have regard to the requirements of the Habitats Directive beyond the realms of planning related consents issued under the Planning and Development Act 2000, as amended (the PDA). The Regulations also provide for the protection of species of European importance.

2.3.3 Wildlife Acts 1976 to 2012

The Acts provides for *inter alia* the protection of wildlife. The Acts prohibit the intentional killing, taking or injuring of certain wild birds or wild animals; or the intentional destruction, uprooting or picking of certain wild plants.

2.3.4 Wildlife Amendment Bill 2016

The purpose of the Bill is to provide for the implementation of a reconfiguration of the Raised Bog Natural Heritage Area Network arising from (i) the proposals from the Review of Raised Bog Natural Heritage Area Network published in January 2014; (ii) an assessment of the effects on the environment of the proposals arising from the Review and, if required, any other screening for an assessment or as the case may be, assessment, including public consultation undertaken and (iii) observations or submissions received during the course of public consultation.

Taken as a whole, nature conservation legislation is of key importance in undertaking EcIA for a Proposed Development as it shapes planning policy.

2.4 Planning Policy

2.4.1 Wicklow County Development Plan 2016 – 2022

Wicklow hosts a wealth of wildlife including a range of threatened habitats and species which are protected by law and are recognised as being of local, national and EU importance. Many habitats and species are designated for protection/preservation under national and/or EU legislation. County Wicklow has one National Park, 17 SACs, 35 (proposed) Natural Heritage Areas (NHAs), 4 SPAs, and 6 Nature Reserves.

The County Development Plan (CDP) sets out policies in relation to natural heritage and biodiversity: These consist of 13 Natural Heritage policy objectives that relate to the protection of areas of natural heritage that are protected under European and National guidelines. The plans objective is to ensure that all developments within the county are carried out in accordance with the guidelines for assessment and implementation stated in the Guidelines discussed in section 2 of this report.

The CDP also recognises the need to protect non-designated sites from inappropriate development, ensuring that an EcIA is carried out for any Proposed Development likely to

have a significant impact on locally important natural habitats or wildlife corridors. Ensure appropriate avoidance and mitigation measures are incorporated into development proposals as part of any EcIA.

With regard to recreation and tourism key strategic objectives of the CDP include:

- To facilitate the expansion of existing and the development of new tourism and recreation related developments, in line with the principles for sustainable tourism
- To integrate the County's transport and tourism strategies to promote increasingly sustainable travel patterns among visitors to the County
- To protect Wicklow's principal strengths and capitalise on the distinct tourism and recreational attractions that are on offer – scenic beauty, woodlands and waterways, coastal areas and beaches, and built and natural heritage.

With reference to the Blessington eGreenway the plan states:

To support the development of new and existing walking, cycling and driving routes/trails, including facilities ancillary to trails (such as sign posting and car parks) and the development of linkages between trails in Wicklow and adjoining counties. In particular, to encourage and facilitate the expansion of the 'Blessington eGreenway' walk around the Poulaphouca reservoir.

2.4.2 Wicklow Biodiversity Action Plan 2010-2015

While the timeframe of this plan has expired, the Wicklow Biodiversity Action Plan 2010-2015 outlines an ongoing process for Wicklow County Council which sets out biodiversity priorities for the county, works to achieve them, monitors their success and reassesses the need for action. The plan describes Poulaphouca's importance as both an SPA and as a coarse fishery for species such as Roach and Pike.

3 DESK STUDY

Prior to the main fieldwork contributing to this assessment, a desktop survey of available information sources was carried out. These included:

- The National Biodiversity Data Centre Online Database;
- The National Biodiversity Network Online Atlas;
- The NPWS Protected Species Database and Online Mapping;
- The Environmental Protection Agency Databases;
- The EPA Water Quality in Ireland Report; and
- Biology.ie

Desk research also included a review of records available through the National Biodiversity Data Centre mapping system. These included rare and protected species. Records were requested for all species appearing within the study area or immediately surrounding the study area. The results of which can be seen in Appendix C.

Designated sites were identified using the current boundary shapefiles downloaded from the NWPS website. Records of species from within the relevant Km squares were also obtained. Habitat mapping also reviewed included the Irish Semi-Natural Grassland Surveys (ISGS), the National Survey of Native Woodland (NSNW) and Ancient woodland inventory.

4 FIELD STUDY

Field work for this survey was carried out between the 12th and the 14th of August 2020. The field survey habitat assessments were carried out according to guidelines given by the Heritage Council (2011) and the JNCC (2010). A primary purpose of this survey was to:

- Identify habitat types within the study area;
- Assess for the presence of protected species of flora and fauna;
- Identify ecological and environmental constraints to the construction of this Greenway; and
- Identify ecological sensitivities around and within the study area.

The walkover survey considered a broad survey corridor to ensure all other important features that could be impacted by the development were considered (e.g. significant treelines and hedgerows, mammal paths and other watercourses). Gross habitat mapping was carried out and was a key output of this survey (See Separate Mapping Document in Appendix A). The fieldwork also provided guidance for further, more detailed surveys including further mammal surveys during optimal times of the year (winter) and repeated visits to record invasive species sites. The field survey was also used to identify areas of greater environmental/ecological sensitivity. These were recorded as Ecologically Sensitive Areas (ESAs) and at this stage were flagged for further study and in some cases should be avoided by the development where possible. This survey also established further fieldwork requirements/limitations - e.g. where sites were not accessible.

5 STAKEHOLDER CONSULTATIONS

Prior to and during the fieldwork for the EcIA, the authors undertook measures to consult with a number of bodies and known authorities as well as non-governmental and voluntary organisations.

These included:

Habitats and Species	Birds
National Parks and Wildlife Service Wicklow County Council (Heritage Office) Irish Wildlife Trust National Parks and Wildlife Service	Birdwatch Ireland
Rivers, Fisheries and Watercourses	**Bats**
Inland Fisheries Ireland ESB Fisheries Office	Bat Conservation Ireland National Parks and Wildlife Services
Flora	
Botanical Society of the British Isles	

6 GENERAL ECOLOGY AND HABITATS

6.1 Introduction

The purpose of the survey was to:

- Classify and map the habitats according to Fossitt (2000) and where appropriate the Habitats Directive (European Commission, 2013) classification scheme;
- Carry out an inventory of flora and fauna, particularly mammals and birds, in each section;
- Identify ESAs in the study area; and
- Prepare a GIS database of habitat mapping, rare species records, invasive species and other ecological and management features.

About the Authors

Flynn Furney Environmental Consultants have 20 plus years of experience in ecological surveying and management. We have detailed knowledge on the principles and implementation of both Irish and European environmental legislation. We have worked closely with statutory bodies including the National Parks and Wildlife Service and Waterways Ireland on habitat management and protection projects. Other expertise includes Ecological Impact Assessment, Habitat and Floral Surveys, Bird Surveying, Bat Surveying, Fish and Waterways surveys.

The survey and reporting was carried out by ecologists Billy Flynn, Ian Douglas, Usna Keeting, Éanna Ní Lamhna, Chris Doyle and Seán Meehan. Billy, Seán, Chris and Éanna undertook the botanical and faunal assessment, Usna and Seán undertook bird and mammal surveys. Ian was responsible for the overall GIS habitat mapping. All members of the team are qualified and experienced ecologists.

Billy Flynn (BSc, MSc (Agr.), H.Dip, Dip Ind., MIBiol, MCIEEM, MIEnvSc. CEnv.) is an Ecologist and Chartered Environmental Scientist. He has over 20 years of experience in environmental science and engineering. He is a Director of the Irish Wildlife Trust and a former Director of Voluntary Service International and the Irish Environmental Network. He has extensive experience of large infrastructure projects including motorways, national roads and light rail. He has also worked on several Greenway projects as well as the planning and design of nature trails, constructed wetlands and parkland biodiversity areas.

Ian Douglas (MSc, BSc, H Cert.Ag) is an Ecologist and Agri-environmental Consultant specialising in ecological assessment, soil science, GIS mapping, land capability assessment and regenerative agriculture. Ian has worked between ecological and agricultural consulting, with clients ranging from large developers to individual farmers and land managers. Projects have included ecological impact assessments, appropriate assessment, nutrient management planning and habitat establishment and restoration.

Usna Keating (B.Sc., M.Sc., M.Res.) is an experienced on-site ecologist with an interest in delivering educational programmes. Previous experience includes working as an educator with the Heritage Council where he organised, designed and taught environmental classes (pollination, marine ecology, terrestrial ecology) to primary schools in Munster to raise appreciation of the environment and outdoors. He has worked on many large infrastructure projects in challenging environments. He has worked with universities, state agencies and NGOs and has published a number of scientific research papers, which have primarily focused on bird conservation. He undertook a masters by research in University College Cork, which explored the relationship between afforestation and bird conservation in Ireland, and made recommendations to the Department of Agriculture, Food and The Marine, on Ireland's afforestation policy, to promote biodiversity retention. Usna also worked on an EU Life Project in Biebrzanski

National Park, Poland, and researched and assisted in the development of a management plan to conserve Europe's rarest migratory songbird, the Aquatic Warbler at this site.

Éanna Ní Lamhna has degrees in Botany and Mircobiology and a H. Dip in Education from UCD. She is a long-standing member of the panel of experts on RTÉ's wildlife programme 'Mooney goes Wild', and one of the most instantly recognisable voices on Irish radio. Originally from Louth, she now lives in Dublin, since 1967, and has been president of An Taisce since July 2004. Éanna is also the author of several popular wildlife books. Her books include Talking Wild (2002) and Wild and Wonderful (2004) and Straight Talking Wild (2006).

Seán Meehan is an Ecologist and Associate member of the Chartered Institute of Ecological and Environmental Management (CIEEM) and has worked in environmental consultancy for eight years. He holds a BSc in Agricultural and Environmental Science (UCD) and a MSc in Biological Recording (University of Birmingham, UK). Seán is an independent ecologist providing ecological consultancy on projects including compiling biodiversity chapters for EIARs, Appropriate Assessment screenings, NIS and EcIA report compilation, ecological clerk of works (ECoW) on sites and general habitat and fauna surveys. Seán has also undertaken badger sett exclusion and crayfish translocation (all under NPWS licence).

Chris Doyle has a **BSc** in Applied Plant Biology at University College Cork where he also started hiking, cycling and developing a love for the great outdoors. He has worked as a researcher for the Environmental Protection Agency investigating supply chain sustainability and as an assistant at Teagasc working on various agri-environmental projects.

6.2 Methodology

6.2.1 Desk Study and Consultations

Designated sites were identified using the current boundary shapefiles (SAC 07/2017, SPA 01/2017) downloaded from the NPWS website. Other online mapping reviewed included Geohive maps, aerial photography and EPA shapefile datasets (www.gis.epa.ie/Envision). Habitat mapping reviewed included the ISGS, the NSNW and the Ancient and long-established Woodland (NPWS shapefiles). Desk research also included review of records available through the National Biodiversity Data Centre mapping system. Consultation was made with a number of bodies and individuals which included the NPWS, ESB and Inland Fisheries as well as non-governmental organisations.

6.3 Field surveys

6.3.1 Un-surveyed areas

Due to the density of regrowth encountered, some limited sections of the Proposed Development could not be surveyed. To allow access through many of these areas, land clearance similar to that required for the clearance operations is required. Clearance in un-surveyed areas should take place under the supervision of an Ecologist in case any constraints are identified. These areas have been mapped and can be seen in Appendix A.

6.3.2 Habitats and flora

Habitats within the study area were mapped according to level 3 of the Heritage Council classification (Fossitt, 2000) following the Heritage Council's Best Practice Guidance (Smith et al., 2011) and the Joint Nature Conservation Committee's (JNCC) Handbook for Phase 1 Habitat Survey – a technique for environmental audit (JNCC, 2010). The Heritage Council's *A Guide to Habitats in Ireland* (Fossitt, 2000) is the standard habitat classification system used in Ireland.

Habitats were also assessed for correspondence to the Habitats Directive Annex I habitat types (European Commission, 2013). Habitats of high species diversity or rarity within the local context and sensitive habitats were classified as ESAs.

Habitats and flora field surveys were carried out over 3 days in August 2020. Habitats were mapped by annotating aerial photographs and OSI vector maps in the field and using GPS point. These were then digitized using QGIS 3.4 software. The full extent of the Proposed Greenway corridor was walked. This included an approximately 5-meter-wide strip upon which the Greenway will run. However, the surveyed area was between 10-20 meters and more in open areas. Areas of dense vegetation include scrub and windblown trees were not surveyed as access was not always possible. These areas have been marked as areas to be cleared under the supervision (CUS on the attached mapping) of an ecologist. Areas outside the immediate footprint of the Greenway pathway were also surveyed these may include areas within the same habitat type or adjoining habitats including the reservoir shoreline and surrounding fields, hedgerows and streams.

A list of vascular and other plant species was recorded from each section. Invasive plant species and their location were recorded using a GPS. In particular, the location and extent of Third Schedule Invasive Species was recorded. These are species whose propagation, spreading is strictly controlled by regulations.

The survey was carried out in August 2020, which is late in the flowering season, therefore some early flowering plant species may have been missed. In particular, early flowering orchid species may be under recorded or the abundance of vernal species such as bluebells may be underrepresented.

6.3.3 Ecological Impact Assessment Methodologies

This EcIA has been prepared in accordance with relevant legislation and best practice guidance including:

- The Chartered Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment in the UK and Ireland: terrestrial, freshwater and Coastal 2nd Edition. CIEEM (2018).
- The EPA's Draft Advice Notes on Preparing Environmental Impact Statements (EPA, 2015a).
- The EPA's Draft Revised guidelines on Information to be Contained in Environmental Impact Statements (EPA, 2015b).
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009).

Ecological features (habitats and species) were evaluated for their conservation importance according to the National Roads Authority's scheme (NRA, 2009). For habitats or species, significance of effects was assessed with reference to their conservation status, abundance and distribution. Description of significant effects follows guidance outlined in the EPA Draft Revised Guidelines on the Information to be Contained in EIS (EPA, 2015b). The term 'significant effect' as used in this report follows guidance (CIEEM, 2018) and is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. In the case of designated sites, a negative significant effect would be one that undermines the conservation objectives and targets for that site. The significance of impacts on habitats was determined with reference to the value of the feature being affected and the magnitude of the impact. Impacts are considered ecologically significant at a stated geographic scale or are considered not significant.

7 RESULTS

7.1 Designated Areas

All sites designated for the conservation of nature within 15 km of the proposed works are detailed in Table 1 – Table 2.

Table 1: Designated sites within 15km of the Proposed Development Area

Site Code	Site Name	Designation	Distance from the Site
4063	Poulaphouca Reservoir	SPA	<10 m
731	Poulaphouca Reservoir	pNHA	<10 m
2122	Wicklow Mountains	SAC	440 m
4040	Wicklow Mountains	SPA	440 m
397	Red Bog, Kildare	SAC	2.7 km
393	Liffey Valley Meander Belt	pNHA	2.7 km
1759	Newtown Marshes	pNHA	3.6 km
2053	Hollywood Glen	pNHA	3.8 km
1750	Ballinagee Wood	pNHA	5.4 km
1394	Kilteel Wood	pNHA	6.2 km
211	Slade Of Saggart And Crooksling Glen	pNHA	6.4 km
781	Slaney River Valley	SAC	8.1 km
1209	Glenasmole Valley	pNHA	10.2 km
1209	Glenasmole Valley	SAC	10.3 km
2104	Grand Canal	pNHA	10.6 km
1212	Lugmore Glen	pNHA	10.8 km
1772	Dunlavin Marshes	pNHA	11.1 km
1755	Glencree Valley	pNHA	13.8 km
1396	Liffey Bank Above Athgarvan	pNHA	14.2 km
1395	Liffey At Osberstown	pNHA	14.5 km

A total of 6 sites designated as SAC or SPA were recorded within 15 km of the Proposed Development. Of these only the Poulaphouca Reservoir SPA was considered to have any potential for impacts from the Proposed Development.

A total of 14 pNHAs were also recorded within 15 km of the Proposed Development. Again, only the Poulaphouca Reservoir pNHA was considered to have any potential for impacts from the Proposed Development.

No risks to the conservation objectives of any other sites listed in table 1 are considered likely due one or more of the following:

- Lack of connectivity between the proposed development and the designated area.
- Significant buffer between the proposed works area and the designated area
- No impact or change to the management of the designated area or;
- No change to chemical or physiological condition of the designated site as a result of the proposed development.

Table 2: Poulaphouca Reservoir SPA Conservation Objectives

SITE	CODE	DISTANCE TO DISIGNATED SITE	SCREENING CRITERIA
Poulaphouca Reservoir SPA*	002162	Less than 10m in places/ within SPA in places	Potential pathways for impacts identified
HABITAT TYPES (*DENOTES A PRIORITY HABITAT)			**Habitat (Natura)**
Not designated for any habitats			-
Annex II Species: Common name (*Latin Name*)			**Species (Natura) Code No.**
Greylag Goose (*Anser anser*)			A043
Lesser Black-backed Gull (*Larus fuscus*)			A183

*The Poulaphouca Reservoir's designation as an SPA supersedes the pNHA designation.

7.1.1 Previous Habitat Surveys and Records

A search for previous habitat survey data from surveys carried out within and surrounding the Poulaphouca Reservoir waterbody and shoreline was undertaken. The NPWS website (www.npws.ie) contains details of the Site in the Site Synopsis of the Poulaphouca Reservoir SPA and in the Natura 2000 site data. A previous ecological study carried out here (by the Moore Group) in 2015 was also reviewed. Records of notable flora for the area were also sought from the Botanical Society of the British Isles.

7.2 Overview of Habitats and Classification

An overview of the main habitats recorded within the Proposed Development study area and the classification applied is provided here. More detail is provided in the description of habitats within each section.

7.2.1 Reservoirs (FL7)

According to Fossitt (2000) this category incorporates open water bodies that are used for the storage and supply of water. These water bodies have water levels that fluctuate significantly and unnaturally as a result of abstraction, in addition to also containing modified dams, retaining walls or banks. The diversity of floral species within the waterbody itself was low. No fully aquatic plants like pond lilly or pond weeds were recorded. Reed fringes, vegetated sandy shorelines, and wet woodlands were recorded along the shoreline of the reservoir these are dealt with as separate habitat types and are discussed in detail below.

7.2.2 Exposed Sand, Gravel and Till (ED1)

Fossitt (2000) states that category includes natural or artificial exposures of unconsolidated coarse or mixed sediments. Sand and gravel are mostly made up of sediment particles that are less than 16 mm in diameter. Deposits of sand, gravel or till in this instance have become exposed through the natural forces of erosion and deposition along the reservoir shoreline that has come about as a result of unnatural fluctuations in the water level as a result of abstraction. To be classified as part of this habitat type

vegetation cover should be less than 50%. Areas with cover greater than 50% were usually classified as Wet Grassland, Neutral Grassland, Scrub or (Emerging) Woodland. Species richness within areas of this habitat was significant in places partially were footfall was low or where exposed sands were seasonally waterlogged. Rushes including Jointed Rush (*Juncus articulatus*) and Hard Rush (*Juncus* i*nflexu*s), Sedges included Bottle Sedge (*Carex rostrata*) and Hairy Sedge (*Carex hirta*) were recorded. The herb component was significantly species rich in places and contained all or some of the following: Horsetail (*Equisetum fluviatile*), Common Marsh-bedstraw (*Galium palustre*), Water Mint (*Mentha aquatica*), Silverweed (*Potentilla anserina*), Sneeze Wort (*Achillea ptarmica*), Rosebay Willowherb (*Epilobium angustifolium*), Hawkweed (*Hieracium Spp*), Water Forget-me-not (*Myosotis scorpioides*), Amphibious Bistort (*Polygonum amphibium*), Ragged-robin (*Lychnis flos-cuculi*), Purple loosestrife (*Lythrum salicaria*), Common Scurvygrass (*Cochlearia officinalis*), Marsh Violet (Viola palustris), Lesser Spearwort (*Ranunculus flammula*), Cudweed (*Logfia Spp*), forget-menots (*Myosotis spp*.), Hawkweed (*Hieracium Spp*), Selfheal (*Prunella vulgaris*), Common Bird's-foot Trefoil (*Lotus corniculatus*), Thistles (*Cirsium arvense, C. vulgare*), Docks (Rumex spp.), Brooklime (Veronica beccabunga) and Yarrow (*Achillea millefolium*).

7.2.3 Conifer Plantation (WD4) and Mixed Conifer Woodland (WD3)

Fossitt (2000) describes this category as areas that support dense stands of planted conifers where the broadleaved component is less than 25% and the overriding interest is commercial timber production. The conifer plantations encountered were characterised by even-aged stands of trees that are usually planted in regular rows running adjacent to the reservoir. Plantations consisted mainly of Sitka Spruce (*Picea sitchensis*), Scots Pine (*Pinus sylvestris*) Lodgepole Pine (*Pinus contorta*), Norway Spruce (*Picea abies*) and Larches (*Larix spp.*). Species diversity was generally low and single species stands are common. However, areas where Scots Pine (*Pinus sylvestris*) dominated or where pines had been significantly thinned out were recorded as supporting moderate levels of understory shrubs and ground flora.

Mixed Conifer Woodland as they appeared within the study area was composed of mixed stands of the above species. Depending upon the density of planting and species composition these stands contained varying levels of shrub and understory plants. The scrub layer of this habitat type was generally composed of stands of Willows (*Salix Spp.), Alder (Alnus glutinosa)* (*Alnus glutinosa*), Sessile Oak (*Quercus petraea*), Downy Birch (*Betula pubescens*), Holly (*Ilex aquifolium*), Rowan (*Sorbus aucuparia*), Elder (*Sambucus nigra*), Ash (*Fraxinus excelsior*) and Hazel (*Corylus avellana*) and Beech (*Fagus sylvatica*).

The proportion of ground flora species was dependent upon the degree of light penetration and bramble growth. In many instances, Bramble (*Rubus fruticosus agg.)* dominated the understorey and smothered all other plants with the exception of those who could climb above the thicket like Ivy (*Hedera helix*), Honeysuckle (*Lonicera periclymenum*), Hedge Bindweed (*Calystegia sepium*), Cleavers (*Galium aparine*) and Bush Vetch (*Vicia sepium*). Bent grasses (*Agostis* spp.) were noted here.

7.2.4 Mixed broadleaved/conifer woodland WD2

This general category includes woodland areas with mixed stands of broadleaved trees and conifers, where both types have a minimum cover of 25%, and a maximum of 75%. Trees contained a mixture of both native or non-native species. In general non-natives were usually conifers including Sitka Spruce (*Picea sitchensis*), Lodgepole Pine (*Pinus contorta*), Norway Spruce (*Picea abies*) and Larches (*Larix spp.*) with the exception of the broadleaved species Beech(Fagus sylvatica) (*Fagus sylvatica*) and Sycamore (*Acer pseudoplatanus*). The native broadleaved component usually contained Willows (*Salix Spp.), Alder (Alnus glutinosa)* (*Alnus glutinosa*), Sessile Oak (*Quercus petraea*), Downy Birch (*Betula pubescens*), Holly (*Ilex aquifolium*), Rowan (*Sorbus aucuparia*), Elder (*Sambucus nigra*), Ash (*Fraxinus excelsior*) and Hazel (*Corylus avellana*). The mixture of these species was usually determined by seed sources, light exposure and degree of wetness. Small and immature broadleaved trees and shrubs were common in this habitat types. Understory plants varied greatly across the Site depending on typography and acidity of the soil. Under conifers and where conifers had recently stood the following

herb species were common; Rosebay Willowherb (*Epilobium angustifolium*), Foxgloves (*Digitalis purpurea*) and ferns including Bracken (*Pteridium aquilinum*) and Hard Fern (*Blechnum spicant*). Climbers; Honeysuckle (*Lonicera periclymenum*) and Ivy (Hedera helix) were also common. In areas where broadleaved trees dominated the ground flora layer usually contained Cleavers (Galium aparine) and Bush Vetch (Vicia sepium), Meadow Vetchling (*Lathyrus pratensis*), *Nettle (Urtica dioica)* (*Urtica dioica*), Wood Sorrel (*Oxalis acetosella*).

7.2.5 Scrub (WS1)

This broad category includes areas that are dominated by at least 50% cover of shrubs, stunted trees or brambles. The canopy height is generally less than 5m, or 4m in the case of wetland areas. Scrub develops as a precursor to woodland or as a result of recent disturbance and is often found in inaccessible locations, or on abandoned or marginal land. Scrub was common throughout the study area and has developed in a number of different circumstances. Scrub dominated by bramble was most common. Some of these areas have developed as a result of wind-thrown trees in conifer plantations and in areas where light penetration into the understory was moderate to good. Scrub often formed an impenetrable thicket and often could not be surveyed in detail. Trees in the scrub usually consisted of Willows (*Salix Spp.),* Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Gorse (*Ulex europaeus*). Climbers included Dog-rose (*Rosa canina*) or Bramble (*Rubus fruticosus agg*.), Ivy (*Hedera helix*), Honeysuckle (*Lonicera periclymenum*), Hedge Bindweed (*Calystegia sepium*), Cleavers (*Galium aparine*) and Bush Vetch (*Vicia sepium*). A herb layer and grasses were generally absent or minimal.

7.2.6 Hedgerows (WL1) and Treelines (WL2)

Hedgerows are linear strips of shrubs, often with occasional trees. Some hedgerows may be overgrown or fragmented if management has been neglected, but where still considered in this category unless they have changed beyond recognition. Most hedgerows recorded during this survey were outside the study area or forming the boundary of the study areas e.g. along roadways. Species composition varies with factors

such as age, management, soils and exposure. Hedgerows usually contained plants such as Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Gorse (*Ulex europaeus*), Holly (*Ilex aquifolium*), Dog-rose (*Rosa canina*) or Bramble (*Rubus fruticosus agg*), Ash (*Fraxinus excelsior*), Hazel (*Corylus avella*na), Beech(Fagus sylvatica) (*Fagus sylvatica*), Elder (*Sambucus nigra*), Elms (*Ulmus spp*.) and Willows (*Salix spp*.). In many instance mature trees over 10 meters tall were found within hedgerows. Climbing plants such as Ivy (*Hedera helix*), Honeysuckle (*Lonicera periclymenum*), Hedge Bindweed (*Calystegia sepium*), Cleavers (*Galium aparine*) and Bush Vetch (*Vicia sepium*) were common. Many hedgerows particularly those in front of houses or that ran along roads contained non-native shrub species including Fuchsia (*Fuchsia magellanica*), Butterfly-bush (*Buddleja davidii*), Box (*Buxus sempervirens*), Snowberry (*Symphoricarpos albus*), Cotoneaster (*Cotoneaster spp*.), Leyland cypress (*Cupressus* x *leylandii*) and Cherry Laurel (*Prunus laurocerasus*).

Treelines were also common features in the same context as hedgerows discussed above. Treelines often also had the same characteristics as hedgerows but contained more mature trees. Treelines species included: Beech (*Fagus sylvatica*), Horse Chestnut (*Aesculus hippocastanum*), Sycamore (*Acer pseudoplatanus*), Ash (*Fraxinus excelsior*) and *Alder* (*Alnus glutinosa*).

7.2.7 Mixed Broadleaved woodland (WD1)

Fossit describes this general category of woodlands as areas with 75-100% cover of broadleaved trees, and 0-25% cover of conifers. Mixed Broadleaved woodland is used in situations where woodland stands cannot be classified as semi-natural or are clearly planted this may include woodlands planted hundreds of years before as is often the case in and around old estates. Beech(*Fagus sylvatica*) was a common inclusion in this habitat type along with Willows (*Salix Spp.), Alder (Alnus glutinosa)*, Sessile Oak (*Quercus petraea*), Downy Birch (*Betula pubescens*), Holly (*Ilex aquifolium*) Rowan (*Sorbus aucuparia*), Sycamore (*Acer pseudoplatanus*), Elder (*Sambucus nigra*), Ash (*Fraxinus excelsior*) and Hazel (*Corylus avellana*) in varying quantities. Some truly excellent areas of

mixed woodland were recorded near the grounds of the Russborough House containing veteran Beech (*Fagus sylvatica*), Oak and Hazel. The ground layer within this habitat type was variable and often contained large numbers of sapling Ash (*Fraxinus excelsior*), Elder (*Sambucus nigra*) and Sycamore (*Acer pseudoplatanus*).

Bramble (*Rubus fruticosus agg.)* was dominant or abundant in most areas of Mixed Broadleaved woodland along Wood Speedwell (*Veronica montana*), Ivy (*Hedera helix*), Herb-Robert (*Geranium rob*ertianum), Bush Vetch (Vicia sepium), Enchanter's-nightshade(*Circaea lutetiana*), Wood Sorrel (*Oxalis acetosella*) and Bracken (*Pteridium aquilinum*).

In wet areas where streams and ditches drained into the reservoir or where the ground level was closer to the water level wet woodland areas occurred. Many of these areas have been classified as Wet Willow Woodland (WN6) and these are discussed in section 7.2.8. Areas of broadleaved woodland that were wet but did not fit into that category as they were not permanently waterlogged are described here:

Woodlands dominated by Willows (*Salix Spp.), Alder (Alnus glutinosa)*and Downy Birch (*Betula pubescens*) was commonly found in depressions or forming a thin line along the edge of the lake. *Alder (Alnus glutinosa)* and Willow usually dominated the canopy with grasses including creeping bent (*Agrostis stolonifera*) often forming a uniform mat in the understory. Herbs included Water Mint (*Mentha aquatica*), Water forget-menots (*Myosotis spp*.), Meadowsweet (*Filipendula ulmaria*) and Rushes (*Juncus Spp*). Many of these areas graded into true Wet willow woodland or areas of wet grassland.

7.2.8 Wet willow-Alder-ash woodland (WN6)

According to Fossitt (2000) this broad category includes woodlands of permanently waterlogged sites that are dominated by Willows (*Salix sp.*), Alder *(Alnus glutinosa)* or Ash (*Fraxinus excelsior*), or by various combinations of some or all of these trees. It includes woodlands of lakeshores, stagnant waters and fens. Woodlands of this habitat types have

a ground flora that is often 'grassy' in appearance with abundant remote Sedge (*Carex remota*) and Creeping bents (*Agrostis stolonifera*). Other common components of the field layer include Bramble (*Rubus fruticosus agg*.), Creeping Buttercup (*Ranunculus repens*), Meadowsweet (*Filipendula ulmaria*), Marsh-bedstraw (*Galium palustre*), Yellow pimpernel (*Lysimachia nemorum*) and Lady-fern (*Athyrium filix-femina*).

Within the study area these woodlands were typically found around where rivers and drainage ditches discharged into the reservoir or where the ground level was closer to the water level of the reservoir. These areas were permanently or near permanently flooded for most of the year. Ground flora was quite typical of WN6 woodlands in places with common components including Reed Canary-grass (*Phalaris arundinacea*), Remote Sedge (*Carex remota*), Creeping Buttercup (*Ranunculus repens*), Marsh-bedstraw (*Galium palustre*). Other species commonly occurring in this habitat included Water Mint (*Mentha aquatica*), Marsh Thistle (*Cirsium palustre*), Purple loosestrife (*Lythrum salicaria*), Wild Angelica (*Angelica sylvestris*) and Lady-fern (*Athyrium filix-femina*).

Fossitt notes that "wet willow-Alder-ash woodland (WN6) may contain links with the priority Annex I habitat Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-padion, Alnion incanae, Salicion albae*) (91E0)".

There are a number of variants of alluvial woodlands. European Commission (2007) states that all types of alluvial woodlands occurring on heavy soils that are periodically inundated by the annual rise of river levels, but that are otherwise well drained and aerated during low water. According to O'Neill & Barron (2013), alluvial woodlands in Ireland occur within the hydrological system of a river or lake and are usually periodically inundated. This would correspond to the situation at the Reservoir with water levels not usually dropping much below those experienced during the survey unless during times of significant drought. However, it is believed that the woodland type occurring here is relatively species-poor, in terms of herb species of wetland areas. This is likely due to the

infrequency of inundation of these areas. The poor representation of these plant species would make it unlikely that this habitat type conforms to the Annex I habitat as described above.

7.2.9 Depositing lowland rivers (FW2)

Rivers within the study area were small and generally discharged into the reservoir. In most instances, aquatic vegetation was only occasional and typically species here included Fool's Water Parsley (*Apium nodiflorum*), Reed Canary Grass (*Phalaris arundinacea*) and unbranched Bur-reed (*Sparganium emersum*) with water starwort (*Callitriche sp*.) and Duckweed (Lemna sp.) occurring where the flow was particularly slow.

7.2.10 Reed and large sedge swamps (FS1)

This category includes species-poor stands of herbaceous vegetation that are dominated by reeds and other large grasses or large, tussock-forming sedges. Areas of this habitat type were common around inlets or deep recesses in the reservoir shoreline. Species stands were typically dominated by Reed canary-grass (*Phalaris arundinacea*) with common Club-rush (*Schoenoplectus lacustris*) and Water Horsetail (*Equisetum fluviatile*) rare or occasional. Herb species commonly included Fool's Water-cress (*Apium nodiflorum*), Water Mint (*Mentha aquatica*), and Wild Angelica (*Angelica sylvestris*).

7.2.11 Drainage ditches (FW4)

This category includes linear water bodies or wet channels that are entirely artificial in origin, and some sections of natural watercourses that have been excavated or modified to enhance drainage and control the flow of water. Drainage ditches either contained water (flowing or stagnant) or were wet enough to support wetland vegetation. Drainage ditches were common throughout the site leading into the reservoir. These varied in sizes and significance. Smaller ditches contend little Fool's Water-cress (*Apium nodiflorum*), Bramble (*Rubus fruticosus agg.*), Creeping Buttercup (*Ranunculus repens*) and Lady-fern (*Athyrium filix-femina*).

7.2.12 Dry calcareous and neutral grassland GS1

This category is used for unimproved or semi-improved dry grassland that may be either calcareous or neutral, but not acid. These areas were associated with low intensity agriculture and typically occurred on free-draining mineral soils. Habitats recorded here were more neutral grassland then calcareous in nature. Grazing is a characteristic feature of this habitat types; In this instance grazing pressure was created by Deer. Where grazing was not considered to be greatly impacting the habitat these areas were classified as dry meadows and grassy verges - GS2 (see below). Scatterings of Willow (*Salix Spp*) were found within many areas of GS1 owing to the limited grazing activity. Common grasses included Bents (*Agrostis spp*.), Red Fescue (*Festuca rubra*), False Oat-grass (*Arrhenatherum elatius*), Cock's-foot (*Dactylis glomerata*) and Yorkshire-fog (*Holcus lanatus*). Herb layer contained Bush Vetch (*Vicia sepium*) and Meadow Vetchling (*Lathyrus pratensis*), Common Mouse-ear (*Cerastium fontanum*), Common Knapweed (*Centaurea nigra*), Common Ragwort (*Senecio jacobaea*), Thistles (*Cirsium arvense, C. vulgare*), Docks (*Rumex spp*.) and Ribwort Plantain (*Plantago lanceolata*).

7.2.13 Dry meadow and grassy verges (GS2)

Dry meadow and grassy verges (GS2) primarily occurred on unmanaged land associated with roadside verges, paths and lands unmanaged for recreation or agriculture. These grasslands were typically overgrown, contained a high proportion of course grasses such as Cock's-foot (*Dactylis glomerata*), Bents (*Agrostis spp*.), False Oat-grass (*Arrhenatherum elatius*) and Yorkshire-fog (*Holcus lanatus*). The herb layer contained mainly tall growing or climbing herbs including common Hogweed (*Heracleum sphondylium*), Hedge Bindweed (*Calystegia sepium*), Bush Vetch (*Vicia sepium*) and Common Knapweed (*Centaurea nigra*).

7.2.14 Wet grassland (GS4)

Areas of wet grassland varied across the Site. Significantly large areas of this habitat type were recorded throughout the area where the existing Greenway track passes through. These areas are likely at least seasonally waterlogged as the water level in the reservoir

rises. Owning to the lack of grazing these areas were often dominated by courses grasses including Yorkshire-fog (*Holcus lanatus*) and Creeping Bent (*Agrostis stolonifera*). The herb component usually contained Creeping Buttercup (*Ranunculus repens*), Marsh Thistle (*Cirsium palustre*), Silverweed (*Potentilla anserin*a), Meadowsweet (*Filipendula ulmaria*), Cuckooflower (*Cardamine pratensis*), Water Mint (*Mentha aquatica*) and Horsetails (*Equisetum spp*.), Yellow Iris (*Iris pseudacorus*) were also recorded in some of these areas. Particularly where wet grassland graded into Marsh habitat.

Around the rest of the Reservoir shoreline smaller areas of wet grassland were common. These were usually as a result of the low laying sand banks deposited as a result of fluctuating water levels, around the mouth of rivers or in low laying or submerged areas. As grasses were generally less frequent in these areas the herb component was generally higher. Grass species usually consisted of Creeping Bent (*Agrostis stolonifera*) and Yorkshire-fog (*Holcus lanatus*) along with Rushes (*Juncus spp*.) and Sedges (*Carex spp*.). The herb layers were highly variable and usually contained Water Mint (*Mentha aquatica*), Marsh Thistle (*Cirsium palustre*), Purple loosestrife (*Lythrum salicaria*), Wild Angelica (*Angelica sylvestris*) and Lady-fern (*Athyrium filix-femina*). Common Valerian (*Valeriana officinalis*) and Ragged-robin (*Lychnis flos-cuculi*).

In areas where wet grassland graded into the ED1 exposed shoreline areas of high species diversity were recorded. Herb components included Water Horsetail (*Equisetum fluviatile*), Common Marsh-bedstraw (*Galium palustre*), Water Mint (*Mentha aquatica*), Silverweed (*Potentilla anserina*), Sneeze Wort (*Achillea ptarmica*), Rosebay Willowherb (*Epilobium angustifoliu*m), Hawkweed (*Hieracium Spp*) and Water Forget-me-not (*Myosotis scorpioides*).

7.2.15 Marsh (GM1)

According to Fossitt (2000), marsh is found on level ground near riverbanks, lakeshores, and in other places where mineral or shallow peaty soils are waterlogged, and where the water table is close to ground level for most of the year. Marshes were comparatively

species-rich and supported a high proportion of wetland species in addition to the typical dominants: Rushes (*Juncus spp*.), Sedges (*Carex sp*.) and Meadowsweet (*Filipendula ulmaria*). To be considered as marsh, the proportion of sedges and grasses should not exceed 50%. A number of small marshes were recorded interspersed with willows and wet grassland surrounding the current Greenway track.

Links with Annex I: Marsh may contain pockets of the annexed habitat, 'hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430)'. None were found to conform to this habitat type.

Other habitat types or areas not likely to be impacted as a result of the Proposed Development or of low conservation value but that were also recorded during the survey included those in table 3. These were areas surrounding the route or that were found as a mosaic within the main habitat types discussed above. The occurrences of these habitat types are shown graphically in Appendix A.

Table 3: Other Habitats

Habitat Types	Code	Habitat Types	Code
Stone walls and other stonework	BL1	Amenity Grassland	GA2
Buildings and artificial surfaces	BL3	Dense bracken	HD1
Tilled land	BC3	Rich fen and flush	PF1
Tall-herb swamps	FS2	Ornamental/non-native shrub	WS3
Improved Grassland	GA1	Immature woodland	WS2

8 HABITATS AND ECOLOGY BY ROUTE SECTION

To make this report more user-friendly and manageable route descriptions have been separated into 6 no. main sections based on the townlands in which the route is found. These are shown in Table 4 below.

Table 4: Survey sections (See Appendix A)

Greenway Sections		Report Section
Section 1	Valleymount	8.1 & 8.2
Section 2	Tulfarris	8.3
Section 3	Baltyboys	8.4 & 8.5
Section 4	Blessington	8.6, 8.7, 8.8, & 8.9
Section 5	Ballyknockan	8.10
Section 6	Lacken	8.11

For the purposes of describing the habitats and constraints along the route of the Proposed Development each section was then further subdivided by chainages (refer to the maps contained in Appendix A). A summary of habitats and constraints with each subsection is given in the table at the start of each section. The specific detail of each section is then indicated on the ground by reference to the chainages that indicate 100m increments along the route. This section should be read in conjunction with the associated habitat and ecological constraints maps document which is provided with this document. Photographs taken in each section are also provided in Appendix D.

8.1 Section 1: Valleymount (Part 1)

Table 5: Valleymount Section: Valleymount Carpark to the Annacarney Stream

Map Sections	**Valleymount Carpark to the Annacarney Stream**
Chainages	**0000 - 2600**
Maps	**Valleymount Ecological Constraints 1 – 6** **Valleymount Habitat Maps 1 - 7**

General Habitat types	Exposed Sand, Gravel and Till (ED1) Scrub (WS1) Buildings and artificial surfaces (BL3) Mixed Broadleaved woodland (WD1) Wet willow-alder-ash woodland (WN6) Conifer Plantation (WD4) Mixed broadleaved/conifer woodland (WD2) Scrub(WS1)
Ecological Constraints	Mature Trees Evidence of Red Squirrels Possible Red Squirrel Dreys Rookery Possible Badger Sett Nesting Birds.
Ecological Sensitivities	Areas of diverse wet woodland at stream outfall to be protected. Severe bank erosion.

The route starts at the Valleymount Carpark which is an area of Artificial surface (BL3), surrounded by Exposed Sand, Gravel and Till (ED1) and Scrub (WS1). From **Chainage 0300** the trail will begin through an area of Immature deciduous plantation (WD1) containing mainly Ash, Oak, Rowan, Alder and Birch.

Near **chainage 2000** a possible disused or outlier Badger Sett was recorded along with evidence of badger scratching and also Red Squirrel feeding. This area will need to be resurveyed.

At **chainage 0400** a seasonally wet drain forms the boundary from the immature deciduous plantation (WD1) and an area of Willow dominated mixed woodland (WD1)

with some areas showing characteristics of Wet willow-alder-ash woodland (WN6). The trail should avoid these areas where possible. A thin strip of birch dominated (WD1) woodland beside the R758 should be followed to avoid this area. From **chainage 0550** the route emerges again into immature deciduous plantation (WD1).

From **chainage 0600 to 1000** the route moves closer to the shoreline as it moves through Willow dominated mixed woodland (WD1) with some areas showing characteristics of wet willow-alder-ash woodland (WN6) before emerging into Scrub (WS1) dominated Mixed broadleaved/conifer woodland (WD2) with Scots Pine the dominant species of Pinus. This area should be cleared under supervision (CUS).

Near **chainage 850** an abandoned Badger Sett was recorded along with Badger Scat. A potential Drey was noted in a Scots Pine. Scrub (WS1) and trees in this area should be cleared under supervision.

From approximately **chainage 1000 to 1650** the route is generally dominated by Sitka Spruce, Scots Pine plantation with a dense bramble dominated understory. Immature Rowan, Elder and Ash were common.

From **chainage 1300 to 1350** a nice area of mature deciduous trees including Downy Birch, Holly, Rowan, Elder, Ash and Sycamore was recorded. This should be retained where possible. Sever bank erosion was also recorded along this section and track construction should aim to avoid this area.
Other notable ecological features from this area included:

- At **chainage 1400** Red Squirrel feeding evidence was recorded.
- At **chainage 1580** a possible rookery was recorded
- **At chainage 1625** a mature Crab Apple tree was recorded. This should be retained where possible.
- At **chainage 1050** an old Badger skull was found.

From chainage 1650 to 1750 mature mixed broadleaved woodland (WD1) contain mature Ash was recorded. These should be retained where possible.

From chainage 1750 to 2400 the route moves through generally open Scots Pine plantation with areas of diverse understory recorded around **chainage 2050**. A possible Drey was recorded at **chainage 1800** and mammal tracks were common throughout. Sever bank erosion was again recorded from **chainage 2300 and 2400.**

The **chainage 2400 to 2700** the route loops through an area of mixed woodland (WD1) with some areas showing characteristics of Wet willow-alder-ash woodland (WN6) where the Annacarney Stream discharges into the Reservoir. This area provides excellent habitat for a range of mammal and bird species and the route should aim to cause as little disturbance within this habitat as possible.

From **Chainage 0000 to 2400** the shoreline consisted of Exposed Sand, Gravel and Till (ED1) colonised by plants to varying degrees.

8.2 Section 1: Valleymount (Part 2)

Table 6: Valleymount Section: From Annacarney Stream to Blessington Lake Boat Hire

Map Sections	**Annacarney Stream to Blessington Lake Boat Hire**
Chainages	**2600 - 4866**
Maps	**Valleymount Ecological Constraints 6 - 10** **Valleymount Habitat Maps 7 - 11**
General Habitat types	Exposed Sand, Gravel and Till (ED1) Scrub (WS1) Mixed Broadleaved woodland (WD1) Wet willow-alder-ash woodland (WN6) Conifer Plantation (WD4)

	Mixed broadleaved/conifer woodland (WD2) Scrub(WS1) Dry meadow and grassy verges (GS2) Mixed Conifer Woodland (WD3) Treeline (WL2) Dense Bracken (HD1)
Ecological Constraints	Mature Trees Evidence of Red Squirrels feed Possible Red Squirrel Dreys Badger Setts Possible Pine Marten nest site
Ecological Sensitivities	Areas of diverse wet woodland at stream outfall to be protected. Severe bank erosion. Badger Sett to be avoided

From the **chainage 2700 to 3200** the route moves through generally open conifer plantation dominated by Sitka Spruce and Scots Pine. Has some deciduous understory and Bramble.

At **chainage 2700** a Pine Marten was sighted resting in a tree. This tree may possibly be a nest. This area should be resurveyed as part of winter mammal surveys.
At **chainage 3200** the route crosses the Valleymount Steam. This water course carried very little water at the time of the survey and aquatic plant species were rare.

From **chainage 3200 to 3500** the route moves though Mixed Conifer Woodland (WD3) with dense Scrub (WS1). Some clearance under supervision is required in this area. A small area of Wet willow-alder-ash woodland (WN6) was recorded near **chainage 3300** and should be avoided where possible.

Badger prints were seen at **chainage 3380** with evidence of Red Squirrel and a possible Drey recorded around **chainage 3420.**

From **chainage 3500 to 3650** wind thrown Sitka Spruce made the route impassable. This area should be CUS.

From chainage 3650 to 4100 the route generally moves through Conifer Plantation of either Sitka Spruce or Scots Pine. Areas of Scrub (WS1) will need to be CUS. Red Squirrel Feeding evidence was recorded at **Chainage 3950.**

Between **Chainage 4000 - 4200** Exposed Sand, Gravel and Till (ED1), Scrub (WS1), and Wet willow-alder-ash woodland (WN6). This area occurs where the Ballyknockan Stream discharges into the Reservoir. Specimen Mature Willows were recorded in this area along with a diverse mix of wetland plants including Marsh Thistle, Purple loosestrife, Wild Angelica and Lady-fern. This area should be protected.

From **chainage 4050 to 4300** the route traverses through Conifer Plantation (WD4) and Mixed broadleaved/conifer woodland (WD2) with dense Scrub (WS1). This area should be CUS. A possible Drey was noted at **chainage 4280.**

From **chainage 4300 to 4550** the route moved through a thin strip of Mixed broadleaved/conifer woodland (WD2) containing a number of excellent Mature Oak, Downy Birch, Holly, Rowan, Elder, Ash, Hazel and Beech. This area should be protected where possible

Between **chainage 4400 and 4500** an extensive Badger Sett complex was recorded. The Sett had over 10 entrances that came out on the main track and under the track within the bank. A number of latrines were recorded along with signs of fresh digging.

From **chainage 4550 to 4850** the route follows an existing track through an area of Grassy Verge (GS2) that has been fallow for a number of years. The verges are flanked by a tree line of Alder. A stand of Dense Bracken was recorded near the end of the route.

8.3 Section 2: Tulfarris

Table 7: Tulfarris section: whole route

Map Sections	**Tulfarris whole route**
Chainages	**0000 - 3700**
Maps	**Tulfarris Ecological Constraints 1-7** **Tulfarris Habitat Maps 1 - 7**
General Habitat types	Buildings and artificial surfaces (BL3) Mixed Broadleaved woodland (WD1) Rich fen and flush (Pf1) Amenity Grassland (GA2) Conifer Plantation (WD4) Mixed broadleaved/conifer woodland (WD2) Treeline (WL2) Wet Grassland (GS4) Improved Grassland (GA1)
Ecological Constraints	Mature Trees Evidence of Red Squirrels Evidence of Pine Marten CUS (Clear Under Supervision) Areas
Ecological Sensitivities	Areas of diverse wet woodland at stream outfall to be protected.

The Tulfarris section starts at **chainage 0000** as a spur off the Batlyboys section that leads across the R758 and up onto the L8360. This route will follow an existing roadway (ED3) flanked by Hedgerows (WL1), Treeline (WL2) and Stonewalls (BL1). This route continues

for approximately 830 metres before joining the L8365 road that leads towards the Tulfarris Golf course. Mature trees including Elm and Beech were recorded along this section and should be retained where possible. This section terminates at approximately **chainage 9400.**

From **chainage 9400 to 9600** the route follow L8365 follows west before turning down an unnamed cul de sac that terminates at **chainage 1120.** Along this section the route is flanked by treelines of mainly Beech and Sycamore.

From **chainage 1120 to 1300** the route enters mixed conifer woodland (WD3) along the shoreline of the lake. This woodland was dominated by Sitka Spruce. The understory contained some Elder but this was limited due to lack of light penetration. Dense understory near fallen trees within this section should be CUS. Evidence of Red Squirrel feeding was abundant throughout this section.

At **chainage 1300** a small stream passes through the route fed by a spring that has created an area of wet grassland outside the study area. This small stream looks to have been highly alter and has no fisheries potential. This stream feeds a small area of Flush (PF1) along the shoreline that is outside the zone of influence of the site.
From **chainage 1320 to 1600** conifer plantation (WD4) is the dominant habitat type with Sitka Spruce the dominant species. Another smaller drain crosses the route at **chainage 1550.** Evidence of Red Squirrel feeding was again abundant throughout this section.

From **chainage 1600 to 1720** the route follows through an area of immature Mixed Broadleaved woodland (WD1). This was dominated by Ash and Willow and was characteristically wet throughout.

From **chainage 1720 until 2400** the route follows a linear woodland (WL2) flanked by improved grassland (GA1) and the golf course (GA2).

At **chainage 2400** the route joins a small road that forms part of the network of small roads around the golf course grounds. The route remains within the golf course grounds until **chainage 2690** when it re-joins the L8365

From **chainage 2690 until 3200** the route follows the L8365 north east until where the route originally turned off down the Cul De Sac. This section of the route is flanked by Treelines (WL2) containing excellent mature trees including Beech and Ash.

8.4 Section 3: Baltyboys (Part 1)

Table 8: Baltyboys Bridge to the Blessington Sailing Club section summary

Map Sections	**Baltyboys Bridge to the Blessington Sailing Club**
Chainage	**0000 - 3000**
Maps	**Baltyboys Ecological Constraints 1 – 7** **Baltyboys Habitat Maps 1 - 8**
General Habitat types	Exposed Sand, Gravel and Till (ED1) Exposed Sand, Gravel and Till (Shingles) (ED1) Buildings and artificial surfaces (BL3) Mixed Broadleaved woodland (WD1) Amenity Grassland (GA2) Dry calcareous and neutral grassland (GS1) Dry meadow and grassy verges (GS2) Wet grassland (GS4) Conifer Plantation (WD4) Mixed Conifer Woodland (WD3) Mixed broadleaved/conifer woodland (WD2) Scrub (WS1) Treeline (WL2) Wet Grassland (GS4)

	Improved Grassland (GA1)
Ecological Constraints	Mature Trees Evidence of Pine Marten Evidence of Otters Stream Crossings Badger Sett CUS (Clear Under Supervision) Areas
Ecological Sensitivities	Areas of diverse wet woodland at stream outfall to be protected.

From **Chainage 0000 to 0600** a double treeline of mature Beech with one Sessile Oak, Sycamore, Birch and a Mature Elm trees line the driveway to the existing car park. Immediately adjacent to the car park is some fallow grassland with a few Willow trees close to the shoreline (ED3). There is a mixture of mature trees in the area close to the boundary path should be avoided these include Oak and Beech. Snowberry, an invasive species, was noted here. The route crosses a clearing of fallow grassland with Nettle and Great Willow-herb. Along the boundary here mature Beech trees should be avoided. CUS (Clear Under Supervision) is required. It is recommended that the route goes through open areas as much as possible.

A ruined building with dense Snowberry was noted. Tree cover increases and the habitat here is mixed broadleaved woodland (WD1). Some unidentified mammal paths were found here. This area should be avoided if possible.

At **chainage 4000** a dense area of Bracken was recorded, this should be CUS. Closer to the shoreline there is Willow, Alder and Gorse. **At chainage 0500** a mature Hawthorn and a mature Elder here should be retained where possible. Further Snowberry was noted here. A mixture of habitats makes up the remainder of this section, including some neutral grassland and recolonising bare ground, bramble scrub and mixed broadleaved woodland with Sycamore, Alder and Ash.

From **Chainage 0600 to 1700** the route diverges from the wooded area toward the shoreline. There is an area of dense Bracken and Bramble scrub. Some Ash and Alder are to be retained where possible. At **chainage 0600** mature Hawthorn, Ash, Rowan were recorded which are to be retained where possible. A small area of broadleaved woodland made up of Willow, Ash and Alder should be retained where possible at **chainage 0650**. Pine Marten activity was also recorded within this area. A small watercourse is crossed at **chainage 0700.**

The route crosses an exposed area of sandy recolonising bare ground and shingle. Some neutral-calcareous grassland is found on the adjacent unstable slope which is being colonised by Bracken and Gorse. Areas of dense Bracken being crossed by the route are to be resurveyed during winter. A mixed broadleaved woodland dominated by Willow is crossed by the route, some of this is young and semi-mature. Woodland habitat here is to be retained where possible and any loss of habitat is to be limited. Pine Marten scat was found on a rock at **chainage 0850.**

At **chainage 1250** there is a change in tree species type and Beech and Ash now appear in the canopy. There is a wet area at **chainage 1300** and a spring is found here. Angelica and Soft Rush occur here. A boardwalk or similar elevated route may be required here.
Otter activity was recorded at **chainage 1300** with the remains of a cray fish recorded along with prints.
Canopy opens around **chainage 1600** where there is some fallow grassland with Meadowsweet. On the adjacent slope, there is Bird's-foot Trefoil, Ribwort Plantain and Spear Thistle and a single Figwort close to the strandline. There is also some Sheep's bit Scabious.

At **chainage 1700** the canopy continues as a treeline. A large drainage ditch of no fisheries significance and was almost dry at time of survey. A large mature Sessile Oak is on the southern bank of this ditch.

From **chainage 1700** at southern bank of watercourse the route moves Willow-dominated woodland with some Bramble scrub. Some conifers appear in the canopy with Maritime Pine and there are open areas of Gorse and Bramble scrub. A mature Sessile Oak is to be retained. Some CUS is required here as shown on the maps.

From **chainage 1900** Maritime Pine, Crack Willow, Crab Apple, Sitka Spruce and Alder were recorded. Bramble scrub is developing in open areas. Willow woodland becomes more open and Bramble scrub more abundant. A small wet woodland at was recorded at **chainage 20000** with Soft Rush and Iris. After this there is a line of Alders which are to be retained where possible.

Otter activity was recorded throughout this section with two potential Holting sites recorded. Further mammal surveys are required for this area. Track construction should also aim to keep close to the field margin and avoid the shoreline where possible through this section.

From **chainage 2050** mixed broadleaved woodland of Willow and Sycamore opens up to become Alder-dominated. Scots Pine later appears in the canopy. The ground layer is rather poor, being only some grass species where Bramble is not dominant. Badger droppings found at **chainage 2400** along a very well-defined mammal trail.
An area of Bramble scrub dominates an opening in the canopy. This area is to be resurveyed in winter and to be CUS. Sitka Spruce appears along the boundary and becomes more dominant. Another opening has fallow grassland and scrub. Deer were seen here.

At **chainage 2700** areas of dense bracken were rounded followed by Larch and Spruce (WD4) plantation with an open canopy.

A Badger sett is located at **chainage 2700**. This is a single-entrance outlier located within the above plantation. The habitat changes to mixed woodland (WD1) with Alder dominant but also with Ash, Sitka Spruce and Hawthorn and many deer tracks were found here. This extends as far as the Sailing Club.

8.5 Section 3: Baltyboys (Part 2)

Table 9: Baltyboys: Blessington Sailing Club to the Valleymount Bridge

Map Sections	**Blessington Sailing Club to the Valleymount Bridge**
Chainage	**3000 – 5400**
Maps	**Baltyboys Ecological Constraints 7 - 12** **Baltyboys Habitat Maps 8 - 13**
General Habitat types	Exposed Sand, Gravel and Till (ED1) Exposed Sand, Gravel and Till (Shingles) (ED1) Scrub (WS1) Mixed Broadleaved woodland (WD1) Wet willow-alder-ash woodland (WN6) Amenity Grassland (GA2) Dry calcareous and neutral grassland (GS1) Wet grassland (GS4) Conifer Plantation (WD4) Mixed broadleaved/conifer woodland (WD2) Treeline (WL2) Wet Grassland (GS4)
Ecological Constraints	Mature Trees Evidence of Pine Marten Evidence of Otters Stream Crossings CUS (Clear Under Supervision) Areas

Ecological Sensitivities	Areas of diverse wet woodland and Grassland at stream outfalls to be protected.

From the Blessington Lakes Sailing Club to the Valleymount Bridge

Starting at **chainage 3000** within the grounds of the Sailing Club there are areas of Amenity Grassland (GS2) but some of these conform better to agricultural grassland that is occasionally cut. There is a treeline of Rowan, Hawthorn Sycamore and Birch.

From **chainage 3300 to 3600** there is a Larch plantation with an open canopy. Bramble becomes very dense in places.

From **chainage 3610** the habitat changes to mixed broadleaved woodland (WD1) containing Willow, Hawthorn and occasional Sitka Spruce and Elder. The woodland is fringed by Alders closer to the shoreline. This is a relatively diverse woodland and an area of ecological sensitivity (as there is a good degree of natural regeneration and species-richness). Habitat is to be retained and protected where possible.

Adjacent the shoreline there is some neutral-calcareous grassland with Birdsfoot Trefoil, Water Mint and Hawkweed and a little bit of Marsh Woundwort. Reed Canary Grass is occasional in wetter areas and there is some Spearwort.

From **chainage 3800** there is an area of Alder and Bramble scrub with some Willow and Hawthorn developing. The route crosses a stream which is discharging into the lake and some wet grassland has developed here. Freshwater plants here are Fool's Watercress, Iris, Water Mint and Reed Canary Grass. This area is diverse, important for invertebrates and is to be protected. Numerous butterflies and solitary bees were noted here.

At **chainage 3850** the route crosses a small stream that is not of fisheries significance. Fool's Watercress is the only freshwater macrophyte here.

From c**hainage 3900 to 4100** Scots Pine and Sitka Spruce become dominant. Gorse appears in the understorey close to the edge of the shoreline. This meets a Larch plantation with much bramble and Willow on the shoreline side. The habitat then varies between Willow and Scots Pine/Larch to more homogenous Sitka Spruce and Scots Pine plantation, but a strip of Willow woodland remains in front of this closer to the shoreline.

From **chainage 4100 to 4500** the habitat changes to young broadleaved woodland of Ash, Willow, Alder, Birch, Sycamore and Beech. There is area of wet grassland that is to be avoided. After this, the habitat reverts to the mixed woodland with areas of scrub common. These should be CUS. Following this there is a limited area of Iris-dominated area of wet grassland before reverting to mixed woodland as above. To the south of this there is a limited area of fallow grassland and bramble scrub.

From chainage 4100 to 4500 south of this track there is young Willow and Ash woodland with some Alder and abundant Bramble. A limited area of wet grassland with Meadowsweet and Iris is crossed. The dominant habitat type is mixed broadleaved woodland with Ash and Sycamore becoming more frequent in the canopy. Adjacent a clearing of fallow grassland and Bramble scrub there are some mature Rowan trees that should be retained.

At **chainage 4950** a silty drainage ditch (of no fisheries significance) with Fool's Watercress, Iris and Reed Canary Grass is crossed. A bridge will be required over a dry but very deep drainage ditch at **chainage 5000** and another stream is crossed at **chainage 5110**. A portion of wet grassland occurs at the outfall of this watercourse.

The 'beach' area here is mostly exposed sand and gravel with Crack Willow and Black Knapweed colonising this.

At **chainage 5120** to a Willow treeline is crossed by the route and some of this is probably to be lost. Adjacent is an area of fallow grassland with Creeping Buttercup, Plantains, Vetch and Black Knapweed.

From **chainage 5120 to 5400** the route is Willow-dominated woodland with some Ash and Hawthorn. This is dry and very dense. Some of this will be lost. A further mammal survey will be required and clearance under supervision as per the outcome of the mammal survey. Larger mature Willow trees are to be retained if possible.

Some fallow grassland is adjacent the wall of the car park here and there is amenity grassland at the car park. A large mature Ash directly adjacent the car park is to be retained.

8.6 Section 4: Blessington (Part 1)

Table 10: Blessington Baltyboys Bridge to The Avon summary table

Map Sections	**Blessington Baltyboys Bridge to The Avon**
Chainage	**10200a to 7400a**
Map	**Blessington Ecological Constraints 14 - 20** **Blessington Habitat Maps 17 - 20**
General Habitat types	Buildings and artificial surfaces BL3 Improved Grassland GA1 Amenity Grassland GA2 Hedgerows WL1 Treelines WL2 Mixed Broadleaved Woodland WD1 Wet Grassland GS4 Scrub WS1
Ecological Constraints	Himalayan Knotweed Stand

	Large mature trees to be retained where possible Other none natives that do not require treatment under the guidance.
Ecological Sensitivities	None: areas of good willow woodland and mixed woodland

From **chainage 10200a** beginning at the western side of the Baltyboys Bridge the route follows the Kilbride road west towards Blessington. The lake edge as you cross the bridge is dominated by wet Willow-Alder-Ash woodland along the lake shore dominated by Willow. East of the bridge is a significant area of Wet Grassland (GS4). On the northern edge of the road a Treeline (WL1) of Beech, Horse Chestnut, Sycamore and Hazel was observed. This contained a number of excellent mature trees.

North of **chainage 10100a** Himalayan Knotweed (*Persicaria wallichii*) was recorded growing out from within the treeline on the northern side of the road. This may require treatment and is discussed in more detail in section 12.5.

At **chainage 10180** the route turns west into an area of open scrub which grades into reed fringe and wet willow woodland as you move down the slope towards the water's edge. This area was dominated by coarse grasses including False Oat and Cocks Foot with Bramble abundant throughout. Common Reed was also observed with over the whole slope with denser stands along the lakes edge. An invasive non-native Raspberry was also common throughout this area. This habitat continues until **chainage 9950a** where it begins grading into scrub within wet grassland until **chainage 9870a**.

From **chainage 9870a** until **9800a** the route takes place within an area of mixed broadleaved woodland containing Ash, Beech, Willow, Privet and a number of invasive species including Himalayan Honeysuckle, Buddleia and Raspberry. A number of excellent mature trees were also noted in this area including mature Ash and Willow.

A small open area of Wet grassland was noted between **chainage 9800a** and **9760a**

From **chainage 9760a** to **9690a** the route moves through another area of mixed broadleaved woodland contain mature Beech, mature Willow, mature Elm and areas of Bramble scrub. Most of the mature Beech trees were found along the northern edge of the route with Willow dominated woodlands containing Common Reed recorded along the reservoir's shoreline. A small area of scrub was noted around **chainage 9730**.

From **chainage 9690a** to **9490a** the proposed route moves through an area of open wet scrubland dominated by Bramble, False Oat Grass and Horsetail flanked by immature Willow and Alder. This portion of the route runs along a high bank approximately 8 m above water levels.

From **chainage 9490a to 9320a** the route follows a narrow muddy track surrounded by Bramble and immature Willow and Alder. The non-native invasive species Montbretia was also common within this area.

From **chainage 9320a to 9260a** the route follows an existing roadway to some residential housing on a sealed surface before re-joining the Kilbride road.

From **chainage 9260a to 8300a** the route is within an urban environment and as such the main habitat types include Buildings and artificial surfaces (BL3), Treelines (WL2) and Amenity Grassland (GA2). No ecological constraints are noted through this section however route development should aim to maintain flowerbeds, trees and areas of scrub where possible.

Beginning at **chainage 8300a** running to **chainage 7500a** along the Burgage More Road the route is flanked by semi-mature highly managed hedgerows of Hawthorn. Before turning east towards the Avon Lakeshore Holiday Village. Here the road (BL3) Is bounded by a semi-mature highly managed hedgerows of Hawthorn with improved agricultural

grassland (GA1) on either side. The route then moves through a series of roads, houses and other building (BL3) before joining the Greenway.

Chainage 8150b to 8950b is a spur that continues straight down the Burgage More Road that connects up with the existing Greenway within the ESB lands. This roadway starts as a sealed tarmac road (BL3) before turning into a gravel track from **chainage 8850b**. The spur is flanked by a discontinuous hedgerow on both sides of the road until it reaches the terminal end of the Burgage More Road. A number of excellent mature Beech Trees were recorded particularly towards the end of the road. These should be retained wherever possible.

8.7 Section 4: Blessington (Part 2)

Table 11: Blessington: Avon to Wicklow-Kildare Border Bridge summary table

Map Sections	**Avon to Wicklow-Kildare Border Bridge**
Chainage	**7400 to 5500**
Map	**Blessington Ecological Constraints 11 - 14** **Blessington Habitat Maps 14 - 17**
General Habitat types	Exposed Sand, Gravel and Till ED1 Scrub WS1 Mixed Broadleaved woodland WD1 Wet willow-Alder-ash woodland WN6 Reed and large sedge swamps FS1 Dry meadow and grassy verges GS2 Wet Grassland GS4 Marsh GM1 Mixed broadleaved/conifer woodland WD2
Ecological Constraints	Reed Fringes Marshes Retain Immature woodland where possible

	Mature Trees
Ecological Sensitivities	Areas of Marsh and Reed Fringes to be retained and protected during improvement works.

From **Chainage 7400 to 7000** following the existing Greenway route. The track is bounded to the west by mature Treelines of Sycamore and Hawthorn. A number of excellent mature Sycamore and Larch were recorded along here. The western flank of the Greenway is bounded by a Dry grassy verges (GS2) interspersed with Scrub (WS1) containing Willows and Bramble.

From **Chainage 7000 to 6700** the existing Greenway route runs through an area of immature mixed woodland (WD1) consisting of Sessile Oak, Downy Birch, Holly, Rowan, Elder, Ash and Hazel. This area was likely planted within the last 10 -15 years.

At **Chainage 6950** two small Marshes (GM1) either side of the track were recorded. These should be protected where possible.

Chainage 6700 to 6200 follows the existing Greenway route through a mixture of Immature mixed woodland (WD1) with the same species are previously mentioned. With areas of Willow dominated Scrub (WS1) and grassy verges (GS2). No significant ecological constraints were recorded through here.

From **chainage 6200 to 5500** the track follows the existing Greenway route as it moves over a mixture of crushed rock and areas of boardwalk. This area is significantly wetter than previous sections and Reed Fringe habitat (FS1) is common throughout. Areas of Reed fringe dominated by Common Reed should be retained where possible.

8.8 Section 4: Blessington (Part 3)

Table 12: Blessington: Wicklow Kildare Border Bridge to Russborough House Turnoff (L8363)

Map Sections	**Wicklow Kildare Border Bridge to Russborough House Turnoff (L8363)**
Chainage	**5500 - 2400**
Map	**Blessington Ecological Constraints 5 - 11** **Blessington Habitat Maps 7 - 14**
General Habitat types	Mixed Broadleaved woodland WD1 Wet willow-Alder-ash woodland WN6 Dry meadow and grassy verges GS2 Wet grassland GS4 Marsh GM1 Reed and large Sedge Swamp (FS1) Conifer Plantation (WD4) Mixed Conifer Woodland (WD3) Mixed broadleaved/conifer woodland (WD2) Scrub(WS1) Hedgerow(WL1) Treeline (WL2) Wet Grassland (GS4) Improved Grassland (GA1) Lowland Depositing River (FW2) Reservoirs (FL7)
Ecological Constraints	Reed Fringes Marshes Retain Immature woodland where possible Mature Trees Evidence of Red Squirrels

Ecological Sensitivities	Areas of Marsh and Reed Fringes to be retained and protected during improvement works.

From **chainage 5500 to 4800** the proposed route follows the N81 before turning east onto a small cul-de-sac that joins back onto the existing Greenway. The small cul-de-sac is flanked by a small amount of grassy verge (GS2) and hedgerows (WL1). A grove of excellent Mature Beech was recorded where the cul-de-sac joins the Greenway. These should be retained where possible.

From **chainage 4800 to 3700** the route is dominated by mixed broadleaved woodland (WD1) to the north of the route and Mixed Conifer woodland to its south. An excellent grove of Mature Scots Pine was found at **chainage 4500** along with Mature Beech.

From **chainage 4400** the route opens into an area of extensive dry meadow/grassy verge (GS2) within a mosaic of Willows. Mature Willows should be protected through this section. The southern boundary of the route is flanked by Immature mixed woodland (WD1) consisting of Sessile Oak, Downy Birch, Holly, Rowan, Elder, Ash and Hazel. This area was likely planted within the last 10 -15 years.

At **chainage 3800** a spur is proposed that will traverse an area of Mixed broadleaved/conifer woodland (WD2). This will connect the current route with Baltyboys Greenway route section. This area contained Sitka Spruce, Scots Pine along with Elder, Ash and Sycamore. Mature Maritime Pines were recorded here close to the bridge. These should be retained where possible.

From **chainage 3800 to 2700** the route passes excellent Mature Beech and Sycamores on either side of the R758. The route south of the R758 is dominated by conifer plantation (WD4) consisting generally of Sitka Spruce, Lodgepole Pine, Norway Spruce and Larches in pure of nearly pure stands. Understory was limited through this section. Evidence of

Red Squirrel feeding was recorded between **chainage 3700 and 3600.** Conifer plantation (WD4) continues until **chainage 2700**.

From **Chainage 2700 to 2400** the route passes through mixed broadleaved/conifer woodland (WD2) and Mixed broadleaved woodland (WD1). Areas of Wet Grassland (GS4) were present within these habitat areas. No impact to any of these habitats is considered likely as a result of the Proposed Development given the width of the current track.

8.9 Section 4: Blessington (Part 4)

Table 13: Russborough House Turnoff (L8363) to Bishops Lane Car Park section summary

Map Sections	**Russborough House Turnoff (L8363) to Bishops Lane Car Park**
Chainage	**2400 - 0000**
Maps	**Blessington Ecological Constraints 1 – 5** **Blessington Habitat Maps 1 - 7**
General Habitat types	Exposed Sand, Gravel and Till (ED1) Exposed Sand, Gravel and Till (Shingles) (ED1) Scrub (WS1) Buildings and artificial surfaces (BL3) Mixed Broadleaved woodland (WD1) Wet willow-Alder-ash woodland (WN6) Reed and large sedge swamps (FS1) Rich fen and flush (PF1) Amenity Grassland (GA2) Dry calcareous and neutral grassland (GS1) Dry meadow and grassy verges (GS2) Wet grassland (GS4) Marsh (GM1) Conifer Plantation (WD4)

	Mixed Conifer Woodland (WD3) Mixed broadleaved/conifer woodland (WD2) Scrub (WS1) Treeline (WL2) Wet Grassland (GS4) Improved Grassland (GA1)
Ecological Constraints	Veteran Woodlands Mature Trees Evidence of Red Squirrels Invasive Species Nesting Birds.
Ecological Sensitivities	Areas of Fen to be avoided by works Veteran Woodlands to be protected with minimal disturbance where possible No works causing sever vibrations to take place near the Sand Marten colony during the breeding season March to September.

From Chainage 2400 to 2200 the route will follow an existing roadway (BL3) through a carpark for launching boats and Kayaking. Between **chainage 2100 and 2000** a stand of Giant Knotweed (*Fallopia sachalinensis*) and Japanese Knotweed (*Fallopia japonica*) was recorded. This has developed as a result dumping of soil rubble and other building materials. The Giant Knotweed (*Fallopia sachalinensis*) stand was approximately 40m x 10m. The Japanese Knotweed (*Fallopia japonica*) stand has shown signs of previous treatment but was seen to be re-emerging. Further treatment and possibly removal are required. Species guidance on this stand and all other stands can be seen in section 12.5.

From **chainage 2200 to 1600** the track passes through Mixed Broadleaved woodland(WD1) flanked by Mature conifer woodland (WD4). A line of mature Sycamore Trees was recorded near **chainage 1600.**

From **chainage 1600 to 1200** the trail moves through excellent mature mixed woodland (WD1) containing veteran Oaks, Elm, Hazel and Beech. This area is considered ecologically sensitive and requires further assessment prior to works to ensure track construction does not impact upon the woodland. Red Squirrel feeding evidence was also recorded within this area of woodland.

From **chainage 1200 to 0700** the trial moves through open ground with a areas of Rich Fen (PF1) containing willow Scrub (WS1) south of the current track. The track itself follows a strip of Natural (GS1)/Wet (GS4) grassland before entering an area of Mixed broadleaved woodland (WD1) and Treeline (WL2) containing a line of Mature Beech.

From **Chainage 0700 to 0000** the trail moves through Neutral Grassland (GS1). A large sand banks runs along the length of this section with some sections of the bank used as a Sand Marten (*Riparia riparia)* nesting colony. No works should take place near this area that might have excessive vibration during the bird nesting season. Before the car park a small linear woodland (WL2) containing Scots Pine was recorded along with a Rookery. A small building in the car park was also recorded as having Bat roosting potential.

8.10 Section 5: Ballyknockan

Table 14: Ballyknockan Section: Blessington Lake Boat Hire to the Lacken Primary School Road

Map Sections	**Blessington Lake Boat Hire to the Lacken Primary School Road – Whole Route**
Chainages	**0000 - 4292**
Maps	**Ballyknockan Ecological Constraints 1 - 14** **Ballyknockan Habitat Maps 1 - 15**
General Habitat types	Exposed Sand, Gravel and Till (ED1) Scrub (WS1) Immature Woodland (WS2) Buildings and artificial surfaces (BL3) Dense Bracken (HD1) Mixed Broadleaved woodland (WD1) Wet willow-alder-ash woodland (WN6) Dry calcareous and neutral grassland (GS1) Conifer Plantation (WD4) Mixed Conifer Woodland (WD3) Mixed broadleaved/conifer woodland (WD2) Treeline (WL2) Improved Grassland (GA1)
Ecological Constraints	Clear Under Supervision Areas (CUS) Mature Trees Evidence of Otter, Pine Marten and Badger activity
Ecological Sensitivities	Areas wet woodland and shoreline at river out falls to be avoided.

From chainage 0000 – 0300 Travelling north the route moves through Mixed broadleaved/conifer woodland (WD2) before moving into Immature deciduous Woodland (WS2) containing Oak, Rowan, Alder, Birch and Bramble Scrub (WS1). The potential for a Badger Sett was noted within the Scrub areas (WS1) and CUS is advised.

From chainage 0300 to 0600 Dense Scrub (WS1) under Conifers (WD4) was the dominant habitat type. Mammal tracks were recorded frequently throughout this area. Areas of Scrub (WS1) should be CUS.

At **chainage 0750** the Ballyknockan Stream outfalls into the Reservoir. A good stand of silver birch was recorded along other riverine species. This area is considered sensitive and should be avoided where possible.

From **chainage 0800 to 1600** the route passes through Mixed broadleaved and conifer woodland (WD2) composed of Sitka Spruce, Scots Pine and Larches. The broadleaved component contained Willows, Downy Birch and Gorse. The shoreline consisted of Exposed Sand, Gravel and Till (ED1) colonised by plants to varying degrees. Mammal tracks, Pine Marten Scat, Otter spraints and Badger Scat were all recorded within this section. Dense Scrub here should be CUS.

A spur exists at **chainage 1150** leading south east though Scrub (WS1) of Willow and Bramble following a Hedgerow (WL1) through Improved grassland (GA1) onto the Lake Drive Road. Further signs of the above-mentioned mammals were recorded within this area. Scrub CUS is advised. Further mammal surveys are required for this section.

From **chainage 1600 to 2800** the route mainly traverses dense mature Conifer plantations (WD4) with a dense Scrub (WS1) understory. CUS is required for some of these areas. Pine Marten scat was recorded at one location and mammal trails were common. Near

chainage 2450 a stream discharges into the Reservoir. Some good wet woodland habitat exists here, and this area should be avoided where possible due to ecological sensitivities. From **chainage 2800 until 3600** the trail will continue through Mixed conifer woodland (WD2) composed of Sitka Spruce, Scots Pine, and Larches. The broadleaved component contained Willows, Downy Birch, and Gorse. The shoreline consisted of Exposed Sand, Gravel and Till (ED1) colonised by plants to varying degrees. Mammal tracks, Badger scat and Pine Marten scat were also recorded. Dense Scrub here should be CUS as indicated on the Maps.

Between **chainage 3600 and 3800** the route passes through an excellent mosaic of habitats consisting Exposed Sand, Gravel and Till (ED1), Scrub (WS1), Mixed Broadleaved woodland (WD1), Wet willow-alder-ash woodland (WN6), Mixed Conifer Woodland (WD3) and Mixed broadleaved/conifer woodland (WD2). This area occurs where the Lacken Stream and the Kilbeg Stream discharge into the Reservoir. Specimen mature Willows were recorded in this area along with a diverse mix of wetland plants including Marsh Thistle, Purple loosestrife, Wild Angelica, Lady-fern, Common Valerian and Ragged-robin. This area should be avoided where possible. Ground conditions and hydrological linkages with the landscape should be maintained, as such a boardwalk may be necessary for this section. Further detailed botanical surveys should also be carried out in this area.

From **chainage 3800 to 4400** habitats generally consist of conifers plantation (WD4) with areas of Scrub (WS1) and deciduous trees. Badger scat was also recorded at **chainage 4120,** CUS is advised through some of these areas.

8.11 Section 6: Lacken

Table 15: Lacken Section: Lacken Primary School Road to Knockieran Car Park

Map Sections	**Lacken Primary School Road to Knockieran Car Park – Whole Route**
Chainages	**0000 - 5500**
Maps	**Lacken Ecological Constraints 1 - 13** **Lacken Habitat Maps 1 - 14**
General Habitat types	Exposed Sand, Gravel and Till (ED1) Exposed Sand, Gravel, Till, Shingle (ED1) Scrub (WS1) Immature Woodland (WS2) Buildings and artificial surfaces (BL3) Dense Bracken (HD1) Mixed Broadleaved woodland (WD1) Wet willow- woodland (WN6) Conifer Plantation (WD4) Dry Calcareous or Neutral grassland (GS1) Wet Grassland (GS4) Mixed Conifer Woodland (WD3) Mixed broadleaved/conifer woodland (WD2) Treeline (WL2) Improved Grassland (GA1)
Ecological Constraints	Clear Under Supervision (CUS) Areas Mature Trees Evidence of Otter Possible Dreys
Ecological Sensitivities	Areas wet woodland and shoreline at river out falls to be avoided

The Lacken Section starts at the Lacken Primary School road turn off from the Lake Drive Road. From the junction with Lake shore drive road the route will follow the existing road (BL3). This road is bounded by hedgerows (WL1), Treelines (WL2) and Stonewalls (BL1) on both sides beyond these are bounded by Improved Agricultural Grassland (GA1).

These habitats are composed of a double treeline of Ash, Birch and Beech with an understorey of Hawthorn. There is a mature Sycamore and later Gorse and Elder. It should be noted that there is some Snowberry (an invasive species) on the northern side of this laneway.

There is a very mixed double treeline/hedgerow of semi-mature Oak, Sitka Spruce, Cypress, Birch and Ash with a very varied understorey of Elder, Box, Privet and Hawthorn. It should be noted that there is a limited amount of Montbretia (a garden escape) here.

From the shoreline starting at **chainage 0000** the route moves though Scrub (WS1) and Mixed Broadleaved woodland (WD1) until **chainage 0100.** From **chainage 0100 to 0500** the habitats are composed of rough grassland with some Willow scrub (WS1) and Blackthorn encroaching. There is a mature Elm-dominated Treeline (WL2) to the east of the route. The proposed route becomes scrubbier until it enters a small area of wet grassland with some Iris and Meadowsweet. The route then passes through an area of Willow woodland before crossing a drainage ditch and entering Bramble scrub.

From **chainage 0500 to 0700** the route is composed mostly of grassland habitat types; Dry Meadow and Grassy Verges (GS2) and Improved Grassland (GA1). Areas of Exposed Sand, Gravel and Till (ED1) with Scrub (WS1) were recorded along the shoreline. These should be avoided where possible. Much of the route through this section is bounded by Rock armour (ED1)

From **chainage 0700 to 1000** the route continues through Scrub (WS1) and Mixed Broadleaved woodland (WD1). Areas of Scrub here should be CUS. Dry Meadow/Grassy

verges (GS2)/Improved Grassland (GA1) was recorded along the shoreline on sandy substrate. There is a substantial mature treeline and hedgerow of Ash, Alder, Hawthorn, Blackthorn. However, it later becomes dominated Willow. A mammal path was noted here. Bracken later becomes dense and should also be CUS. An Alder treeline develops here which leads to an area of Scrub (WS1) with Gorse. CUS is also recommended here. North of this is an area of Willow Scrub (WS1). A mature Willow and Rowan were noted here.

From **chainage 1000 to 2000** the route travels across Scrub (WS1) but in areas also runs on or close to the shoreline of Shingles, Exposed Sand, Gravel and Till (ED1). Areas of Scrub (WS1) here should be CUS as shown on the Maps. The habitat becomes a mixture of Recolonising Bare Ground (ED3) and Neutral to Calcareous Grassland (GS1) with occasional Vetch, Birdsfoot Trefoil and Devil's Bit Scabious. Another watercourse is crossed before the recolonising Bare Ground/Calcareous Grassland returns. Birdsfoot Trefoil, Spear Thistle, Docks and Cat's-ear are frequent, Black Knapweed is occasional. In grassier areas there is Annual Meadow Grass, Bent Grasses and some Yorkshire Fog. Bracken starts to encroach from the landward boundary. Devil's Bit Scabious and Self-heal are occasional.

It should be noted that some of the watercourses have been covered by rock armour and so it is not possible to examine the substrate of these. One of these is quite substantial and is adjacent to farm machinery at **chainage 2000**. This may be of fisheries significance. Some Brooklime was noted here. A bridge or culvert is needed here.

From **chainage 2000 to 2100** the route moves through a Treeline (WL2) before emerging into Dry meadow and grassy verges (GS1)/Improved Grassland (GA1) habitat.

A mature Hawthorn was noted at **chainage 2250.** Much of this route runs close to the Shingle (ED1) shoreline.

There is a row of semi-mature Sitka Spruce along the bank, tight to the boundary fencing. As the bank widens, the proportion of grass species increases. The habitat on top of the bank is all Neutral to Calcareous Grassland (GS1) with a small amount of Soft Rush. Toward the northern extent of the rock armour.

An Otter Spraint was recorded around **chainage 2525.**

From chainage 2600 to 2800 the route moves through Mixed broadleaved/conifer woodland (WD2) along the boundary with the neighbouring fields. There is a limited area of Wet Grassland (GS4) around a minor watercourse. The route passes through some Bramble Scrub (WS1) and then into a small Willow-dominated Broadleaved Woodland (WD1) of which some is probably to be lost. It then enters a Scots Pine plantation at around **chainage 2700**. This is essentially a monoculture, but it has a relatively open canopy with frequent Nettle, locally frequent Bramble and Bracken and occasional Gorse. Crossing a small watercourse, the ground flora becomes dominated by Bracken for around 100m until grasses and Nettle appear. The plantation ends at **chainage 2800**. Following this there is a very limited amount of Wet Grassland (GS4) either side of an Alder Treeline (WL2). The wet areas are dominated by Iris in places.

From **chainage 2800 to 3000** the route passes through Treeline (WL2) with Wet Grassland (GS4). The track should aim to avoid these seasonally or permanently wet areas where possible by staying close to the boundary with the neighbouring fields,

From **chainage 3000 to 3600** the habitat type is dominated by Conifer Plantation (WD4). With a Mature Ash noted at near **chainage 3600.** This section begins at a Scots Pine plantation in which there is very little ground flora diversity. It is grass-dominated (including Bent species) with frequent Nettles and locally frequent Bramble although Bracken becomes abundant in places. Bush Vetch and Foxglove occur towards the edge of the plantation. A Badger latrine was found within this plantation at **chainage 3090** but there was no indication of Setts present.

From chainage 3600 to 3800 Grassy verges (GS2) habitat with Scrub (WS1) were recorded along the trail route. Some CUS will be required through this section.

From chainage 3800 to 4050 the route takes a wide arch around an areas of Mixed Broadleaved woodland (WD1), Wet willow-alder-ash woodland (WN6) and
Wet Grassland (GS4) occurring where the Carrig Stream outfalls into the reservoir. This area is ecologically sensitive and should be avoided where possible.

From chainage 4050 to 4800 Conifer Plantation (WD4) habitat is dominated by Scots Pine with few other species with the exception of Elder, Elm and young Ash. Bramble is frequent. Areas of Exposed Sand, Gravel and Till (ED1), Mixed Broadleaved woodland (WD1) along the shoreline were also recorded. a Mature Ash (*Fraxinus excelsior*) noted at near **chainage 4400.**

Evidence of Red Squirrel feeding and a possible Drey were recorded around **chainage 4650**, with further evidence recorded near **chainage 4750.**

From chainage 4800 to 5100 the route was dominated by Conifer Plantation (WD4) and Mixed Conifer Woodland (WD3). Small areas of Wet Grassland (GS4) were also recorded; These should be avoided where possible. Scots Pine plantation is the dominant habitat type here. A large mature Ash at the end of the adjacent treeline is to be retained. The understorey is quite dense with Nettle, Bramble, Hawthorn and Elder. The ground here has been disturbed (some decades ago). The route passes the remains of an old stone building that may have to be removed. There was no potential for bat or bird nesting habitat noted in this.

The canopy changes to include Sitka Spruce and there are large mature Sycamores beside the boundary, and these should be retained. A drainage ditch of no fishery significance is crossed. Lots of evidence of Red Squirrel feeding was noted and a possible Drey (in a Sitka

Spruce) was recorded near **chainage 4550**. It is recommended that the route goes through the 2nd and 3rd row (from boundary) of the spruce trees here. An earth bank with no tree cover occurs and this is a potential route for the Greenway. A Jay (a woodland specialist) was heard in this woodland. Areas of fallen trees will require CUS.

From **chainage 5100 to 5400** Sycamore becomes more frequent in the understorey of a Scots Pine plantation. There are still mature Sycamores close to boundary and within the plantation natural regeneration of Ash and Beech was noted. There was also occasional Hawthorn and Holly. It was noted that the area between the shoreline and the boundary is quite narrow here. However, there is ample space to minimise the amount of tree felling required, chiefly by keeping close to the boundary. Much evidence of human activity was found, including litter and remains of campfires.

A very small area of wet grassland occurs close to a derelict building where there is some Iris and Reed Canary Grass. The canopy remains dominated by Scots Pine although there is some dense Holly in the understorey. Beech has become established and is regenerating here. A small area of woodland and Scrub (WS1) at the end of the plantation (tight to boundary) will require to be CUS.

After leaving the plantation there is an area of fallow grassland toward the end of the route. Here there is some bramble encroaching. Willow trees close to the shoreline should be retained where possible.

The route crosses under the existing road and into final part of section. There is some fallow grassland on the embankment and some Hawkweed, Black Knapweed and Meadowsweet as well as some Great Willow-herb. Mature Hawthorns close to the end of the section are to be retained.

From **chainage 5400 to 5500** the dominant habitat types is Grassy verges (GS2)/Wet Grassland (GS4). A number of large trees including Willow and a line of Hawthorn were recorded.

The Lacken route finishes at the Knockieran Bridge car park. The route crosses the road and enters a crushed rock parking area. This is surrounded by amenity grassland leading down to the shoreline.

8.12 Habitats Evaluation

Within the study area, a diverse range of habitats occur, and the linear and continuous nature of the habitats provide an important ecological corridor and also a buffer zone for other species using the surface water body. There is a SPA and pNHA located within much of the Site and therefore is protected under European legislation. The diversity of habitat types was significant and clearly provides an excellent resource base to a range of species.

The table below summarise a detailed summary of the main habitat types found within the survey area.

Table 16: Ecological significance of habitats within the Site.

Ecological feature	Fossitt code	Evaluation	Rationale
Treelines	**WL2**	**High Local**	**Mature treelines some containing notable Mature specimen trees.**
Hedgerows	**WL1**	**High Local**	**Ecological corridor often containing notable Mature specimen trees.**
Wet woodlands	**WN6**	**High local value and regional importance**	**Important for a number of wetland plants but also birds, reptiles and mammals.**

Ecological feature	Fossitt code	Evaluation	Rationale
Broadleaved woodland	WD1	Moderate local, low regional	Areas of value to local wildlife.
Lowland rivers	FW2	High Local	Ecological corridors. None found of high fisheries significance
Reservoir	FL4	International	Reservoir is within a Natura 2000 site (Special Protection Area)
Marsh (GM1)/reed swamp (FS1)	GM1/FS1	High Local	Diverse marginal marsh and reed swamp habitats.
Drainage ditches	FW4	Low Local	Small areas supporting wetland vegetation some of local importance to wildlife
Wet grassland	GS4	Moderate local in general. Higher where it forms part of a mixed wetland habitat mosaics	Small areas of semi-natural habitat or part of broader wetland areas.
Dry meadow grassland Improved Grassland Amenity Grassland	GS2/GS1 GA1 GA2	Low Local	Small areas of generally species poor dry meadow grassland and grassy verges. Often highly modified.
Stone walls and other stone work	BL1	Low Local	Support common but sometimes diverse vegetation
Conifer woodland (WD3)	WD3	Low Local	Local wildlife value
Exposed Sand, Gravel and Till	ED1	Moderate Local, Moderate Regional	Found to contain diverse flowing plant communities in places

Ecological feature	Fossitt code	Evaluation	Rationale
Scrub	WS1	Moderate Local	Important cover for birds. Low diversity overall
Buildings and artificial surfaces	BL3	Low Local	None or limited vegetation
Mixed Conifer Woodland	WD3	Moderate Local, Moderate Regional	No significance for plants and invertebrates but important for Red Squirrel and Pine Marten
Conifer Plantation	WD4	Moderate Local, Moderate Regional	No significance for plants and invertebrates but important for Red Squirrel and Pine Marten
Mixed broadleaved/conifer woodland	WD2	Moderate Local, Moderate Regional	Low to moderately good for plants and invertebrates. Commonly important for Red Squirrel and Pine Marten
Dense Bracken	HD1	Low Local	Low species diversity and ability to support other species.
Tilled Land	BC3	Low local	Low species diversity and ability to support other species.
Immature Woodland	WS2	Low Local	Low in its current state but its diversity will increase with time
Ornamental/Non-native Shrubs	WS3	Low local	Low species diversity and ability to support other species.

A detailed evaluation of the major and most ecologically significant habitats types found during the survey is given below.

8.12.1 Woodland Habitats

Much of the study area is woodland habitat which is composed of conifer plantation, areas of modified deciduous woodland or immature or transitional woodland like Scrub. Conifer plantations particularly those of Sitka Spruce, Lodgepole Pine, Norway Spruce and Larches were generally much lower in overall biodiversity than other habitats within the study area. A lack of light and changes in soil pH brought about by their dense canopies and acidic needles produces sub-optimal conditions for other plant life in general. In many areas, these woodlands were in thin strips and were flanked by deciduous vegetation which helps to add to their overall biological value. These areas were not, however, totally devoid of ecological value. Signs of Pine Martens and Red Squirrels were commonly found within these areas indicating that they provide at the very least some supplementary food sources for these species.

Woodlands of Scots Pine where commonly recorded throughout the Site. These conifer woodlands unlike the above areas generally allowed ample light into their understory where small trees, shrubs and ground flora was able to flourish. Pine Marten and Red Squirrels evidence was commonly recorded with these areas.

Both areas of conifer woodland also contained reasonable amounts of dead standing and laying wood. This was clearly an important food source for a number of species evidenced by peck and scratch marks on the wood.

Where possible to align with existing management processes cut timber should be left in situ to provide food for detritus feeders and those that feed upon them.

Other woodland habitat types include: Scrub (WS1), Immature Woodland (WS2), Mixed Broadleaved woodland (WD1), Wet willow-alder-ash woodland (WN6). Some areas of excellent Mixed Broadleaved woodland containing Mature Willows, Alder, Sessile Oak, Downy Birch, Holly, Rowan, Elder, Ash and Hazel were recorded throughout the Site. In particular woodlands near and around Russbourough House provided excellent habitats

of this kind. Understory development was generally better within these areas compared to most other woodland habitat types.

Areas of Wet willow-alder-ash woodland (WN6) were commonly found around the Site practically in all low laying areas prone to flooding and at the outfall from rivers and streams into the reservoir. These were in many instances found within a mosaic of habitats including Exposed Sand, Gravel and Till (ED1), Scrub (WS1) and Wet Grassland (GS4). Floristically these areas were generally the most species diverse and are likely to provide habitat to a wide range of invertebrate and bird species. These areas are generally within the boundary of the SPA and should be avoided by works where possible.

Scrub woodland formed an important component of the woodlands within the study area. Scrub woodland here is a transitional habitat type brought on by low levels of grazing, wind blow or recolonisation of recently cleared ground. Scrub can provide an important nesting and feeding ground for birds and invertebrates and should not be cleared during the bird nesting season.

Areas of recently planted immature woodland were common around the Site particularly around the current trail route. In their current condition these areas are of low to moderate ecological value but will become more ecologically important within the coming years.

8.13 Grassland habitat types

Grasslands were generally found in areas that were mixed use; for example, an amenity purpose, along the fringes of woodlands and wetlands or forming thing strips along existing footpaths. Grassland habitat types recorded included Dry meadow and grassy verges (GS2), Wet Grassland (GS4), Improved Grassland (GA1) and Dry calcareous and Neutral Grassland (GS1). Of these grassland types, Wet Grassland areas were found to be the most ecologically diverse with some areas containing around 15 to 20 flower plant

species. Wet Grassland areas also the most vulnerable to disturbance and as such should be avoided where possible. Other grassland types were generally species-poor as limited grazing pressure has led to the dominance of coarse grass species limiting overall species diversity. The exception to this is when these grasslands were found as part of a habitat mosaics like those recorded within the current Greenway route where they were found interspersed with wetland habitats and areas of woodland.

8.14 Wetland habitat types

Given the nature of the Site, wetland habitats types were common, these included Lowland Depositing River (FW2), Reservoirs (FL7), Reed and Large Sedge Swamps (FS1), Rich Fen and Flush (PF1) and Marsh (GM1). Wetland habitats were generally recorded as being of high species diversity and in many instances formed an import semi-aquatic boundary between the reservoir and the terrestrial habitat types. Wetland habitats are also important features for a number of wintering migratory birds for which the Reservoir provides an import refuge. Wetland areas should be avoided where possible.

Another important habitat type within or close to the study area was the shoreline was Exposed Sand, Gravel and Till (ED1). This extensive linear habitat was found to be significantly species-diverse with over 20 no. flowering plants recorded in some areas. It was also an important feeding and resting location for a number of birds and mammals. Evidence of Otter feeding, and possible holt sites were recorded along this habitat. Due to its fragile nature and its interaction with the water, works should aim to avoid this habitat type wherever possible. A boardwalk option may be considered for some of this habitat area where avoidance is not possible.

9 ECOLOGICAL IMPACT ASSESSMENT

9.1 Introduction and Context

The impacts which may be expected from the construction of the Proposed Development are assessed below. These possible impacts have been assessed under the CIEEM (2018) and the National Roads Authority guidelines (NRA, 2006). Criteria for assessment of duration of impacts used EPA (2002). These provide guidance on assessing impact significance upon features of sites proposed for works. Impact significance must be given in context of their respective ecological value of the Site and features under study.

The 'ecological value' of an area or feature therefore is defined with reference to geographical context. That is, whether it is of value locally, regionally, nationally or internationally. This is assessed by ecologists on reviewing survey outcomes. Key criteria are the presence of designated sites, the Site or feature containing protected species or areas of high biodiversity. The criteria for ecological value are given in Table 16 below:

Table 17: Ecological Value Criteria

Ecological Value	Criteria
International	'European Sites' including Special Areas of Conservation (SAC) & Special Protection Areas (SPA). Sites that satisfy the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). Features essential to maintaining the coherence of the Natura 2000 Network. Sites containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. Ramsar Sites World Heritage Sites (Convention for the Protection of World Cultural & Natural Heritage, 1972). Sites hosting significant species populations under the Bonn Convention Sites hosting significant populations under the Berne Convention

Ecological Value	Criteria
National	Areas of Special Scientific Interest (ASSI) or Natural Heritage Area (NHA). National Nature Reserves (NNR). Marine Nature Reserves (MNR). Area of Outstanding Natural Beauty (AONB). Refuge for species protected under the Wildlife (Northern Ireland) Order 1985 (as amended). Undesignated sites fulfilling the criteria for designation as an ASSI; NNR; MNR; and/or refuge for species protected under the Wildlife (Northern Ireland) Order 1985 (as amended). Resident or regularly occurring populations (important at the national level) of the following: Species protected under Wildlife (Northern Ireland) Order 1985 or Wildlife Act 1976, as amended); and/or Species listed on the relevant Red Data list. Sites containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.
Regional	Sites of Local Nature Conservation Importance (SLNCI). Areas subject to a Tree Preservation Order. Resident or regularly occurring populations (assessed to be important at the Regional 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; Species protected under the Wildlife (Northern Ireland) Order 1985 (as amended); and/or Species listed on the relevant Red Data list. Sites containing areas of the habitat types listed in Annex I of the Habitats Directive that do not satisfy the criteria for valuation as of International or National importance. Regionally important populations of species or viable areas of semi-natural habitats or natural heritage features identified in the National or Local Biodiversity Action Plan (BAP), if this have been prepared. Sites containing semi-natural habitat types with high biodiversity in a regional context and a high degree of naturalness, or populations of species that are uncommon within the region. Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Ecological Value	Criteria
Local	Locally important populations of priority species or habitats or features of natural heritage importance identified in the Local 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; Species protected under the Wildlife (Northern Ireland) Order 1985 (as amended); 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 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.

EcIAs must also consider the significance of effects that may be expected arising from a Proposed Development. CIEEM guidelines (2018) define a significant effect as:

"an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features'... or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local".

It also states that:

"an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect is a positive or negative ecological effect that should be given

weight in judging whether to authorise a project: it can influence whether permission is given or refused and, if given, whether the effect is important enough to warrant conditions, restrictions or further requirements such as monitoring".

The criteria for assessment of significance of effects is given in the following table. It should be noted that significant effects may also include beneficial effects.

Table 18: Criteria for Assessing Significance of Effects

Impact Significance		Criteria
Significant Negative Effect	Major Adverse	Loss of, permanent damage to or adverse impact on any part of a site of international or national importance; Loss of a substantial part or key feature of a site of regional importance; Loss of favourable conservation status (FCS) of a legally protected species; Loss of or moderate damage to a population of nationally rare or scarce species.
	Moderate Adverse	Temporary disturbance to a site of international or national importance, but no permanent damage; Loss of or permanent damage to any part of a site of regional importance; Loss of a key feature of local importance; A substantial reduction in the numbers of legally protected species such that there is no loss of FCS but the population is significantly more vulnerable; Reduction in the amount of habitat available for a nationally rare or scarce species, or species that are notable at a regional or county level.
No Significant Effect	Minor Adverse	Temporary disturbance to a site of regional value, but no permanent damage; Loss of, or permanent damage to, a feature with some ecological value in a local context but that has no nature conservation designation; A minor impact on legally protected species but no significant habitat loss or reduction in FCS; A minor impact on populations of nationally rare or scarce species or species that are notable at a regional or county level.

Impact Significance		Criteria
	Negligible	No impacts on sites of international, national or county importance; Temporary disturbance or damage to a small part of a feature of local importance; Loss of or damage to land of negligible nature conservation value; No reduction in the population of legally protected, nationally rare, nationally scarce or notable (regional level) species on the site or its immediate vicinity. Beneficial and adverse impacts balance such that resulting impact has no overall affect upon feature.
	Minor Beneficial	A small but clear and measurable gain in general wildlife interest, e.g. small-scale new habitats of wildlife value created where none existed before or where the new habitats exceeds in area that habitats lost.
Significant Positive Effect	Moderate Beneficial	Larger new scale habitats (e.g. net gains over 1 ha in area) created leading to significant measurable gains in relation to the objectives of biodiversity action plans.
	Major Beneficial	Major gains in new habitats (net gains of at least 10 ha) of high significance for biodiversity being those habitats, or habitats supporting viable species populations, of national or international importance cited in Annexes I and II of the habitats Directive or Annex I of the Birds Directive.

The duration of impact must also be considered when assessing overall ecological impacts. Criteria for assessment of duration of impacts uses (EPA 2002), the following terms are defined when quantifying duration:

- Temporary: up to 1 year
- Short-term: from 1-7 years
- Medium-term: 7-15 years
- Long-term: 15-60 years
- Permanent: over 60 years

The likelihood of impacts should also be defined. Assessment of likelihood of impact followed CIEEM guidelines. These assesses likelihood as follows:

- Almost Certain: probability estimated at greater than 95%
- Probable or Likely: probability estimated between 50% and 95%
- Unlikely: probability estimated between 5% and 50%
- Extremely Unlikely: probability estimated at less than 5%

In the case of the development being considered, most effects may be defined as likely as much of the route is known.

The following section gives the evaluation of habitat areas encountered within the scheme. These are given per section and per habitat type. A rationale for selection is also given.

9.2 Blessington eGreenway Habitat Evaluation

Within the study area, a diverse range of habitats occurs and the continuous nature of some of the habitats around provide an important ecological corridor around the reservoir. The Poulaphouca Reservoir SPA occurs within the study area and is evaluated of international conservation importance. As noted in Table 2, Section 7.1 Poulaphouca Reservoir SPA (Site Code 002162) has two qualifying Interests Greylag Goose (*Anser anser*) [A043] and Lesser Black-backed Gull (*Larus fuscus*) [A183]. As outlined within the site synopsis for Poulaphouca Reservoir SPA, the reservoir is of international importance for its associated Greylag Goose population. The site provides the main roost for Greylag Goose and feeding is noted to mostly occur on improved grassland outside of the SPA. Other waterfowl species listed as occurring in the SPA include Whooper Swan, Wigeon, Teal, Mallard, Goldeneye, Cormorant, Great Crested Grebe, Curlew and Mute Swan. These species are noted to occur in low numbers. The reservoir is also noted to attract roosting gulls during winter, most notably a large population of Lesser Black-backed Gull.

For other habitats outside of the SPA in general the woodland habitats and wetland habitats may be evaluated as high local conservation value due to the occurrence of semi-natural habitats with high biodiversity in the local context and the importance of their function as a wildlife refuge in the otherwise intensively farmed or forested land.

While the woodland and wetlands habitats are all evaluated as of high local conservation, the quality or sensitivity of the habitats varies due to degree of species richness, the presence or absence native and non-native species, extent of habitat area or the presence of notable plant or animal species. The more valuable of these areas in terms of biodiversity are defined as ESAs. These are shown in the Maps provided in Appendix A.

ESAs have been identified in the following locations and are depicted on the accompanying habitat and constraints maps in Appendix A and as a table in Appendix B.

Table 19: Ecologically Sensitive Areas recorded within the Site.

ESA ID	Name	Section	Rationale
1	Bird Nesting Potential	Blessington	Protected bird species
2	Woodland containing Veteran Trees	Blessington	Woodland containing veteran trees
3	Sand Martin Nest Site	Blessington	Protected bird species
4	River outfall area	Ballyknockan	River & wetland habitat
5	River outfall area	Ballyknockan	River & wetland habitat
6	River outfall area	Ballyknockan	River & wetland habitat
7	River outfall area	Ballyknockan	River & wetland habitat
8	River outfall area	Ballyknockan	River & wetland habitat
9	River outfall area	Valleymount	River & wetland habitat
10	River outfall area	Valleymount	River & wetland habitat
11	River outfall area	Lacken	River & wetland habitat

ESA ID	Name	Section	Rationale
12	Badger Sett	Valleymount	Badger refuge
13	Red Squirrel evidence	Valleymount	Red Squirrel & Pine Marten habitat
14	Bank Erosion	Valleymount	Erosion risk
15	Wetland area	Blessington	Sensitive wetland habitat
16	Wetland area	Blessington	Sensitive wetland habitat
17	Bank Erosion	Valleymount	Erosion risk
18	wet area may require a boardwalk	Baltyboys	Sensitive wetland habitat
19	Important Woodland Area	Baltyboys	Diverse Woodland Area
20	Wet Grassland	Baltyboys	Sensitive wetland habitat
21	Wet Grassland	Baltyboys	Sensitive wetland habitat
22	Wet Grassland	Ballyknockan	Sensitive wetland habitat
23	Badger Sett	Baltyboys	Badger refuge
24	Marsh Fritillary Area	Blessington	Protected Butterfly Species Area

Tables 20 to 25 below summarise the conservation evaluation for habitats and conservation interests found within the Blessington eGreenway study area.

9.2.1 Conservation Evaluation: Section 1: Valleymount

Table 20: Conservation evaluation: Section 1. Valleymount

VALLEYMOUNT			
Ecological feature	**Fossitt code**	**Evaluation**	**Rationale**
Poulaphouca Reservoir	FL7	International	Site designated as a SPA.
Exposed Sand, Gravel & Till	ED1	Moderate Local	Not a widespread habitat type.
Treelines	WL2	High local	Mature treelines. Ecological corridor.
Dense Bracken	HD1	Low Local	Low species diversity and ability to support other species.
Buildings and Artificial Surfaces	BL3	Low Local	None or limited vegetation.
Mixed Broadleaved Woodland	WD1	Moderate Local	Areas of value to local wildlife.
Wet Willow-Alder-Ash Woodland	WN6	High Local	Important for a number of wetland plants but also birds, reptiles and mammals.
Dry Meadows & Grassy Verges	GS2	Low Local	Small areas of generally species poor dry meadow grassland and grassy verges.
Conifer Plantation	WD4	Low Local	Local wildlife value. Species-poor.

VALLEYMOUNT			
Ecological feature	**Fossitt code**	**Evaluation**	**Rationale**
Mixed Conifer Woodland	WD3	Moderate Local to Moderate Regional	No significance for plants and invertebrates but important for Red Squirrel and Pine Marten.
Mixed Conifer/Broadleaved Woodland	WD2	Moderate Local, Moderate Regional	No significance for plants and invertebrates but important for Red Squirrel and Pine Marten.
Depositing River	FW2	Moderate Local	Watercourse depositing to reservoir.
Scrub	WS1	Moderate Local	Important cover for birds. Low diversity overall.
Badger Sett	N/A	High Local	Protected species under national and international legislation.

9.2.2 Conservation Evaluation: Section 2: Tulfarris

Table 21: Conservation Evaluation: Section 2: Tulfarris

TULFARRIS			
Ecological feature	**Fossitt code**	**Evaluation**	**Rationale**
Treelines	WL2	High local	Mature treelines. Ecological corridor.
Buildings and Artificial Surfaces	BL3	Low Local	None or limited vegetation.
Mixed Broadleaved Woodland	WD1	Moderate Local	Areas of value to local wildlife.
Conifer Plantation	WD4	Low Local	Local wildlife value. Species-poor.
Mixed Conifer/Broadleaved Woodland	WD2	Moderate Local, Moderate Regional	No significance for plants and invertebrates but important for Red Squirrel and Pine Marten.
Wet Grassland	GS4	Moderate local in general. Higher where it forms part of a mixed wetland habitat mosaics	Small areas of semi-natural habitat or part of broader wetland areas.
Improved agricultural grassland	GA1	Low Local	Generally highly modified and species-poor.
Amenity Grassland	GA2	Low Local	Highly modified and species-poor.
Rich Fen & Flush	PF1	High Local	Species-rich wetland area.

9.2.3 Conservation Evaluation: Section 3: Baltyboys

Table 22: Conservation Evaluation: Section 3: Baltyboys

BALTYBOYS			
Ecological feature	**Fossitt code**	**Evaluation**	**Rationale**
Poulaphouca Reservoir	FL7	International	Site designated as a SPA.
Treelines	WL2	High local	Mature treelines. Ecological corridor.
Exposed Sand, Gravel & Till	ED1	Moderate Local	Generally, a species poor habitat type.
Dense Bracken	HD1	Low Local	Low species diversity and ability to support other species.
Buildings and Artificial Surfaces	BL3	Low Local	None or limited vegetation.
Mixed Broadleaved Woodland	WD1	Moderate Local	Areas of value to local wildlife.
Wet Willow-Alder-Ash Woodland	WN6	High Local	Important for a number of wetland plants but also birds, reptiles and mammals.
Dry Calcareous and Neutral Grassland	GS1	Low Local	Small areas of generally species poor dry meadow grassland and grassy verges.
Conifer Plantation	WD4	Low Local	Local wildlife value. Species poor.

BALTYBOYS			
Ecological feature	**Fossitt code**	**Evaluation**	**Rationale**
Mixed Conifer Woodland	WD3	Moderate Local to Moderate Regional	No significance for plants and invertebrates but important for Red Squirrel and Pine Marten.
Mixed Conifer/Broadleaved Woodland	WD2	Moderate Local, Moderate Regional	No significance for plants and invertebrates but important for Red Squirrel and Pine Marten.
Wet Grassland	GS4	Moderate local in general. Higher where it forms part of a mixed wetland habitat mosaics	Small areas of semi-natural habitat or part of broader wetland areas.
Depositing River	FW2	Moderate Local	Watercourse depositing to reservoir.
Improved agricultural grassland	GA1	Low Local	Generally, highly modified and species poor.
Amenity Grassland	GA2	Low Local	Highly modified and species poor.
Scrub	WS1	Moderate Local	Important cover for birds. Low diversity overall.
Badger Sett	N/A	High Local	Protected species under national and international legislation.

9.2.4 Conservation Evaluation: Section 4: Blessington

Table 23: Conservation Evaluation: Section 4: Blessington

BLESSINGTON			
Ecological feature	**Fossitt code**	**Evaluation**	**Rationale**
Poulaphouca Reservoir	FL7	International	Site designated as a SPA.
Treelines	WL2	High local	Mature treelines. Ecological corridor
Hedgerows	WL1	High local	Mature hedgerows. Ecological corridor.
Buildings and Artificial Surfaces	BL3	Low Local	None or limited vegetation.
Improved agricultural grassland	GA1	Low Local	Generally, highly modified and species poor.
Amenity Grassland	GA2	Low Local	Highly modified and species poor.
Exposed Sand, Gravel & Till	ED1	Moderate Local	Generally, a species poor habitat type.
Dense Bracken	HD1	Low Local	Low species diversity and ability to support other species.
Mixed Broadleaved Woodland	WD1	Moderate Local	Areas of value to local wildlife.
Wet Willow-Alder-Ash Woodland	WN6	High Local	Important for a number of wetland plants but also birds, reptiles and mammals.
Dry Calcareous and Neutral Grassland	GS1	Low Local	Small areas of generally species poor dry meadow grassland and grassy verges.

BLESSINGTON			
Ecological feature	**Fossitt code**	**Evaluation**	**Rationale**
Dry Meadow & Grassy Verges	GS2	Low Local	Small areas of generally species poor
Conifer Plantation	WD4	Low Local	Local wildlife value. Species poor.
Mixed Conifer Woodland	WD3	Moderate Local to Moderate Regional	No significance for plants and invertebrates but important for Red Squirrel and Pine Marten.
Mixed Conifer/Broadleaved Woodland	WD2	Moderate Local, Moderate Regional	No significance for plants and invertebrates but important for Red Squirrel and Pine Marten.
Wet Grassland	GS4	Moderate local in general. Higher where it forms part of a mixed wetland habitat mosaics	Small areas of semi-natural habitat or part of broader wetland areas.
Reed & Large Sedge Swamp	FS1	High Local	Diverse marginal marsh and reed swamp habitats.
Marsh	GM1	High Local	Diverse marginal marsh and reed swamp habitats.
Rich Fen & Flush	PF1	High Local	Species-rich wetland area.
Scrub	WS1	Moderate Local	Important cover for birds. Low diversity overall.
Depositing River	FW2	Moderate Local	Watercourse depositing to reservoir.
Sand Marten Colonies	N/A	High Local	Protected species under national and international legislation.

9.2.5 Conservation Evaluation: Section 5: Ballyknockan

Table 24: Conservation evaluation: Section 5: Ballyknockan

BALLYKNOCKAN			
Ecological feature	**Fossitt code**	**Evaluation**	**Rationale**
Poulaphouca Reservoir	FL7	International	Site designated as a SPA.
Treelines	WL2	High local	Mature treelines. Ecological corridor.
Exposed Sand, Gravel & Till	ED1	Moderate Local	Not a widespread habitat type.
Immature Woodland	WS2	Low Local	Low in its current state but its diversity will increase with time.
Buildings and Artificial Surfaces	BL3	Low Local	None or limited vegetation.
Dense Bracken	HD1	Low Local	Low species diversity and ability to support other species.
Mixed Broadleaved Woodland	WD1	Moderate Local	Areas of value to local wildlife.
Wet Willow-Alder-Ash Woodland	WN6	High Local	Important for a number of wetland plants but also birds, reptiles and mammals.
Dry Calcareous and Neutral Grassland	GS1	Low Local	Small areas of generally species poor dry meadow grassland and grassy verges.

BALLYKNOCKAN			
Ecological feature	**Fossitt code**	**Evaluation**	**Rationale**
Conifer Plantation	WD4	Low Local	Local wildlife value. Species poor.
Mixed Conifer Woodland	WD3	Moderate Local to Moderate Regional	No significance for plants and invertebrates but important for Red Squirrel and Pine Marten.
Mixed Conifer/Broadleaved Woodland	WD2	Moderate Local, Moderate Regional	No significance for plants and invertebrates but important for Red Squirrel and Pine Marten.
Improved agricultural grassland	GA1	Low Local	Generally, highly modified and species poor.
Depositing River	FW2	Moderate Local	Watercourse depositing to reservoir.

9.2.6 Conservation Evaluation: Section 6: Lacken

Table 25: Conservation Evaluation: Section 6: Lacken

LACKEN			
Ecological feature	**Fossitt code**	**Evaluation**	**Rationale**
Poulaphouca Reservoir	FL7	International	Site designated as a SPA.
Treelines	WL2	High local	Mature treelines. Ecological corridor.
Exposed Sand, Gravel & Till	ED1	Moderate Local	Not a widespread habitat type.
Dense Bracken	HD1	Low Local	Low species diversity and ability to support other species.
Buildings and Artificial Surfaces	BL3	Low Local	None or limited vegetation.
Mixed Broadleaved Woodland	WD1	Moderate Local	Areas of value to local wildlife.
Wet Willow-Alder-Ash Woodland	WN6	High Local	Important for a number of wetland plants but also birds, reptiles and mammals.
Dry Calcareous and Neutral Grassland	GS1	Low Local	Small areas of generally species poor dry meadow grassland and grassy verges.
Conifer Plantation	WD4	Low Local	Local wildlife value. Species poor.

LACKEN			
Ecological feature	**Fossitt code**	**Evaluation**	**Rationale**
Mixed Conifer Woodland	WD3	Moderate Local to Moderate Regional	No significance for plants and invertebrates but important for Red Squirrel and Pine Marten.
Mixed Conifer/Broadleaved Woodland	WD2	Moderate Local, Moderate Regional	No significance for plants and invertebrates but important for Red Squirrel and Pine Marten.
Wet Grassland	GS4	Moderate local in general. Higher where it forms part of a mixed wetland habitat mosaics	Small areas of semi-natural habitat or part of broader wetland areas.
Improved agricultural grassland	GA1	Low Local	Generally, highly modified and species poor.
Depositing River	FW2	Moderate Local	Watercourse depositing to reservoir.
Scrub	WS1	Moderate Local	Important cover for birds. Low diversity overall.

9.3 Blessington eGreenway Impact Assessment

The potential impacts on the ecological features identified for each of the proposed route sections are given in the following tables.

9.3.1 Impact Assessment: Section 1. Valleymount

Table 26: Impact Assessment: Section 1: Valleymount

VALLEYMOUNT				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Poulaphouca Reservoir	International	Disturbance to bird species during construction.	Negligible*	Short-term/Unlikely
Exposed Sand, Gravel & Till	Moderate Local	No impacts predicted	None	None
Treelines	High local	-Some mature treelines will be partially removed. - Some treelines will be pruned/cut back	Negligible	Long-term / Likely
Dense Bracken	Low Local	Some will be lost	Negligible	Long-term/ Likely
Buildings and Artificial Surfaces	Low Local	- No impacts predicted	None	None
Mixed Broadleaved Woodland	Moderate Local	- Woodland area may be reduced in size or thinned of woody species	Minor Adverse	Long-term / Likely

VALLEYMOUNT				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Wet Willow-Alder-Ash Woodland	High Local	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Dry Meadows & Grassy Verges	Low Local	Some will be lost	Negligible	Long-term/ Likely
Conifer Plantation	Low Local	Some will be lost	Negligible	Long-term/ Likely
Mixed Conifer Woodland	Moderate Local to Moderate Regional	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Mixed Conifer/Broadleaved Woodland	Moderate Local, Moderate Regional	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Depositing River	Moderate Local	Works may cause temporary pollution	Minor adverse	Temporary/Unlikely
Scrub	Moderate Local	- Area of scrub will be reduced in size	Minor Adverse	Long-term/Likely
Badger Sett	High Local	Disturbance or displacement of protected species	Minor Adverse	Long-term / Likely

* See conclusions on impacts drawn in Blessington eGreenway Natura Impact Statement (NIS)

9.3.2 Impact Assessment: Section 2: Tulfarris

Table 27: Impact Assessment: Section 2: Tulfarris

TULFARRIS				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Treelines	High local	-Some mature treelines will be partially removed. - Some treelines will be pruned/cut back	Negligible	Long-term / Possible
Buildings and Artificial Surfaces	Low Local	- No impacts predicted	None	None
Mixed Broadleaved Woodland	Moderate Local	- Woodland area may be reduced in size or thinned of woody species	Minor Adverse	Long-term / Possible
Conifer Plantation	Low Local	Some will be lost	Negligible	Long-term/ Possible
Mixed Conifer/Broadleaved Woodland	Moderate Local, Moderate Regional	- Woodland area may be reduced in size	Minor Adverse	Long-term/Possible
Wet Grassland	Moderate local in general.	Some may be lost	Negligible	Long-term/ Possible
Improved agricultural grassland	Low Local	Some may be lost	Negligible	Long-term / Unlikely

TULFARRIS				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Amenity Grassland	Low Local	Some will be lost	Negligible	Long-term/ Likely
Rich Fen & Flush	High Local	- No impacts predicted	None	None

9.3.3 Impact Assessment: Section 3: Baltyboys

Table 28: Impact Assessment: Section 3. Baltyboys

BALTYBOYS				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Poulaphouca Reservoir	International	Disturbance to bird species during construction.	Negligible	Short-term/Possible
Treelines	High local	-Some mature treelines will be partially removed. - Some treelines will be pruned/cut back	Negligible	Long-term / Likely
Exposed Sand, Gravel & Till	Moderate Local	No impacts predicted	None	None
Dense Bracken	Low Local	Some will be lost	Negligible	Long-term/ Likely

BALTYBOYS				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Buildings and Artificial Surfaces	Low Local	- No impacts predicted	None	None
Mixed Broadleaved Woodland	Moderate Local	- Woodland area may be reduced in size or thinned of woody species	Minor Adverse	Long-term / Likely
Wet Willow-Alder-Ash Woodland	High Local	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Dry Calcareous and Neutral Grassland	Low Local	Some will be lost	Minor Adverse	Long-term/ Likely
Conifer Plantation	Low Local	Some will be lost	Negligible	Long-term/ Likely
Mixed Conifer Woodland	Moderate Local to Moderate Regional	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Mixed Conifer/Broadleaved Woodland	Moderate Local, Moderate Regional	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely

BALTYBOYS				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Wet Grassland	Moderate local in general. Higher where it forms part of a mixed wetland habitat mosaics	No impacts predicted	None	None
Improved agricultural grassland	Low Local	Some may be lost	Negligible	Long-term / Unlikely
Amenity Grassland	Low Local	Some will be lost	Negligible	Long-term/ Likely
Depositing River	Moderate Local	Works may cause temporary pollution	Minor adverse	Temporary/Unlikely
Scrub	Moderate Local	- Area of scrub will be reduced in size	Minor Adverse	Long-term/Likely
Badger Sett	High Local	Disturbance or displacement of protected species	Minor Adverse	Long-term / Likely

9.3.4 Impact Assessment: Section 4: Blessington

Table 29: Impact Assessment: Section 4: Blessington

BLESSINGTON				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Poulaphouca Reservoir	International	Disturbance to bird species during construction.	Negligible	Short-term/Unlikely
Treelines	High local	-Some mature treelines will be partially removed. - Some treelines will be pruned/cut back	Negligible	Long-term / Likely
Hedgerows	High local	- Some hedgerows will be partially removed. - Some hedgerows will be pruned/cut back	Negligible	Medium-term / Likely
Buildings and Artificial Surfaces	Low Local	- No impacts predicted	None	None
Improved agricultural grassland	Low Local	Some may be lost	Negligible	Long-term / Unlikely
Amenity Grassland	Low Local	Some will be lost	Negligible	Long-term/ Likely
Exposed Sand, Gravel & Till	Moderate Local	No impacts predicted	None	None

BLESSINGTON				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Dense Bracken	Low Local	Some will be lost	Negligible	Long-term/ Likely
Mixed Broadleaved Woodland	Moderate Local	- Woodland area may be reduced in size or thinned of woody species	Minor Adverse	Long-term / Likely
Wet Willow-Alder-Ash Woodland	High Local	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Dry Calcareous and Neutral Grassland	Low Local	Some will be lost	Minor Adverse	Long-term/ Likely
Dry Meadow & Grassy Verges	Low Local	Some will be lost	Negligible	Long-term/ Likely
Conifer Plantation	Low Local	Some will be lost	Negligible	Long-term/ Likely
Mixed Conifer Woodland	Moderate Local to Moderate Regional	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Mixed Conifer/Broadleaved Woodland	Moderate Local, Moderate Regional	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Wet Grassland	Moderate local in general. Higher where it forms part of a mixed wetland habitat mosaics	No impacts predicted	None	None

BLESSINGTON				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Reed & Large Sedge Swamp	High Local	No impacts predicted	None	None
Depositing River	Moderate Local	Works may cause temporary pollution	Minor adverse	Temporary/Unlikely
Marsh	High Local	No impacts predicted	None	None
Rich Fen & Flush	High Local	No impacts predicted	None	None
Scrub	Moderate Local	- Area of scrub will be reduced in size	Minor Adverse	Long-term/Likely
Sand Marten Colonies	High Local	No impacts predicted	None	None

9.3.5 Impact Assessment: Section 5: Ballyknockan

Table 30: Impact Assessment: Section 5: Ballyknockan

BALLYKNOCKAN				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Poulaphouca Reservoir	International	Disturbance to bird species during construction.	Negligible	Short-term/Unlikely
Treelines	High local	-Some mature treelines will be partially removed. - Some treelines will be pruned/cut back	Negligible	Long-term / Likely
Exposed Sand, Gravel & Till	Moderate Local	No impacts predicted	None	None
Immature Woodland	Low Local	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Buildings and Artificial Surfaces	Low Local	- No impacts predicted	None	None
Dense Bracken	Low Local	Some will be lost	Negligible	Long-term/ Likely

BALLYKNOCKAN				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Mixed Broadleaved Woodland	Moderate Local	- Woodland area may be reduced in size or thinned of woody species	Minor Adverse	Long-term / Likely
Wet Willow-Alder-Ash Woodland	High Local	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Dry Calcareous and Neutral Grassland	Low Local	Some will be lost	Minor Adverse	Long-term/ Likely
Conifer Plantation	Low Local	Some will be lost	Negligible	Long-term/ Likely
Mixed Conifer Woodland	Moderate Local to Moderate Regional	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Mixed Conifer/Broadleaved Woodland	Moderate Local, Moderate Regional	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Depositing River	Moderate Local	Works may cause temporary pollution	Minor adverse	Temporary/Unlikely
Improved agricultural grassland	Low Local	Some may be lost	Negligible	Long-term / Unlikely

9.3.6 Impact Assessment: Section 6: Lacken

Table 31: Impact Assessment: Section 6: Lacken

LACKEN				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Poulaphouca Reservoir	International	Disturbance to bird species during construction.	Negligible	Short-term/Unlikely
Treelines	High local	-Some mature treelines will be partially removed. - Some treelines will be pruned/cut back	Negligible	Long-term / Likely
Exposed Sand, Gravel & Till	Moderate Local	No impacts predicted	None	None
Dense Bracken	Low Local	Some will be lost	Negligible	Long-term/ Likely
Buildings and Artificial Surfaces	Low Local	- No impacts predicted	None	None
Mixed Broadleaved Woodland	Moderate Local	- Woodland area may be reduced in size or thinned of woody species	Minor Adverse	Long-term / Likely

LACKEN				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Wet Willow-Alder-Ash Woodland	High Local	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Dry Calcareous and Neutral Grassland	Low Local	Some will be lost	Minor Adverse	Long-term/ Likely
Conifer Plantation	Low Local	Some will be lost	Negligible	Long-term/ Likely
Mixed Conifer Woodland	Moderate Local to Moderate Regional	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Mixed Conifer/Broadleaved Woodland	Moderate Local, Moderate Regional	- Woodland area may be reduced in size	Minor Adverse	Long-term/Likely
Depositing River	Moderate Local	Works may cause temporary pollution	Minor adverse	Temporary/Unlikely

LACKEN				
Ecological feature	**Evaluation**	**Nature of Impact**	**Significance**	**Duration & Likelihood**
Wet Grassland	Moderate local in general. Higher where it forms part of a mixed wetland habitat mosaics	No impacts predicted	None	None
Improved agricultural grassland	Low Local	Some may be lost	Negligible	Long-term / Unlikely
Scrub	Moderate Local	- Area of scrub will be reduced in size	Minor Adverse	Long-term/Likely

10 DISCUSSION OF IMPACT ASSESSMENT

10.1 Impact on Habitats

Impacts upon habitats types within which the Greenway corridor will be constructed are considered to be *Minor Adverse* or lesser significance, given the conservation value of the habitat types which are likely to be impacted upon by the proposed construction and operation of the Greenway. These habitat types include, Dry meadow and grassy verges (GS2), Conifer Plantation (WD4), Mixed Conifer Woodland (WD3), Mixed broadleaved/conifer woodland (WD2) and Scrub(WS1). These habitats were in general highly modified and managed or with limited semi-natural features that would increase their overall sensitivity.

Impacts of *Minor Adverse* significance may also be expected on habitats such as Hedgerows (WL1), Treelines (WL2) and Wet willow-alder-ash woodland (WN6) and Mixed Broadleaved woodland (WD1) where the Greenway is routed through these habitat types. Some impacts here are therefore likely.

Impacts on more ecologically valuable habitats including Marsh GM1, Reed and large Sedge Swamp (FS1), Depositing lowland streams (FW2), Wet Grassland (GS4) and Rich fen and flush (PF1) have not been predicted as likely. This will be due to avoidance of these areas in the route planning of the Greenway as well as adherence to good work practices.

The overall impact significance of the Proposed Development upon these habitats (taken as a whole) can therefore be considered to be *Minor Adverse*. The proposed route known at the time of writing generally avoids areas conforming to wetland habitat types. This is likely a practical consideration as most of the above habitat types are wet and would be difficult to construct the greenway upon. In some areas crossing these habitat types may be unavoidable but generally the route only impacts very limited areas of these habitat types. Measures to mitigate these impacts are given in the following section.

11 IMPACT MITIGATION

Mitigation measures to address the potential impacts as detailed above on the ecological features of each of the proposed route sections are given in the following tables.

11.1.1 Mitigation Measures Section 1: Valleymount

Table 32: Mitigation Measures Section 1: Valleymount

VALLEYMOUNT		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Poulaphouca Reservoir	Disturbance to bird species during construction.	-Timing of works to avoid breeding season. - Area of works to be limited. - Working hours to be limited. - No works to take place within the SPA.
Exposed Sand, Gravel & Till	No impacts predicted	- Works area to be delineated to preclude any impacts to this habitat type. - No storage of equipment, transporting of materials in/across these areas.
Treelines	-Some mature treelines will be partially removed. - Some treelines will be pruned/cut back	-Removal of mature trees to be minimised. - Younger trees removed where possible. - Replanting to be carried out on like-for-like basis. - Pruning to be carried out at correct time of year.
Dense Bracken	Some will be lost	- Works area to be limited.
Buildings and Artificial Surfaces	- No impacts predicted	-Buildings to be avoided. - Additional surveys to be carried out if required.

VALLEYMOUNT		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Mixed Broadleaved Woodland	- Woodland area may be reduced in size or thinned of woody species	- Design is to allow retention of this habitat type insofar as possible. More mature trees are to be retained. - Design should allow maximum connectivity to be retained e.g. by keeping an amount of canopy cover - Further woodland areas are to be established outside the route areas.
Wet Willow-Alder-Ash Woodland	- Woodland area may be reduced in size	As above and: - Works to avoid this habitat type where possible. - Works area in this habitat to be strictly limited.
Dry Meadows & Grassy Verges	Some will be lost	Replanting and management schemes to be drawn up to allow habitat recreation.
Conifer Plantation	Some will be lost	- Design should allow some connectivity to be retained e.g. by keeping an amount of canopy cover. - WCC are to carry out a replanting of wind-thrown areas with native tree species.
Mixed Conifer Woodland	- Woodland area may be reduced in size	- Design should allow some connectivity to be retained e.g. by keeping an amount of canopy cover. - WCC to carry out a tree-planting programme along route through ESB lands.

VALLEYMOUNT		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Mixed Conifer/Broadleaved Woodland	- Woodland area may be reduced in size	- Design is to allow retention of this habitat type insofar as possible. More mature trees are to be retained. - Design should allow maximum connectivity to be retained e.g. by keeping an amount of canopy cover - Further woodland areas are to be established outside the route areas.
Depositing River	Works may cause temporary pollution	-Best practice methodologies to be followed for watercourse crossings -Works to be carried out under ecologist supervision.
Scrub	- Area of scrub will be reduced in size	- Works area to be limited. - Native species used in reinstatement.
Badger Sett	Disturbance or displacement of protected species	- Route to accommodate sett retention where possible. - Route design is to minimise sett disturbance. - Sett exclusion to be carried out under licence. - Artificial setts will be created where necessary. - Measures to protect setts to be planned in consultation with NPWS.

11.1.2 Mitigation Measures Section 2: Tulfarris

Table 33: Mitigation Measures Section 2: Tulfarris

TULFARRIS		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Treelines	-Some mature treelines will be partially removed. - Some treelines will be pruned/cut back	-Removal of mature trees to be minimised. - Younger trees removed where possible. - Replanting to be carried out on like-for-like basis. - Pruning to be carried out at correct time of year.
Buildings and Artificial Surfaces	- No impacts predicted	-Buildings to be avoided. - Additional surveys to be carried out if required.
Mixed Broadleaved Woodland	- Woodland area may be reduced in size or thinned of woody species	- Design is to allow retention of this habitat type insofar as possible. More mature trees are to be retained. - Design should allow maximum connectivity to be retained e.g. by keeping an amount of canopy cover. - Further woodland areas are to be established outside the route areas.
Conifer Plantation	Some will be lost	- Design should allow some connectivity to be retained e.g. by keeping an amount of canopy cover. - WCC are to carry out a replanting of wind-thrown areas with native tree species.

TULFARRIS		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Mixed Conifer/Broadleaved Woodland	- Woodland area may be reduced in size	- Design is to allow retention of this habitat type insofar as possible. More mature trees are to be retained. - Design should allow maximum connectivity to be retained e.g. by keeping an amount of canopy cover. - WCC to carry out a tree-planting programme along route through ESB lands.
Wet Grassland	Some may be lost	- Works area to be delineated to preclude any impacts to this habitat type.
Improved agricultural grassland	Some may be lost	- Works area to be limited.
Amenity Grassland	Some will be lost	- Works area to be limited.
Rich Fen & Flush	- No impacts predicted	- Works area to be delineated to preclude any impacts to this habitat type.

11.1.3 Mitigation Measures Section 3: Baltyboys

Table 34: Mitigation Measures Section 3: Baltyboys

BALTYBOYS		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Poulaphouca Reservoir	Disturbance to bird species during construction.	-Timing of works to avoid breeding season. - Area of works to be limited. - Working hours to be limited.
Treelines	-Some mature treelines will be partially removed. - Some treelines will be pruned/cut back	-Removal of mature trees to be minimised. - Younger trees removed where possible. - Replanting to be carried out on like-for-like basis. - Pruning to be carried out at correct time of year.
Exposed Sand, Gravel & Till	No impacts predicted	- Works area to be delineated to preclude any impacts to this habitat type. - No storage of equipment, transporting of materials in/across these areas.
Dense Bracken	Some will be lost	- Works area to be limited.
Buildings and Artificial Surfaces	- No impacts predicted	-Buildings to be avoided. - Additional surveys to be carried out if required.

BALTYBOYS		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Mixed Broadleaved Woodland	- Woodland area may be reduced in size or thinned of woody species	- Design is to allow retention of this habitat type insofar as possible. More mature trees are to be retained. - Design should allow maximum connectivity to be retained e.g. by keeping an amount of canopy cover. - Further woodland areas are to be established outside the route areas.
Wet Willow-Alder-Ash Woodland	- Woodland area may be reduced in size	As above and: - Works to avoid this habitat type where possible. - Works area in this habitat to be strictly limited.
Dry Calcareous and Neutral Grassland	Some will be lost	- Topsoil salvage to be carried out. - Replanting and management schemes to be drawn up to allow habitat recreation.
Conifer Plantation	Some will be lost	- Design should allow some connectivity to be retained e.g. by keeping an amount of canopy cover. - WCC are to carry out a replanting of wind-thrown areas with native tree species.

BALTYBOYS		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Mixed Conifer Woodland	- Woodland area may be reduced in size	- Design should allow some connectivity to be retained e.g. by keeping an amount of canopy cover. - WCC to carry out a tree-planting programme along route through ESB lands.
Mixed Conifer/Broadleaved Woodland	- Woodland area may be reduced in size	- Design is to allow retention of this habitat type insofar as possible. More mature trees are to be retained. - Design should allow maximum connectivity to be retained e.g. by keeping an amount of canopy cover. - Further woodland areas are to be established outside the route areas.
Wet Grassland	No impacts predicted	- Works area to be delineated to preclude any impacts to this habitat type.
Improved agricultural grassland	Some may be lost	- Works area to be limited.
Depositing River	Works may cause temporary pollution	-Best practice methodologies to be followed for watercourse crossings -Works to be carried out under ecologist supervision.
Amenity Grassland	Some will be lost	- Works area to be limited.

BALTYBOYS		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Scrub	- Area of scrub will be reduced in size	- Works area to be limited. - Native species used in reinstatement.
Badger Sett	Disturbance or displacement of protected species	- Route to accommodate sett retention where possible. - Route design is to minimise sett disturbance. - Sett exclusion to be carried out under licence. - Artificial setts will be created where necessary. - Measures to protect setts to be planned in consultation with NPWS.

11.1.4 Mitigation Measures Section 4: Blessington

Table 35: Mitigation Measures Section 4: Blessington

BLESSINGTON		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Poulaphouca Reservoir	Disturbance to bird species during construction.	-Timing of works to avoid breeding season. - Area of works to be limited. - Working hours to be limited.
Treelines	-Some mature treelines will be partially removed. - Some treelines will be pruned/cut back	-Removal of mature trees to be minimised. - Younger trees removed where possible. - Replanting to be carried out on like-for-like basis. - Pruning to be carried out at correct time of year.
Hedgerows	- Some hedgerows will be partially removed. - Some hedgerows will be pruned/cut back	- Mature hedgerows retained where possible. - Native species used in reinstatement. - Pruning to be carried out at correct time of year.
Buildings and Artificial Surfaces	- No impacts predicted	-Buildings to be avoided. - Additional surveys to be carried out if required.
Improved agricultural grassland	Some may be lost	- Works area to be limited.
Amenity Grassland	Some will be lost	- Works area to be limited.

BLESSINGTON		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Exposed Sand, Gravel & Till	No impacts predicted	- Works area to be delineated to preclude any impacts to this habitat type. - No storage of equipment, transporting of materials in/across these areas.
Dense Bracken	Some will be lost	- Works area to be limited.
Mixed Broadleaved Woodland	- Woodland area may be reduced in size or thinned of woody species	- Design is to allow retention of this habitat type insofar as possible. More mature trees are to be retained. - Design should allow maximum connectivity to be retained e.g. by keeping an amount of canopy cover. - Further woodland areas are to be established outside the route areas.
Wet Willow-Alder-Ash Woodland	- Woodland area may be reduced in size	As above and: - Works to avoid this habitat type where possible. - Works area in this habitat to be strictly limited. - WCC to carry out a tree-planting programme along route through ESB lands.
Dry Calcareous and Neutral Grassland	Some will be lost	- Topsoil salvage to be carried out. - Replanting and management schemes to be drawn up to allow habitat recreation.
Dry Meadow & Grassy Verges	Some will be lost	Replanting and management schemes to be drawn up to allow habitat recreation.

BLESSINGTON		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Conifer Plantation	Some will be lost	- Design should allow some connectivity to be retained e.g. by keeping an amount of canopy cover. - WCC are to carry out a replanting of wind-thrown areas with native tree species.
Mixed Conifer Woodland	- Woodland area may be reduced in size	- Design should allow some connectivity to be retained e.g. by keeping an amount of canopy cover. - WCC are to carry out a replanting of wind-thrown areas with native tree species.
Mixed Conifer/Broadleaved Woodland	- Woodland area may be reduced in size	- Design is to allow retention of this habitat type insofar as possible. More mature trees are to be retained. - Design should allow maximum connectivity to be retained e.g. by keeping an amount of canopy cover. - Further woodland areas are to be established outside the route areas.
Wet Grassland	No impacts predicted	- Works area to be delineated to preclude any impacts to this habitat type.
Reed & Large Sedge Swamp	No impacts predicted	- Works area to be delineated to preclude any impacts to this habitat type.
Marsh	No impacts predicted	- Works area to be delineated to preclude any impacts to this habitat type.

BLESSINGTON		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Rich Fen & Flush	No impacts predicted	- Works area to be delineated to preclude any impacts to this habitat type.
Depositing River	Works may cause temporary pollution	-Best practice methodologies to be followed for watercourse crossings -Works to be carried out under ecologist supervision.
Scrub	- Area of scrub will be reduced in size	- Works area to be limited. - Native species used in reinstatement.
Sand Marten Colonies	No impacts predicted	- Works area to be delineated to preclude any impacts to these areas. -Timing of works to avoid breeding season. - Working hours to be limited. - 'Artificial' banks may be created.

11.1.5 Mitigation Measures Section 5: Ballyknockan

Table 36: Mitigation Measures Section 5: Ballyknockan

BALLYKNOCKAN		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Poulaphouca Reservoir	Disturbance to bird species during construction.	-Timing of works to avoid breeding season. - Area of works to be limited. - Working hours to be limited.
Treelines	-Some mature treelines will be partially removed. - Some treelines will be pruned/cut back	-Removal of mature trees to be minimised. - Younger trees removed where possible. - Replanting to be carried out on like-for-like basis. - Pruning to be carried out at correct time of year.
Exposed Sand, Gravel & Till	No impacts predicted	- Works area to be delineated to preclude any impacts to this habitat type. - No storage of equipment, transporting of materials in/across these areas.
Immature Woodland	- Woodland area may be reduced in size	- Design is to allow retention of this habitat type insofar as possible. More mature trees are to be retained. - WCC to carry out a tree-planting programme along route through ESB lands.
Buildings and Artificial Surfaces	- No impacts predicted	-Buildings to be avoided. - Additional surveys to be carried out if required.
Dense Bracken	Some will be lost	- Works area to be limited.

BALLYKNOCKAN		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Mixed Broadleaved Woodland	- Woodland area may be reduced in size or thinned of woody species	- Design is to allow retention of this habitat type insofar as possible. More mature trees are to be retained. - Design should allow maximum connectivity to be retained e.g. by keeping an amount of canopy cover. - Further woodland areas are to be established outside the route areas.
Wet Willow-Alder-Ash Woodland	- Woodland area may be reduced in size	As above and: - Works to avoid this habitat type where possible. - Works area in this habitat to be strictly limited.
Dry Calcareous and Neutral Grassland	Some will be lost	- Topsoil salvage to be carried out. - Replanting and management schemes to be drawn up to allow habitat recreation.
Conifer Plantation	Some will be lost	- Design should allow some connectivity to be retained e.g. by keeping an amount of canopy cover. - WCC are to carry out a replanting of wind-thrown areas with native tree species.
Mixed Conifer Woodland	- Woodland area may be reduced in size	Design should allow some connectivity to be retained e.g. by keeping an amount of canopy cover. - WCC to carry out a tree-planting programme along route through ESB lands.

BALLYKNOCKAN		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Mixed Conifer/Broadleaved Woodland	- Woodland area may be reduced in size	- Design is to allow retention of this habitat type insofar as possible. More mature trees are to be retained. - Design should allow maximum connectivity to be retained e.g. by keeping an amount of canopy cover. - Further woodland areas are to be established outside the route areas.
Depositing River	Works may cause temporary pollution	-Best practice methodologies to be followed for watercourse crossings. -Works to be carried out under ecologist supervision.
Improved agricultural grassland	Some may be lost	- Works area to be limited.

11.1.6 Mitigation Measures Section 6: Lacken

Table 37: Mitigation Measures Section 6: Lacken

LACKEN		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Poulaphouca Reservoir	Disturbance to bird species during construction.	-Timing of works to avoid breeding season. - Area of works to be limited. - Working hours to be limited.
Treelines	-Some mature treelines will be partially removed. - Some treelines will be pruned/cut back	-Removal of mature trees to be minimised. - Younger trees removed where possible. - Replanting to be carried out on like-for-like basis. - Pruning to be carried out at correct time of year.
Exposed Sand, Gravel & Till	No impacts predicted	- Works area to be delineated to preclude any impacts to this habitat type. - No storage of equipment, transporting of materials in/across these areas.
Dense Bracken	Some will be lost	- Works area to be limited.
Buildings and Artificial Surfaces	- No impacts predicted	-Buildings to be avoided. - Additional surveys to be carried out if required.

LACKEN		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Mixed Broadleaved Woodland	- Woodland area may be reduced in size or thinned of woody species	- Design is to allow retention of this habitat type insofar as possible. More mature trees are to be retained. - Design should allow maximum connectivity to be retained e.g. by keeping an amount of canopy cover. - WCC to carry out a tree-planting programme along route through ESB lands.
Wet Willow-Alder-Ash Woodland	- Woodland area may be reduced in size	As above and: - Works to avoid this habitat type where possible. - Works area in this habitat to be strictly limited.
Dry Calcareous and Neutral Grassland	Some will be lost	- Topsoil salvage to be carried out. - Replanting and management schemes to be drawn up to allow habitat recreation.
Conifer Plantation	Some will be lost	Design should allow some connectivity to be retained e.g. by keeping an amount of canopy cover. - WCC are to carry out a replanting of wind-thrown areas with native tree species.
Mixed Conifer Woodland	- Woodland area may be reduced in size	Design should allow some connectivity to be retained e.g. by keeping an amount of canopy cover. - WCC to carry out a tree-planting programme along route through ESB lands.

LACKEN		
Ecological feature	**Nature of Impact**	**Recommended Mitigation Measures**
Mixed Conifer/Broadleaved Woodland	- Woodland area may be reduced in size	- Design is to allow retention of this habitat type insofar as possible. More mature trees are to be retained. - Design should allow maximum connectivity to be retained e.g. by keeping an amount of canopy cover. - Further woodland areas are to be established outside the route areas.
Wet Grassland	No impacts predicted	- Works area to be delineated to preclude any impacts to this habitat type.
Depositing River	Works may cause temporary pollution	-Best practice methodologies to be followed for watercourse crossings -Works to be carried out under ecologist supervision.
Improved agricultural grassland	Some may be lost	- Works area to be limited.
Scrub	- Area of scrub will be reduced in size	- Works area to be limited. - Native species used in reinstatement.

Impacts on fauna and other ecological receptors are given in the following section.

12 IMPACTS AND MITIGATION: FAUNA AND OTHER SPECIES GROUPS

12.1 Badgers

It is essential that the construction and operation of the Greenway does not lead to the disturbance to the natural function, home range or feeding patterns of a number of mammalian species protected by law.

Badger activity was recorded within and surrounding the proposed route at a number of locations. This survey identified the presence of Setts within the boundary of the Greenway route and recorded signs of tracks, latrines or foraging. Additional survey work is required to identify whether a number of possible setts identified are still active or abandoned, or if any additional setts have been created. A full list of all Badger setts and activities recorded within the survey area can be seen in Appendix B.

Badgers and their refugia are protected under the Wildlife (Amendment) Act 2000 and the Wildlife Act 1976 and by European legislation. Sett locations and additional details are to be given to the NPWS but are to otherwise remain confidential as illegal persecution of badgers remains an issue in Ireland. This should be considered during the design process of the Greenway. All efforts should be made not to disturb badger setts where possible, through the use of fencing and limiting clearance and disturbance activities in sett areas. An application for a derogation to exclude and/or remove setts (where deemed necessary by the ecologist) should be applied for at the appropriate time.

12.1.1 Potential Impacts upon Badger Population

A total of 3 no. sett complexes were identified that will all be directly affected by the Proposed Development. These Setts are within the Site. Disturbance to badgers has been identified as likely. This could be of *long-term* duration. If the route design cannot avoid the Sett areas, the setts may require exclusion. This is detailed in the following section.

12.1.2 Mitigation for Badger Setts including Exclusions

All setts within the Site were recorded and made known to the resident/project engineer and representatives of the client and all site operatives as to their whereabouts and how to work within their area. No disturbance should take place to any active or inactive setts within these areas as part of the Proposed Development during the breeding season: December to June (inclusive).

The client and representatives should be kept informed of any changes to the status of setts throughout the course of works. The local ranger of NPWS shall also be informed of any such changes.

Vulnerable Setts are to be protected during site clearance and subsequent works. A competent ecologist must be present when works are taking place within the vicinity of these Setts. Long-term mitigation measures e.g. badger underpasses, badger-proof fencing, development of compensation areas and development of artificial badger Setts are to be drawn up and agreed upon in consultation with Wicklow County Council where applicable. These will mitigate against long-term impacts such as loss of foraging areas and territory disruption. These shall be overseen by a qualified ecologist. Clearance constraints for each recorded sett are given below.

Setts exclusions and excavations, if required, will be carried out by ecologists under licence issued by the NPWS. Timing of these works will depend on the programme of works and mitigation required. Main Setts may need to be replaced with an artificial Sett. These are not complex and can be an extremely successful mitigation tool. These can be located within the corridor and be placed away from the route to minimise disturbance. Artificial Setts should be built before exclusion of the sett being replaced. Bedding from the original sett can be placed in the new sett if possible. Exclusions can take place post breeding and rearing from July to November inclusive. Active Setts can take up to 21 days to exclude using 1-way gates.

Where exclusion is not required guidance for site works in the vicinity of badger setts is available in the NRA guidance entitled "Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes". This guidance outlines provisions that should apply to all construction works. The guidance notes that Badger sett tunnel systems can extend up to approximately 20 m from sett entrances and as such

- No heavy machinery should be used within 30 m of badger setts (unless carried out under licence)
- Lighter machinery (generally wheeled vehicles) should not be used within 20 m of a sett entrance
- Light work, such as digging by hand or scrub clearance should not take place within 10 m of sett entrances

During the breeding season (December to June inclusive), the works listed above should not occur within 50 m of active setts nor blasting or pile driving within 150 m of active setts. It should be noted that in almost all circumstances, works close to badger setts may only be conducted under the supervision of a qualified expert under licence from the NPWS.

12.2 Bats

All bat species are protected by law in Ireland under the Bonn Convention (1992), the Bern Convention (1982) the EU 'Habitats' Directive (92/43/EC; transposed into Irish law by S.I. No. 94 of 1997) and the Wildlife Acts 1976 and 2000. Lesser Horseshoe Bats are listed as Annex II species of the Habitats Directive (afforded special protection). All other Irish bat species are listed in Annex IV (general protection) of this Directive.

A survey of all potential bat roosting habitats was undertaken. Such habitat areas include buildings, old stone walls, bridges, mature trees and souterrains. The Greenway route and its surroundings offer a wide range of landscape features that could provide feeding and some roosting opportunities for bats. Feeding and foraging habitats include rivers, lakes, woodlands, hedgerows, and wet grasslands. The majority of Irish bat species are known

to use linear semi-natural landscape features like rivers and hedgerows for feeding and navigation particularly in areas of intensive agriculture. As such the Greenway is likely to be an important area for local bat populations.

This survey generally focused on old buildings, bridges and also highlights large specimen trees that may also provide roosting opportunities. Buildings that might offer suitable Bat roosting habitat was limited within the study area. One small building was noted in the Blessington Section opposite the Bishop's Lane turn off for the N81. If any alternations are planned for this building, bat surveys should firstly be conducted. However, this building is outside the area of the Proposed Development. An old underpass under the N81 was also recorded. This has been previously surveyed (by a member of the present team) and was recorded as not containing bats. A small number of small derelict buildings were found around the Site particularly within the Lacken section. None of these were found to have any bat roost potential.

A tree survey for bat potential was carried out along the proposed Greenway route. Mature specimen trees and mature Ivy growth either side of and within the clearance area was recorded as having Bat potential. All mature trees should be retained where possible across the route not only for bats but also for their overall habitat and amenity value. If any mature or Ivy covered trees as recorded within the study areas must be removed, they will firstly require a dedicated bat survey.

12.2.1 Impacts upon Bat Populations

The Proposed Development may be predicted as having some *minor adverse* impact upon bat populations. Of greatest significance is the loss of trees and scrub which are widely used by the majority of species found in Ireland. Impacts to feeding opportunities are likely due to losses of habitats for prey species depending on trees and scrub removed during clearance. All clearance works are due to take place during hibernation (November to March) and therefore direct impacts from clearing and constructions works should be *Negligible.*

Most of the vegetation within the boundary of the Site shall be maintained along the Greenway and as the linear nature of the corridor is to be maintained, impacts to Bats due to clearance should be low. Declines in the abundance of prey species is likely due to the associated removal of natural habitat. Minimising unnecessary removal of natural habitat as well as expanding the extent of natural habitat in some areas would reduce the impact of the development on bats.

It is understood that the Greenway is not proposed to be lit. Lighting can severely impact on bat roosting behaviour, foraging behaviour and commuting behaviour with knock-on effects on accessing feeding areas. Many species of bats forage along dark corridors like rivers and hedgerows and are known to stay clear of well-lit areas. If the Greenway or bridges are inappropriately lit, this can impact upon bats' home ranges. Bat vision is an important sense during dusk and dawn as bats begin to move to and from the roosting sites. Excessive luminance particularly around roosting sites can lead to bats being disorientated and can also lead to abandonment of roosts. Lighting can also impact feeding behaviour as prey species are drawn towards lights leading to a localised decrease in prey populations as most bat species will avoid well-lit areas.

12.2.2 Mitigation of Impacts upon Bat Populations

The proposed measures are intended to minimise the significance of negative impacts of the construction and operation of the Greenway on bats that roost in close proximity to the route or that use the route for feeding and connectivity through the landscape. Hence, bats need not roost in or near the route to be affected by its construction. Bats closest to the Greenway are most at risk of being affected by the development, the proposed measures are designed with the consideration of all local bat population that may possibly be affected. Minimising unnecessary removal of natural habitat as well as expanding the extent of natural habitat in some areas would reduce the impact of the development on bats. Installation of bat boxes on selected trees, bridges or other appropriate areas would have a positive influence on bat species.

Mature trees within the boundary and particularly those close to the clearance area have been recorded as they may contain bat roosts. Where a tree marked as a mature specimen cannot be retained, trees must be felled in an appropriate and sensitive manner in accordance with NRA guidelines (2005) for the treatment of bats. Such tree-felling will be supervised by an ecologist where required. Recorded tree roosts are generally excluded/felled during March to April or Sept to November in order to minimise potential impacts. Where this is not feasible an acceptable mitigation measure is for mature specimen trees, with bat habitat potential, to be felled are left for 24 hours to allow any bats to escape before being cut up or removed.

Where lights in non-built up areas are required to be installed these should conform to the following specifications:

- Lights should face down or be masked to avoid light hitting potential roosting areas.
- Lights should work on sensors
- LED lighting should be used
- Avoid lights that emit high levels of ultraviolet light or Metal Halide & Mercury vapour lights.
- Place shields or masking over the top to focus light away from roosts on navigation paths.
- Use Internal and external louvres to reduce light spillage.

12.3 Impacts on Protected Invertebrates

No protected invertebrate species were recorded during surveys. However, the plant Devil's-Bit Scabious (*Succisa pratensis*) was found to occur in several areas including those noted as Fen habitat particularly along the Blessington route section (Appendix A). This is the food plant of the Marsh Fritillary butterfly (*Euphydryis aurinia).* This European Habitats Directive Annex II species is the only insect in Ireland that is designated as Annex II, with it being a qualifying interest for fourteen SACs in Ireland.

In Ireland, the species relies solely on Devil's-Bit Scabious as its larval food plant. This is a plant of damp ground and often occurs in stands (mosaics) within areas of damp and wet grassland. Marsh Fritillary deposit eggs on the underside of *Succisa* leaves in mid-May, with the caterpillars then moving towards the base of the plant on hatching. A web is spun in which the larvae live gregariously and feed. The webs increase in size throughout the summer and are at their most conspicuous between August and October, which is the appropriate time of year to carry out larval web searches.

There were no larval webs found during the ecology surveys as these were either absent or inconspicuous at time of survey. It is reasonable to assume that this species may be widespread in some of the dry calcareous/neutral grassland around the reservoir. Devil's Bit Scabious was only recorded in the Lacken Route Section. Photographs of Marsh Fritillary larval webs on this plant were provided to the authors by the Conservation Ranger for North Wicklow. These were taken in grassland adjacent the Lacken Section. It is interesting to note that there is no record for this species in the NBDC database for the SPA (or for the adjacent 2 km square).

12.3.1 Impacts on Marsh Fritillary

Marsh Fritillary is thought to be widespread in Ireland. However, there is a paucity of information on its distribution, known sites and long-term monitoring of same. A database of findings from a national butterfly survey is held by the NBDC. The populations of this species are thought to fluctuate considerably (www.npws.ie). Colonies require a sufficient area of habitat so that the species can survive natural changes to habitats and the effects of parasites. Individual sites are thought to exist as part of a network of neighbouring sites that are used periodically as conditions permit. If there is suitable habitat over a sufficient area, colonies may persist for many years. Removal of the food plant and the habitats suitable for same could therefore result in moderate negative impacts for a long-term duration.

12.3.2 Mitigation of Impacts on Marsh Fritillary

Mitigation by avoidance of suitable habitat for this species is recommended. It is also recommended that a targeted survey for this food plant and larval webs is carried out at a suitable time of year. It is noted that at time of writing there are no records for Devil's Bit Scabious in the SPA or adjacent areas at Lacken. Translocation of turves from the suitable areas, including the food plant should be considered. English Nature (2005) has recorded numerous successful translocation projects when planning road schemes. These can have long-term benefits for some species. Mitigation by designing new habitat areas within the footprint of the Greenway project may be readily achieved. This could serve not only to expand on existing habitat patches but also to create 'stepping stone' habitat areas along the verges to facilitate colonisation. It was noted that much fallow grassland (grazed only by deer) exists within the eastern section of the proposed route. These areas would be highly suitable for the planting/seeding of Devil's Bit Scabious. Consideration could also be given to the seeding or plug-planting of this plant in other sections of the Greenway (post-construction) or in adjacent lands.

12.4 Trees and Other Vegetation

12.4.1 Trees

The route for the Proposed Development is predominantly woodland and scrub of varying degrees of naturalness. In some areas where woodland has naturally developed, Scrub woodland is becoming dominated by Ash, Willow, Elm, Sycamore, Crab Apple and Holly. Mature trees were common along the Greenway route and were often found as part of old hedgerows, on old estates or in existing woodland. The dominant woodland type however was conifer plantation of roughly 30 years of age. The Greenway route's trees and woodlands provide a variety of ecosystem services including shelter and feeding opportunities for birds, bats and other mammals providing deadwood for invertebrates and organic matter. Additionally, they add to the overall character of the Greenway for users by creating a sense of enclosure and age to the overall aesthetic appeal of the Proposed Development.

An Arboricultural survey was carried out as part of this assessment in February 2021. This has been provided to the client as a separate report. This survey included all trees within the footprint of the proposed route and trees outside this area but whose root systems may be affected by the development.

12.4.2 Impacts to Trees

An Arboricultural Survey and Assessment (ASA) prepared by Flynn Furney Environmental Consultants concluded that approximately 7,200 trees will be required to be removed to facilitate the greenway. This relatively high number is due to the considerable amount of conifer plantation, where trees occur in long stretches and in high densities along the proposed route.

Tree management activities undertaken on behalf of the ESB typically involve the clear felling of between 1,750 and 2,500 trees every 2/3 years. The ESB also conducts thinning activities which typically involves the removal of 75 to 225 trees every 2/3 years. Thus, tree felling occurs in this area as part of routine tree management activities.

The project will replace the approximately 7,265 trees that will be required to be felled to facilitate the scheme. This will involve planting new native species tree along the route in ESB lands (approximately 2,300 trees at 10 m centres over approx. 23 km), and new planting in lands adjacent to scheme owned by Wicklow County Council (at Knockieran Car Park, Burgage area and the Avon area) which will accommodate 4,965 trees.

The total number of trees that will require removal is detailed per route section in Table 38. The greater majority of these being semi-mature plantation conifers.

Table 38: Number of trees to be removed

Route Section	Habitat Description	Trees to be Removed
Blessington	Section 1 consists mainly of mixed deciduous woodland and is already an existing Greenway trail for a large part between Avon Rí and Russelstown.	791

Route Section	Habitat Description	Trees to be Removed
Baltyboys	Section 2 is significantly denser than section 1, being mostly semi-mature/mature deciduous woodland. Willow, ash, and alder are abundant with some Sitka spruce plantations.	653
Lacken	Section 3 is predominately conifer plantation, mostly scots pine and sitka spruce with deciduous trees throughout/between. One large open area over rock armour.	1,897
Ballyknocken	Section 4 is deciduous woodland with occasional small conifer plantations (spruce and pine).	1,561
Valleymount	Section 5 is similar to section 4 but with longer stretches of plantations that have begun to regenerate. There are large areas of windthrow in this section.	1,827
Tulfarris	Section 6 begins at the Tulfarris hotel and golf resort, there is an area of deciduous woodland bordering the golf course which then becomes conifer plantation as it runs parallel to private land. A large part of this section is on existing roads.	536
Total		7,265

The overall impact upon tree species is considered *minor adverse*. The removal of a large numbers of trees is an inevitable part of track clearance. The indirect impacts of tree removal include the losses of nest and roosting opportunities for birds and possibly bats in the longer term. Losses of food sources through decreases in seed, nut, and berry volumes and in invertebrates that are food sources for insectivorous mammals and birds.

12.4.3 Mitigation of Impacts to Trees

Detailed tree mitigation measures have been provided in the Arboricultural Survey and Assessment Report which has been supplied to the client along with this report. This details a range of general and specific mitigation measures for the protection of trees

during removal and site works. Some tree removal is an unavoidable consequence of the Proposed Development. The establishment of new areas of native species woodland, around the lake shore will be used to offset the losses of trees removed during construction.

Ecological constraints maps (Appendix A) that accompany this report indicate the location of specimen trees identified during this survey. These are trees of an exceptional age or aesthetic beauty, that offer potential roosting opportunities for bats or birds, or exceptional feeding opportunities for birds or mammals. Site operatives and site managers involved in clearance works should be made familiar with the location of such trees within the vicinity of their works areas and should be able to identify species even if no leaves are present at the time of clearance.

In instances where specimen trees are on or near the clearance area works should aim to go around these trees where possible. If this is not possible trees should be pruned to allow track clearance while maintaining tree growth. Pruning with hand tools would be necessary, as removal of branches with diggers or other machinery can cause cracking in branches, leading to subsequent rot and tree death.

To help mitigate the losses of overall tree numbers, saplings found along the clearance route should be carefully lifted and transplanted into areas of low tree cover. This will help offset the overall loss of trees and help create greater woodland cover. To prevent losses of biodiversity associated with tree clearance, cut logs from removed trees should be left along the embankments locally, to support communities of detritivores (worms, millipedes, wood lice and other invertebrates), fungi and lichen species.

12.4.4 Scrub

Scrub was a common habitat feature of the eGreenway route. Areas of scrub containing thickets of Hawthorn, Blackthorn as well as Bramble, Bracken and Gorse are of high importance for nesting foraging and resting by birds and mammals and is associated with a rich invertebrate community. Care should also be taken to maintain areas of this habitat along the route. Scrub also protects young trees like Oaks and Ash that may eventually

become forest champions. Where possible the track should go around areas of Scrub. If this is not feasible Scrub should be cleared under the supervision of an ecologist.

12.4.5 Open grassland areas

Some areas of open grassland offer high potential for biodiversity, particularly pollinating species including moths, butterflies and bees. However, most areas of dry grassland found within the study area were of low ecological significance as they were dominated by aggressive growing course grasses that have crowded out most herb species with the exception of those that climb like Vetches or are on long stalks like Knapweed. Impacts to grasslands is considered *minor adverse.*

Areas of wet grassland however recorded significant species diversity with over 15 species recorded within a small area not uncommon. These areas should be preferentially protected where possible.

Pollinators require pollen from a diverse species range of plants including trees, shrubs and smaller plants. Pollinators such as butterflies require foods to satisfy both their caterpillar and butterfly lifecycle, while all pollinators require foraging and resting habitat. The use of native species meadow seed mixes would be ideal for landscaping where grassland is planned to be maintained. Grasslands could also be left in their current state and the natural vegetation present in the seed base would establish itself over time following mowing. A mowing plan could be developed as part of the landscape masterplan to ensure local areas for foraging, resting and hibernating are maintained for pollinating species. The All-Ireland Pollinator Plan gives good guidance for such initiatives. The ESB has signed up as a key partner of the 2012-2025 All-Ireland Pollinator Plan and grassland areas within the curtilage of ESB lands may be selected for pollinator-friendly management actions.

12.5 Invasive Species

Ireland is a signatory to a number of international treaties and conventions, including the Convention on Biological Diversity. Such treaties and conventions require the Irish Government to address issues of invasive alien species. This has been implemented through national legislation via the Wildlife Acts 1976 and 2000 (as amended) and further regulated through the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477).

Articles 49 and 50 of these latter regulations sets out the legal implications associated with alien invasive species and Schedule 3 of the regulations lists non-native species subject to the restrictions of Articles 49 and 50.

Under Article 49 and 50 of these Regulations it is an offence to:

- Plant, disperse, allow dispersal or cause the spread of invasive species.
- Keep the plants in possession for the purpose of sale, breeding, reproduction, propagation, distribution, introduction or release.
- Keep anything from which the plant can be reproduced, or propagated from, without a granted licence.
- Keep any vector material - including infested soil, seeds or plant fragments from a contaminated site, for the purposes of breeding, distribution, introduction or release.

It is important to note that if an invasive species, listed in Schedule 3 of the 2011 Regulations, has been positively identified on a works site it is not an option to do nothing i.e. action of some form must be taken to address the invasive species in order to comply with environmental legislation the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477).

A number of locations have been identified where invasive species listed in Schedule 3 have been positivity identified. Of most significance are stands of Knotweed such as

Japanese Knotweed (*Fallopia japonica*), Giant Knotweed (*Fallopia sachalinensis*) and Himalayan Knotweed (*Persicaria wallichii*). Mitigation measures are the same for all knotweed species.

The location and extent of these stands can be seen in Appendix A (Maps) and Appendix B (constraints).

12.5.1 Impacts from Invasive Species

Impacts from invasive species within the Greenway Corridor is considered *minor adverse.*

The Knotweeds: The impacts of these three species of Knotweed on the proposed clearance works and on the ongoing maintenance and management of the Greenway is owing to its highly competitive nature; Knotweed produces a dense canopy and prolific root system. If left untreated it can outcompete many native species and come to dominate habitats. Knotweeds can produce seeds however the NIEA and the NBCD note that the seeds of Japanese Knotweed (JKW) are mostly unviable, this species spreads predominately through rhizomes and vegetative growth. Fallopia x bohemica, Giant Knotweed (*Fallopia sachalensis*) produce variable amounts of pollen of variable viability. Rhizomes and seeds can easily become stuck to shoes or in the hair of animal, allowing the species to easily spread. Moving soil material containing plant material and partially rhizomes is the most likely strategy for the spread of the stand. The stands of Japanese and Giant Knotweed recorded here are associated with the dumping of soil and construction/demolition material. This is an important consideration within the context to track construction for this greenway project.

12.5.2 Mitigation of Invasive Species

Herbicide treatment of JKW has already begun by the council but signs of re-emergence was recorded within the stand. Where possible treatments should begin during late September, and additional treatments where necessary in October and November. Further treatment in the coming years will still be required to ensure each stand is totally

eradicated. All stands of JKW should be identified on the ground with bunting and signage and an exclusion zone of at least 10 m should be implemented around the stand.

JKW can be easily spread through the transportation of material containing fragments of stems or the movement of soil containing roots or rhizomes. As such all clearance works undertaken near stands of Knotweed stands must be strictly controlled. All site operatives should be informed of the presences of Knotweed stands. Stands will be clearly marked with signage and bunting.

To ensure Knotweed is not spread through the site during clearance all machinery should be thoroughly cleaned after working in areas where Knotweed stands have been recorded. Additionally, terram sheeting (or a satisfactory substitute) covered over with gravel or mulch should be laid down along the track to allow machinery to pass over the stands. It is imperative to ensure that plant material does not become stuck in machinery tyres/tracks and spread throughout the site. Site-specific Invasive Species Management Plans should be drawn up for the removal of these species. If over tracking of knotweed is required during construction works relating to the Proposed Development specific handling measures for terram/stone upon removal will be required to be implemented by the contractor.

Other invasive species: Other invasive species were recorded on site included Butterfly Bush (*Buddleia* sp.), Snowberry(*Symphoricarpos albus*) and Himalayan Honeysuckle (*Leycesteria formosa*). None of these species are listed on Schedule 3 of articles 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477) but best practise dictates that these should be removed where possible.

Best practice permits that efforts should be made to ensure that the spread of these species is prevented. This is facilitated by ensuring minimal movement of soil containing these plant species or their seeds onsite. No extensive excavations are foreseen as part

of the Proposed Project in these areas. Backfilling of excavated areas with material from those areas would aid in the prevention of the spread of these species. An invasive species management plan should also refer to these species. Though not a legal requirement, a treatment plan for these species is advised. This would usually be prepared as part of preconstruction surveys and reporting.

12.5.3 Stand Specific Invasive Species Mitigation for Clearance Works.

The following is an outline for each area of invasive species located within or on the edge of the greenway corridor. An ecologist will have to be present during works within these areas and biosecurity measures must be followed to avoid any spreading of invasive material. The areas will be monitored during the next growing season in 2021 and any growth treated as required. This monitoring will be extended around the areas of knotweed as a precaution to check for any accidental spreading or further contamination. Herbicidal treatments should be allowed two weeks to take effect.

Japanese Knotweed and Giant Knotweed Stand

This stand was found in the Blessington section along the southern portion of the greenway route. This area sees a lot of footfall from walkers and people launching boats and kayaks into the water. This stand was approximately 40m x 10m and composed both above knotweed species. The Japanese Knotweed (*Fallopia japonica*) stand has shown signs of previous treatment but was remerging. Further treatment and possibly removal is required.

Himalayan Knotweed (*Persicaria wallichii*) was recorded growing out from within the treeline on the north of the Kilbride Road on the north side of Knockieran Bridge. This small stand was mainly behind the fence line within the adjoining property and looked to sparsely cover an area of 10 x 4 metres with the majority of the stand being on private lands.

12.6 Amphibians and Reptiles

The entire proposed route was surveyed for the presence and breeding habitats of Common Frog (*Rana temporaria*), Smooth Newt (*Lissotriton vulgaris*) and Common (or Viviparous) Lizard (*Zootoca vivipara*). Much suitable feeding habitat for the Common Frog occurs within the survey area, including grassland, woodland and scrub. Breeding habitats for this species included pools, drainage ditches (particularly on field margins) and wet grassland and marsh areas. A more limited habitat for Smooth Newts was found but there is still significant habitat area for this species over the proposed route area. Suitable habitat for the Common Lizard exists in the tussocky fallow grassland and shingle and stone shoreline areas. One Common Lizard was recorded in such grassland within the Lacken route section.

12.6.1 Potential Impacts on Amphibians and Reptiles

Impacts on these species' groups might arise from habitat loss. Specifically, the loss of feeding areas and breeding habitats may be predicted. However, these habitats are common and widespread within the area under study and no significant loss of habitat is predicted. *Minor* adverse impacts are therefore predicted without mitigation measures applied.

12.6.2 Mitigation of Potential Impacts on Amphibians and Reptiles

The primary means of mitigation for these species' groups will be by avoidance. Works will avoid all suitable breeding habitats for amphibious species (e.g. pools, wet ditches and wet grasslands). The timing of works will also be important in mitigating potential impacts. No areas of still water – including seasonal pools – shall be entered between December and May, unless inspected by an ecologist and cleared to do so. Clearance of feeding and other refuge areas such as fallow grasslands is to be minimised. Over-wintering habitat areas such as log-piles or fallen trees are not to be cleared during winter months unless cleared by the onsite ecologist. Compensatory refugia may readily be created within or on the edge of woodland areas by the piling up of fallen/felled trees or

limbs. On the installation of bridges, culverts and boardwalks, as much intact vegetation should be retained as possible to maintain habitat areas for these species.

12.7 Otters

A number of signs of Otters, including spraint, feeding remains and potential holt sites were recorded during this survey. Most evidence was found along the shoreline with a significant amount of activity recorded along the Lacken section. This however may be due to the track following the shoreline more closely on that section than the others. Otters have been previously recorded within the study area[1] and are likely active within the reservoir and feeding in streams and rivers. Potential impacts to Otters as a result of the Proposed Development construction are considered *minor adverse.*

The location and further details of evidence of Otters can be seen in Appendix A and B.

Otters, along with their breeding and resting places, are protected under the provisions of the Wildlife Act, 1976, as amended by the Wildlife (Amendment) Act, 2000. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Directive, which is transposed into Irish law in the European Communities (Natural Habitats) Regulations (S.I. 94 of 1997), as amended.

Otters are also listed as requiring strict protection in Appendix II of the Berne Convention on the Conservation of European Wildlife and Natural Habitats and are included in the Convention on International Trade of Endangered Species (CITES). As such, if any signs of Otters are found during clearing or track construction mitigation measures outlined below should still be applied.

[1] https://maps.biodiversityireland.ie/Map/Terrestrial/Species/119290

12.7.1 Impacts to Otters

The clearance of shoreline and bankside vegetation and habitat can have negative impacts on Otters. In the short-term, this could result in an immediate impact of moderate to high significance on populations in these areas. However, these impacts are not likely as no major works are likely to take place on the shoreline or the banks of any of the river crossings. There is potential that works will occur within 5 m of the shoreline at some locations.

No major changes to the course of any rivers or the removal of any drains, culverts or river channels are predicted at this time meaning impacts to Otters are unlikely to be significant in the long-term. Culverts where required should be installed as box culverts to allow easy passage for Otter and other mammals like Badgers. Any such works on rivers within the study areas will require consultation with Inland Fisheries Ireland.

For new culverts or river crossings it is important that they adequately designed to allow for the free passage of Otters. Any instream works will require liaising with Inland Fisheries Ireland, and planned works near areas of Otter activity would require notification of the National Parks and Wildlife Service.

12.7.2 Mitigation of Impacts upon Otter populations

Mitigation measures are adapted from the NRA guidelines on Otter protection (2005).
Working hours should avoid dawn and dusk in order to avoid noise disturbance. The route design should take into account areas of high Otter activity and avoid sensitive areas insofar as possible. Screening of works areas to minimise disturbance may be recommended.

The impacts on Otter populations may also be mitigated against by the provision of constructed measures as necessary. These include underpasses and culverts positioned and designed to allow Otter access at different flow conditions.

Mitigation measures should be proactive in ensuring that any works that may interact with Otters feeding resting or movement does not inhibit their natural function. Further surveys are required to conclusively determine whether possible Otter holts recorded during this survey are in use before mitigation measures can be fully created.

Any additional culverts or bridges should be designed to allow Otter and Badger access by providing a 600mm pipe or a ledge. This access should be above normal flood levels. The necessity for such built measures will be determined following further survey work and consultation with an appropriately experienced ecologist.

12.8 Birds

The Birds Directive (2009/147/EC) and the Habitats Directive (92/43/EEC) provide legal protection for all bird species, selected habitats and the wider environment in the EU. The Wildlife Act 1976 (Revised, Updated to 20 December 2018) infers in Section 22, (5), that it is an offence for a person to intentionally kill or to injure a protected wild bird or to intentionally to destroy, injure or mutilate the eggs or nest of a protected wild bird.

A bird survey was undertaken as part of this investigation, with species encountered during habitat surveying being recorded in Appendix B. Birds associated with scrub, deciduous and coniferous woodland are noted. Species included, among others, a number of both resident and migratory species. Species among others, included tit, finch, warbler, thrush, corvid, hirundine, and raptor species. Numerous species associated with the lake and shore habitat were also identified. It was acknowledged that some species would not have been recorded during route surveying in August 2020. Therefore, a review of existing literature on bird usage of Poulaphouca reservoir and the surrounding area was also conducted.

A review was conducted to identify other species, not recorded by Flynn Furney Environmental Consultants. This review analysed existing available documentation from NPWS SPA information, Irish Wetland Bird Survey (IWeBS) data (2006-2020), data from the Ireland Rare Bird Committee (reports 2013-2018), BirdWatch Ireland publications (Wings Spring Edition, 2016) and Lewis et al. (2019). Species habitat association data was obtained from existing literature (Nairn and O'Halloran, 2012; Keating et al. 2016).

12.8.1 Birds associated with woodland and scrub

The species highlighted in Appendix B, noted as having associations with woodland and scrub are primarily resident and migratory breeding species. These species are likely to primarily use the route and surrounding vegetation for nesting and foraging, while using adjacent agricultural areas and the lake shore also.

12.8.2 Aerial-feeders

The aerial feeders encompassing Swift, Swallow, Sand Martin and House Martin are also breeding species, with the latter associated with sand cliffs along the lakeshore. Indeed, a Sand Martin colony was noted in Russborough. Swift, Swallow and Sand Martin are typically associated with buildings. These aerial feeders are likely to forage over the lake, the forest and open areas along the proposed Greenway route, and in adjacent fields.

12.8.3 Birds associated with rivers & streams

Rivers within the survey area are also likely to support Kingfisher which is listed on Annex I of the EU Birds Directive, as well as other aquatic species such as Dipper (*Cinclus cinclus*) and Grey Wagtail; the latter is now on the red list of Birds of Conservation Concern (Gillian et al (2021). Some of these species have been recorded during surveys but may occur along a number of the water courses that feed into the reservoir. Minor works near water courses are expected to occur, including installing of crossings and culverts. Any culverts that require box culvert installation should be assessed in terms of the impact that this installation may have on birds dependent on fresh watercourses.

12.8.4 Birds associated with the reservoir and shore

Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC are listed in this section. The qualifying interests of the SPA include the over-wintering Greylag Goose and Lesser Black-Backed Gull. The Site is of national importance for the wintering population of Greylag Geese, which is one of the largest in the country (Lewis et al, 2019). The Site provides the main roost for these birds. The Greylag Geese spend a high proportion of time foraging in adjacent fields and agricultural areas surrounding the reservoir. The reservoir attracts roosting gulls during winter, most notably a large population of Lesser black-backed gull, which are rare in winter in Ireland, away from the south coast. It was noted from recent data that numbers of Lesser Black-backed Gull have fallen in recent years (iWeBS, 2021). Other species include Common Gull, Black Headed Gull, Curlew, Cormorant, Great-Crested Grebe. A range of other waterfowl species listed in Annex II occur in relatively low numbers, including Whooper Swan, Wigeon and Goldeneye. The gulls, waders, rails, ducks, geese and grebes primarily use the lake and shore habitat with some exceptions.

12.8.5 Impacts

It is plausible that works outside of the breeding season, associated with tree clearance, mulching, chainsaw activities, movement of track machines and other vehicles, excavation works, and other human activities will cause a level of noise, vibration and visual disturbance to birds. Special care is required at watercourses to ensure no pollution.

Impacts on birds associated with woodland and scrub

The loss of woody vegetation, scrub and some areas of woodland is likely to have some impact upon the bird species listed above. However, given the availability of suitable cover within the surrounding area, any impacts are likely to be minor, provided the footprint of the works is kept to a minimum, and provided works take place outside of the bird nesting season.

Impacts on birds associated with lake and shore habitat

It is widely accepted that numerous ducks, geese, grebes, gulls and waders can be adversely affected by human activities. Some of these bird species are prone to being easily disturbed, with such disturbance potentially impacting on their fitness, and reproductive success (if disturbance occurs during the breeding season). Some of these species, that occur at the reservoir are breeding species. These species would largely be unaffected by works, as these species typically show a high level of habituation to human activities e.g. Cormorant, Mallard, Mute Swan, Wigeon, Little Grebe, Great-crested Grebe. Some wintering species and passage migrants associated with the lake and shore area could be potentially affected by disturbance associated with the works activities, or the use of the route when it becomes operational. However, numbers utilising the Greenway are likely to be lowest during winter months.

12.8.6 Mitigation

Mitigation for birds associated with woodland and scrub

Given the dense terrain and difficulty associated with surveying scrub vegetation for nesting birds, it is advised for all clearance works to be conducted outside of the bird breeding season (March to September). Minor clearance, though discouraged, could be permitted if small patches due to be cleared, were surveyed by experienced bird surveyors, during the bird nesting season. Local area clearance should be conducted within 24 hours of bird surveys during the breeding season if no active nests were identified. These surveys could be done for essential works, and the surveys would identify whether any nesting is occurring and whether such nesting interferes with planned works.

Disturbance caused to woodland and scrub associated birds will include a loss of available habitat, where the footprint of works takes place. Therefore, best efforts to retain habitat, and trees, where possible, and minimise disturbance, should be made. Installation of nest boxes tailored for different species should be considered as a form of compensatory

mitigation for some of these species. Landscaping or planting of a compensation area would also have a beneficial impact on some of these species, particularly if planting occurred in areas of improved grassland. Efforts to plant salvaged saplings are likely to positively influence some of these species in the longer term. Species would benefit most from planting of native varieties of plants. Nest box installation and placement should form part of the landscape masterplan. Some short-term impacts may occur to these bird species listed above relating to increased noise and disturbance caused by the track clearance and path construction, and unnecessary noise and disturbance should be minimised.

Mitigation for species associated with rivers and streams

The ecologist should be notified regarding works within and around watercourses and culverts. All works affecting watercourses should be agreed upon with Inland Fisheries Ireland prior to works. These works have the potential to affect fish migration, if not installed adequately, with consequences on upstream fish abundance, and hence, prey abundance for piscivorous birds. These works also have the potential to cause pollution to freshwater habitat, through silt generation, concrete contamination or hydrocarbon or chemical spillages.

Mitigation for aerial feeders

Care should be taken to prevent disturbance to nesting areas of aerial feeders. As works will be taking place outside of the breeding season, there will be no immediate effect on these birds. The Sand Marten colony should be avoided, and efforts should be made to ensure works do not affect the sand cliff where this colony exists. The path should be directed so that it does not pass in immediate proximity to this colony.

Mitigation measures for lake and shore species

Care should be taken to retain shoreline vegetation, as this acts as a visual screen that prevents noise and visual disturbance to birds utilizing the reservoir. The disturbance

potential for these birds is highest when roosting and foraging areas were affected. Therefore, care should be taken to ensure that all these areas are identified, and disturbance of these areas is prevented.

Works activities should not occur over the wintering period within one hour after dawn, and one hour before dusk. Regular roost monitoring should be undertaken when works are within 1km of identified roost areas, to ensure works are not having a negative impact on roosting birds.

Areas of high foraging intensity of Greylag Geese should also be identified, and these flocks should be monitored regularly to ensure works are not having an adverse effect on bird foraging behaviour. If impacts on roosting or foraging behaviour are identified, possible additional mitigation measures may be required, including screening works with a barrier to assist in noise transmission, and reducing works hours.

12.8.7 Construction Specific Mitigation

Impacts to water quality

- A Construction Environmental Management Plan (CEMP) is to be drawn prior to the commencement of any works.
- Works crossing watercourses are to be carried out as per guidelines given by TII (2009) and by Inland Fisheries Ireland (2016).
- Good site practices as described by CIRIA (2006) are to be followed for all site works.
- Area of works is to be limited, working areas around watercourses are to be strictly delineated.
- Designated storage areas for soils and any other stockpiles are to be created away from all watercourses and the reservoir shoreline.
- Silt fencing shall be maintained adjacent any areas where silt may run off from site/area of works.
- Prior to commencement of works in any water-sensitive area, a Toolbox Talk for all site staff shall be held. All site staff shall be aware of the significance of this working area.

- A member of site staff shall be given responsibility for overseeing good works practices.
- Works shall not take place during or immediately following periods of heavy rainfall.
- Capacity to remove materials from a working area in the event of flooding shall be maintained.
- Fuel and lubricants shall be stored in designated areas away from watercourses and the shoreline.
- Spill-kits including booms and soak-pads are to be maintained on site.

Impacts due to noise or disturbance related to construction activities

- Timing of works is to avoid November-January. This schedule may be agreed with Wicklow County Council in conjunction with NPWS and Birdwatch Ireland prior to commencement.
- Pre-construction surveys to be carried out prior to the commencement of works to identify sensitive areas for these species in the vicinity of the works areas.
- Areas requiring rock armour are to be surveyed by a suitably qualified ecologist prior to works. Following agreement that no sensitive species will be affected, these works will be allowed to proceed under ecologist supervision. If significant disturbance a protected species is noted, works practices for rock armouring shall be reviewed in consultation with the above bodies.
- Monitoring of works and the target (QI) species is to be carried out during first six weeks of works in order to record any impacts on these species. If significant disturbance to these species is noted, works practices shall be reviewed in consultation with the above bodies.
- Works are to avoid shoreline areas insofar as possible. Plant or machinery use will be limited in this area. Personnel are to limit their use of shoreline areas.
- Time and duration of works operations shall be limited. Working hours shall avoid dawn & dusk.
- Noisy operations will be kept limited and scheduled for close to noon as possible.
- Plant/machinery will be shut off when not in use.

12.8.8 Operational Phase Mitigation

The operational phase may pose some risks to these birds whereby use of the shoreline by pedestrians, campers, and dogs, could potentially cause disturbance to roosting overwintering birds. Therefore policies, including dog control, areas of reduced access,

surrounding sensitive roost areas and educational bird disturbance minimisation education campaigns should be considered.

12.8.9 Clearance During the Nesting Season

Best practice requires that bird surveys are conducted during the breeding season from the beginning of March to the end of August to assess works areas for breeding birds if essential works needed to be undertaken. The presence of nesting birds can result in stoppage of works in the vicinity of nesting birds, until chicks have fledged identified nests. The buffer zones used to prevent nesting bird disturbance is often species specific, with rarer species, and species with low levels of habituation to human activities, generally being given larger buffer areas.

12.9 Red Squirrel

Evidence of Red Squirrel feeding and possible caches and dreys were recorded throughout the survey area. Red Squirrel feeding was evidenced by particularly or fully eaten pinecones and hazel nuts found on the ground but often found at prominent locations like on top of tree stumps, on fallen trees or on mossy banks. Evidence was generally recorded within areas of coniferous woodland with most evidence recorded in areas of Scots Pine. However, evidence of feeding on Sitka Spruce pinecones was also common.

A number of possible dreys were recorded throughout the survey area. These were noted as piles of sticks and leaf material within the forks of a tree or high on a trees canopy. To determine whether these are in fact dreys, detailed assessment will be required.

Red Squirrels were until recently rare in Ireland. This was mostly due to the prevalence of the non-native Grey Squirrel. It is believed that the resurgence in Pine Marten, which is known to predate the Grey Squirrel has aided the return of the Red Squirrel. The reduction in Grey Squirrels has also lessened the disease pressure of Squirrel Pox which was one of the main drivers in the Red Squirrels decline. The NPWS carried out an All-

Ireland Squirrel and Pine Marten Survey 2019, the survey suggests that Red Squirrel sightings have increased and the squirrel has returned to parts of the midlands from which it had disappeared. It also noted a negative correlation between the Grey Squirrel and Pine Marten, with fewer Grey Squirrel where the Pine Marten has increased most significantly (Lawton et al. 2020). The red squirrel is protected in the under the Irish Wildlife Act (1976) and Wildlife (Amendment) Act (2000), and the Bern Convention Appendix III.

12.9.1 Impacts on Red Squirrels

Minor adverse impacts to Red Squirrel feeding and navigational opportunities may incur as a result of the proposed clearance works and subsequent Greenway operation. Operatives and site management with responsibility for clearance of the Greenway path must ensure that the removal of trees does not impact upon Red Squirrel nesting particularly during winter months when food is scarcer and they are likely to be more sensitive to disturbance. Overall, the removal of trees to path construction is not considered to be a likely cause of impact on Red Squirrels as the Site has an abundance of food sources (nutting trees) relative to the size of the corridor being cleared.

It is not considered likely that the operation of the Proposed Project will cause any significant disturbance of this species. Red squirrels are a common sight in city parks around mainland Europe and are comfortable with the presence of humans. It is recommended however that signage is erected to remind people not to put out food for or try to feed Red squirrels.

12.9.2 Mitigation for Red Squirrels

Before clearance works begin, the entire route should be walked and all trees that will require removal should be marked. An ecologist should be present for this. Binoculars should be used to look into the canopy of each trees designated for removal to ensure firstly that it does not contain a drey or any significant holes that might provide nesting opportunities for Red Squirrel, Pine Marten or Bats. Only once this has been confirmed

should these trees be allowed to be removed. If a drey is recorded within a tree works should aim to avoid this tree or if that is not possible seek a derogation licence from NPWS. If possible caches are discovered these should be noted and avoided where possible as they are critical to helping local populations survive the winter months. Red Squirrels are also venerable to disturbance during the mating and breeding season which begins as early as January and may run into late summer. Artificial dreys could also be created to help population particularly during the initial construction phase of this project.

12.10 Pine Marten

Similarly to the Red Squirrel discussed in the previous section, Pine Martens were, up until recently, a rare occurrence within the woodlands of Ireland but have made a resurgence in recent years. Evidence of Pine Marten was widespread in the survey area with scats found in every section of the Greenway route. A Pine Marten was also sighted at the southern extent of the Valleymount Section.

The Pine Marten is protected in Ireland by national and international legislation under the Irish Wildlife Act (1976) and Wildlife (Amendment) Act (2000). The European Union's Habitats and Species Directive further obliges Ireland to maintain the favourable conservation status of the Pine Marten throughout its range. The dominance of conifer woodland interspersed with areas of deciduous woodland and wet woodland within the study area provides optimal habitat conditions for Pine Martens.

12.10.1 Impacts on Pine Marten

Overall impacts upon Pine Marten population are considered *minor adverse*. As with the Red Squirrel, impacts to Pine Martens as a result of the Proposed Development are mainly associated with the loss of trees and disturbance during the construction phase of the Proposed Development. Operatives and site management with responsibility for clearance of the Greenway path must ensure that the removal of trees does not impact upon Pine Marten nests. Overall, the removal of trees to path construction is not

considered to be a likely cause of impact on Pine Martens as site clearance is not considered likely to impact upon the overall food or nesting resource for this species as most trees are to be retained.

It is not considered likely that the operation of the Proposed Development will cause any significant disturbance of this species. Pine Martens are primarily nocturnal but are often seen during the day during summer months. As the Proposed Development is not intended for night-time use, the likely impact upon the normal function of this species are limited.

A reduction in trees is also not considered to be a likely significant impact upon the species as the removal of trees to allow the track to be installed is not significant given the degree of tree cover within the boundary of the Site.

12.10.2 Mitigation for Pine Marten

Before clearance works begins the entire route should be walked and all trees that will require removal should be marked. A qualified and competent Ecologist should be present for this. Binoculars should be used to look into the canopy of each trees designated for removal to ensure firstly that it does not contain a nest or a significant hole that might provide nesting opportunities for Pine Martens. Only once this has been confirmed should these trees be allowed to be removed. If a possible nest or suitable hole is recorded within a tree, works should aim to avoid this tree or if that is not possible seek a derogation licence from NPWS. The list of mature trees seen in Appendix B will also provide a good reference for suitable nesting holes.

Artificial nest boxes could also be created to help mitigate any potential loss of nesting sites.

13 CONCLUSION

Ecological surveys were carried out within the proposed route of the Blessington eGreenway. These were completed within optimal time for habitat and botanical assessment of the route and adjacent areas. Surveys included mammal, bird, bat habitat and invasive species. An extensive desktop survey was carried out which used available data from suitable sources which included online databases (e.g. NPWS and National Biodiversity Data Centre) and previous surveys (e.g. The NSNW). Consultation was carried out with statutory bodies such as NPWS, Wicklow County Council and Inland Fisheries Ireland. The ESB owns almost all of the lands in which the Greenway is proposed; therefore, their Fisheries Section was also consulted. Non-governmental organisations that were consulted included Birdwatch Ireland and the Irish Wildlife Trust.

A wide range of habitats was recorded during survey period. These ranged from wetland habitats such as reservoir, wet grassland and depositing rivers to woodland, scrub and built areas. The reservoir is essentially an artificial habitat with evidence of much modification on the shoreline areas. These included extensive areas of rock armour and large conifer plantations. No habitats listed on Annex I of the EU Habitats Directive were found within the survey area. No plants subject to the Flora Protection Order (2015) were found to occur within the area surveyed.

Twenty-four areas were described in the habitat survey as ESAs, being of greater sensitivity due to the habitats or species occurring here. These included wetland areas, mixed broadleaved woodland and areas containing refugia of protected mammal species.

Four protected mammal species were found to occur within the area. These were Otter, Badger, Pine Marten and Red Squirrel. Habitat areas suitable for these species were noted. Their refugia, where found, were recorded to ensure that these will not be impacted upon.

A survey of bat habitat over the route found relatively few potential bat roost habitat areas. This is partly due to the scarcity of buildings within the area under survey but also the species of trees here (mostly conifers) and the scarcity of mature trees. A number of measures have been described to mitigate against any impacts on bat populations while any tree-felling or clearance is being carried out.

Surveys also included a record of any large, older or veteran trees. There were few in the survey area. Most trees surveyed were between 30-50 years old. Some older trees and treelines were recorded. Protection measures for these have been described.

A targeted survey for invasive species was carried out. Numerous non-native plant species were recorded, of which three are listed in EU legislation as requiring control. All of these are species of Knotweed. Management strategies for these have been outlined. However, the local authority, in conjunction with the relevant landowners where applicable will need to develop these further. The remaining non-native invasive species are not listed in the above legislation but best practice management of these is recommended.

All birds seen and heard during surveys were recorded. The greater majority of these were species typical of farmland, woodland and hedgerows. Exceptions to this would be the wetland specialists and gulls. Most of the birds recorded are of lower conservation concern but exceptions to this included Lapwing and Black-headed Gull (birds of highest conservation concern).

An evaluation of habitats showed that Poulaphouca Reservoir SPA was the only site within the survey area being of *International* importance. Impacts to this designated site were described as negligible in significance given the location and nature of works and of only *unlikely* likelihood. All of the other sites were of *high, moderate or low local* importance. Reference was made to some of the less important habitat types having a role in providing habitat for protected species (e.g. coniferous or mixed plantations and Red Squirrels).

Impacts of *minor* adverse significance are predicted for most of the habitat areas to be impacted upon by the Proposed Development.

A detailed series of mitigation measures has been drawn up to address the potential impacts. These include the limiting of works areas, protection of more mature trees and the timing of works. The predicted loss of trees is to be mitigated by an extensive planting programme alongside the route and outside the proposed route area. In addition to this, areas of conifer plantation that have been affected by wind-throw are to be replanted by WCC with native tree species. The above measures will result in a significant increase in tree cover overall. The drawing up of a CEMP is recommended for the construction phase of the project.

In addition to these, a wide range of measures have been described which will enhance existing habitats. For example, the planting of native trees to benefit birds and other species; the planting of food plants for a protected butterfly species; and the management of grassland areas for the benefit of pollinators. This range of measures, suitably implemented, should result in an overall increase in the diversity of habitats and species along the Proposed Development route.

14 REFERENCES

CIEEM (2018). The Chartered Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment in the UK and Ireland: terrestrial, freshwater and Coastal 2nd Edition.

Curtis, T.G.F. and MacGough, H.N., 1988. *The Irish red data book.* Wildlife Service Ireland.

EPA (2015a). The EPA's Advice Notes on Preparing Environmental Impact Statements Draft.

EPA (2015b). The EPA's Draft Revised Guidelines on Information to be Contained in Environmental Impact Statements.

European Commission (2007) Interpretation manual of European Union habitats – EUR27.

Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. The Heritage Council, Kilkenny.

Gilbert, Gillian, Andrew Stanbury, and Lesley Lewis. "Birds of Conservation Concern in Ireland 4: 2020–2026." Irish Birds 43 (2021): 1-22.

Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009).

iWeBS (2021) Data from the Irish Wetland Bird Survey from counts on Poulaphouca Reservoir 2016-2020. Supplied to authors by Birdwatch Ireland, December 2021.

Joint Nature Conservation Committee's (JNCC) Handbook for Phase 1 Habitat Survey – a technique for environmental audit (JNCC, 2010).

Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Lawton C., Hanniffy, R., Molloy, V., Guilfoyle, C., Stinson, M. & Reilly, E. (2020). All-Ireland Squirrel and Pine Marten Survey 2019. Irish Wildlife Manuals, No. 121. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

Lewis, L. J., Burke, B., Fitzgerald, N., Tierney, T. D. & Kelly, S. (2019) Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16. Irish Wildlife Manuals, No. 106. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

Lysaght, L. and Marnell, F. (Eds) (2016) Atlas of Mammals in Ireland 2010 – 2015, National Biodiversity Data Centre, Waterford.

National Roads Authority (2009). Guidelines For The Assessment Of Ecological Impacts Of National Road Schemes. NRA, Dublin.

National Roads Authority (2006). Guidelines for the Treatment of Badgers Prior to the Construction of National Roads Schemes. NRA, Dublin.

National Roads Authority (2005). Guidelines for the Treatment of Bats Prior to the Construction of National Roads Schemes. NRA, Dublin

National Roads Authority (2005b). Guidelines for the Protection and Preservation of Trees, Hedgerows, Scrub prior to, during and post Construction of National Road Schemes. NRA, Dublin.

National Roads Authority (2006). Best Practice Guidelines for the Conservation of Bats in the Planning of National Roads Schemes. NRA, Dublin

National Roads Authority (2006b). Best Practice Guidelines for the Crossing of Watercourses during the Construction of National Roads Schemes. NRA, Dublin

National Roads Authority (2006c) Guidelines on the Treatment of Otters Prior to the Construction of National Road Schemes, NRA, Dublin.

National Roads Authority (2008). Guidelines on the Management of Noxious Weeds and Non-native Invasive Species on National Roads, NRA, Dublin

Smith, G. F., O'Donoghue, P., O'Hora, K., & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council, Kilkenny.

Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016). Ireland Red List No. 10: Vascular Plants. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

APPENDIX A: Habitat and Ecological Constraint Mapping

Appendix A1: Ecological Constraints

Appendix A1.1: Ballyknockan Section

Appendix A1.2: Baltyboys Section

Appendix A1.3: Blessington Section

Appendix A1.4: Lacken Section

Appendix A1.5: Tulfarris Section

Appendix A1.6: Valleymount Section

Appendix A2: Habitat Maps Section

Appendix A2.1: Ballyknockan Section

Appendix A2.2: Baltyboys Section

Appendix A2.3: Blessington Section

Appendix A2.4: Lacken Section

Appendix A2.5: Tulfarris Section

Appendix A2.6: Valleymount Section

APPENDIX B: Constraints Tables

Appendix B.1:Badgers

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
9	701209.3	708339	Badger latrine		Ballyknockan	Usna K and Sean M	Notes
10	700397.1	707739.3	Badger potential area		Ballyknockan	Usna K and Sean M	Notes
11	701113.5	708136	Badger scat		Ballyknockan	Usna K and Sean M	Notes
13	701320.8	710500.7	Badger scat		Ballyknockan	Usna K and Sean M	Notes
14	701815.5	709909.5	Badger scat		Ballyknockan	Usna K and Sean M	Notes
15	701570.8	708647.8	Badger scat		Ballyknockan	Usna K and Sean M	Notes
1	698194.1	708963.6	Badger prints		Baltyboys	Billy F & Chris	Notes
17	698307	711962.3	Potential burrow	Requires additional survey	Baltyboys	Billy F & Chris	To be protected
21	698933	710000	Badger Sett		Baltyboys	Billy F & Chris	To be retained where possible
12	695810.9	710351.6	Badger scat		Blessington	Usna K and Sean M	Notes

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
16	698769.8	712296.1	Badger latrine		Tulfarris	Usna K and Sean M	Notes
20	697228	709625.7	Possible Sett (Abandoned)		Tulfarris	Usna K and Sean M	To be protected
2	698986.6	706728.6	Badger digging		Valleymount	Ian D & Eanna ni L	Notes
3	699576.7	706392.4	Badger prints		Valleymount	Ian D & Eanna ni L	Notes
4	698781.4	707595.2	Badger scat		Valleymount	Ian D & Eanna ni L	Notes
5	698858.6	707544.6	Badger scat		Valleymount	Ian D & Eanna ni L	Notes
6	698577.1	707991.3	Badger scratching		Valleymount	Ian D & Eanna ni L	Notes
7	698481.8	708128.7	Badger scratching		Valleymount	Ian D & Eanna ni L	Notes
8	698954	707502	Badger skull		Valleymount	Ian D & Eanna ni L	Notes
18	698775.1	707585.2	Abandoned sett	Requires additional survey	Valleymount	Ian D & Eanna ni L	To be protected
19	700217	707119.8	Badger Sett	Requires additional survey	Valleymount	Ian D & Eanna ni L	To be protected

Appendix B.2:Bats

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
1	695316.4	709773.1	Bat Potential		Blessington	Usna K and Sean M	To be protected
2	695949.4	710498.2	Tunnel with low bat potential	Arches damp, recent rehab works	Blessington	Usna K and Sean M	To be protected

Note: Mature Trees Particularly Beech, Ash and Oak are also recorded for their Bat potential

Appendix B.3:Birds

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
1	698712.897	707660.211	Possible Wood Peckers activity		Valleymount	Ian D & Eanna ni L	Notes
2	698980.517	707013.049	Rookery		Valleymount	Ian D & Eanna ni L	To be protected
3	695349.4543	709773.0857	Rookery		Blessington	Usna K and Sean M	To be protected
4	695704.8705	709991.1421	Sand bank		Blessington	Usna K and Sean M	To be protected
5	695378.6621	709834.0046	Sand Marten nesting colony		Blessington	Usna K and Sean M	To be protected
1	698712.897	707660.211	Possible Wood Peckers activity		Valleymount	Ian D & Eanna ni L	Notes
2	698980.517	707013.049	Rookery		Valleymount	Ian D & Eanna ni L	To be protected
3	695349.4543	709773.0857	Rookery		Blessington	Usna K and Sean M	To be protected
4	695704.8705	709991.1421	Sand bank		Blessington	Usna K and Sean M	To be protected

Appendix B.4: Habitats

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
1	700371.1	707439.7	Old Stone Walls		Ballyknockan	Usna K and Sean M	To be protected
2	701873.5	709543.9	Dense Scrub		Ballyknockan	Ian D & Eanna ni L	Clear Under Supervision
3	701612.3	710343.8	Dense Scrub		Ballyknockan	Usna K and Sean M	Clear Under Supervision
4	701213	710495.5	Dense Scrub		Ballyknockan	Usna K and Sean M	Clear Under Supervision
5	701375.2	710423.2	Dense Scrub		Ballyknockan	Usna K and Sean M	Clear Under Supervision
6	701836.2	709627.5	Dense Scrub		Ballyknockan	Usna K and Sean M	Clear Under Supervision
7	701871.2	709394.5	Dense Scrub		Ballyknockan	Usna K and Sean M	Clear Under Supervision
8	701866.5	709046.3	Dense Scrub		Ballyknockan	Usna K and Sean M	Clear Under Supervision
9	701735.3	708842.7	Dense Scrub		Ballyknockan	Usna K and Sean M	Clear Under Supervision
10	700867.1	707966	Dense Scrub		Ballyknockan	Usna K and Sean M	Clear Under Supervision
11	700652.5	707773.4	Dense Scrub		Ballyknockan	Usna K and Sean M	Clear Under Supervision
12	701804.4	709961.9	Wind Thrown Area		Ballyknockan	Usna K and Sean M	Clear Under Supervision

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
13	701687.9	710209.9	Habitat Area Requires Botanical Survey	Requires additional survey	Ballyknockan	Usna K and Sean M	To be protected
14	701358.1	708007.5	Old Stone Walls		Ballyknockan	Usna K and Sean M	To be protected
15	701261.1	708009.1	Old Stone Walls		Ballyknockan	Usna K and Sean M	To be protected
16	701632	710334	Deciduous Trees		Ballyknockan	Usna K and Sean M	To be retained where possible
17	698728	711249.4	Potential Spring		Baltyboys	Billy F & Chris	To be protected
18	698501.9	711685.4	Spring or Stream		Baltyboys	Billy F & Chris	To be protected
19	695895	710387.2	Marsh Fritillary Area	Protected Butterfly Habitat	Blessington	Blessington	To be protected
20	700117.3	711047.5	Small watercourse	Low fisheries significance	Lacken	Billy F & Chris	To be protected
21	698681.6	713919.3	Fallen trees		Lacken	Billy F & Chris	To be removed where possible
22	697379.4	709370.4	Stone wall		Tulfarris	Ian D & Eanna ni L	To be retained where possible
23	698596.5	707670.4	CUS Area		Valleymount	Ian D & Eanna ni L	Clear Under Supervision
24	699012	707424.8	CUS Area	Dense scrub	Valleymount	Ian D & Eanna ni L	Clear Under Supervision

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
25	699013.5	707427.8	CUS Area	Dense scrub	Valleymount	Ian D & Eanna ni L	Clear Under Supervision
26	700131.6	706813.5	Scrub		Valleymount	Ian D & Eanna ni L	Clear Under Supervision
27	699636.6	706559.5	Wind Throw Area		Valleymount	Ian D & Eanna ni L	Clear Under Supervision
28	698970.6	706528.5	Diverse deciduous understory trees	Rowan, Ash, Birch and Holly in centre line of woodland	Valleymount	Ian D & Eanna ni L	To be protected
29	698953.5	706876.8	Mature deciduous woodland		Valleymount	Ian D & Eanna ni L	To be protected
30	699022.6	707283.8	Deciduous woodland		Valleymount	Usna K and Sean M	To be protected

Appendix B.5: Invasive Species

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
1	698192.2029	712011.8111	Dense Snowberry stand		Baltyboys	Billy F & Chris	To be removed where possible
2	698841.889	714532.283	Himalayan Knotweed		Blessington	Ian D & Eanna ni L	To be removed where possible
3	696547.2211	710883.0624	Giant Knotweed		Blessington	Usna K and Sean M	To be removed where possible
4	696530.0303	710895.4131	Japanese Knotweed		Blessington	Usna K and Sean M	To be removed where possible

Appendix B.6: Mammal Trails

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
1	698267.3	711983.8	Mammal trails		Baltyboys	Billy F & Chris	Notes
2	698218.1	712007.5	Mammal trails		Baltyboys	Billy F & Chris	Notes
3	698148.1	712044.4	Mammal trails		Baltyboys	Billy F & Chris	Notes
4	698678.4	707651.9	Mammal trails		Valleymount	Ian D & Eanna ni L	Notes
5	698975	706677.9	Mammal trails		Valleymount	Ian D & Eanna ni L	Notes
6	698980.8	706366.6	Mammal trails		Valleymount	Ian D & Eanna ni L	Notes
7	699739.3	706655.7	Mammal trails		Valleymount	Ian D & Eanna ni L	Notes
8	699854.7	706745.8	Mammal trails		Valleymount	Ian D & Eanna ni L	Notes
9	701254	708387.1	Mammal trails		Ballyknockan	Usna K and Sean M	Notes
10	701082.1	708138	Mammal trails		Ballyknockan	Usna K and Sean M	Notes
11	700960.6	708064.8	Mammal trails		Ballyknockan	Usna K and Sean M	Notes
12	700619.8	707759.7	Mammal trails		Ballyknockan	Usna K and Sean M	Notes
13	700393.1	707788.7	Mammal trails		Ballyknockan	Usna K and Sean M	Notes
14	700595.7	707762.3	Mammal trails		Ballyknockan	Usna K and Sean M	Notes
15	698616.8	707799.4	Mammal trails		Valleymount	Usna K and Sean M	Notes
16	701847.8	709238.6	Mammal trails		Ballyknockan	Usna K and Sean M	Notes
17	697958	708357.8	Mammal tracks		Baltyboys	Billy F & Chris	Notes

Appendix B.6: Pine Marten

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
1	699086.1	710419.6	Pine Marten activity	Baltyboys	Billy F & Chris	Notes	Notes
2	698510.9	711684.5	Pine Marten activity	Baltyboys	Billy F & Chris	Notes	Notes
3	698381.2	711892	Pine Marten activity	Baltyboys	Billy F & Chris	Notes	Notes
4	699627.4	706486.1	Pine Marten scat	Valleymount	Ian D & Eanna ni L	Notes	Notes
5	701862.2	709558.6	Pine Marten scat	Ballyknockan	Usna K and Sean M	Notes	Notes
6	701794.8	709898.5	Pine Marten scat	Ballyknockan	Usna K and Sean M	Notes	Notes
7	701794.1	709732.6	Pine Marten scat	Ballyknockan	Usna K and Sean M	Notes	Notes
8	701228	708364.4	Pine Marten scat	Ballyknockan	Usna K and Sean M	Notes	Notes
9	700872.5	707958.6	Pine Marten scat	Ballyknockan	Usna K and Sean M	Notes	Notes
10	697299.8	709676.3	Pine Marten scat	Tulfarris	Usna K and Sean M	Notes	Notes
11	699088.1	706108.7	Probable Pine Marten nest	Requires additional survey	Valleymount	Ian D & Eanna ni L	To be protected

Appendix B.7: Otter

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
1	698677.4	713153.7	Possible Picnic Area		Lacken	Billy F & Chris	Notes
2	698715.7	711273.6	Cray Fish remains		Baltyboys	Billy F & Chris	Notes
3	698722.2	711257.7	Otter activity		Baltyboys	Billy F & Chris	Notes
4	699002.8	711796.7	Otter spraint		Lacken	Billy F & Chris	Notes
5	701284	708409.8	Otter spraint		Ballyknockan	Usna K and Sean M	Notes
6	699122.2	710687.6	Otter activity	Requires additional survey	Baltyboys	Billy F & Chris	To be protected
7	698972.9	710898	Potential Otter holt	Requires additional survey	Baltyboys	Billy F & Chris	To be protected
8	699077	710779.3	Potential holt	Requires additional survey	Baltyboys	Billy F & Chris	To be retained where possible

Appendix B.8: Route

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
1	698669.8	714446.9	Very narrow footpath	with hedge	Blessington	Ian D & Eanna ni L	Notes
2	699026.8	707233.1	Bank erosion		Valleymount	Ian D & Eanna ni L	To be avoided where possible
3	699633.4	706485.9	Small Stream/Wet Ditch		Valleymount	Ian D & Eanna ni L	To be avoided where possible
4	698980.8	706313.6	Trees undermined by erosion	Willow revetment	Valleymount	Ian D & Eanna ni L	To be avoided where possible
5	698564.8	707788	Dumping		Valleymount	Ian D & Eanna ni L	To be removed where possible

Appendix B.9: Red Squirrel

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
1	698538.1	713585.2	Red Squirrel feeding evidence	Lacken	Billy F & Chris	Notes	Notes
2	698557.9	713521.9	Red Squirrel feeding evidence	Lacken	Billy F & Chris	Notes	Notes
3	698556.5	713499.2	Red Squirrel feeding evidence	Lacken	Billy F & Chris	Notes	Notes
4	698502.3	708109.8	Red Squirrel feeding evidence	Valleymount	Ian D & Eanna ni L	Notes	Notes
5	699017.5	707183.5	Red Squirrel feeding evidence	Valleymount	Ian D & Eanna ni L	Notes	Notes
6	699610.1	706435.3	Red Squirrel feeding evidence	Valleymount	Ian D & Eanna ni L	Notes	Notes
7	699910.1	706792.6	Red Squirrel feeding evidence	Valleymount	Ian D & Eanna ni L	Notes	Notes
8	699966.2	706791.7	Red Squirrel feeding evidence	Valleymount	Ian D & Eanna ni L	Notes	Notes
9	697230.3	711876.2	Red Squirrel feeding evidence	Blessington	Ian D & Eanna ni L	Notes	Notes
10	697059.5	711774.7	Red Squirrel feeding evidence	Blessington	Ian D & Eanna ni L	Notes	Notes
11	695986.8	710460.5	Red Squirrel feeding evidence	Blessington	Blessington	Notes	Notes
12	697275.3	709659.9	Red Squirrel Evidence	Tulfarris	Usna K and Sean M	Notes	Notes

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
13	698544.5	713475.7	Potential Drey	Requires additional survey	Lacken	Billy F & Chris	To be protected
14	699624.3	706481.3	Mature Rowan, possible RS Cache	Requires additional survey	Valleymount	Ian D & Eanna ni L	To be protected
15	698783.1	707595.3	Possible Drey	Requires additional survey	Valleymount	Ian D & Eanna ni L	To be protected
16	698988.7	706806.9	Possible Drey	Requires additional survey	Valleymount	Ian D & Eanna ni L	To be protected
17	699602.5	706439.2	Possible Drey	Requires additional survey	Valleymount	Ian D & Eanna ni L	To be protected
18	698514.4	708102.8	Possible Sett	Valleymount	Ian D & Eanna ni L	To be protected	To be protected
19	700202.5	706943.5	Possible Drey	Requires additional survey	Valleymount	Ian D & Eanna ni L	To be protected

Appendix B.10: Trees

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
1	700990.633	708088.4679	Mature Birch		Ballyknockan	Usna K and Sean M	To be retained where possible
2	700504.9504	707790.0485	Mature Birch		Ballyknockan	Usna K and Sean M	To be retained where possible
3	701894.226	709492.9836	Mature Hawthorn		Ballyknockan	Usna K and Sean M	To be retained where possible
4	701848.1716	709204.5366	Mature Scots Pine		Ballyknockan	Usna K and Sean M	To be retained where possible
5	701618.1817	710245.3327	Specimen Trees		Ballyknockan	Usna K and Sean M	To be retained where possible
6	701781.4111	710075.7611	Willow Stand		Ballyknockan	Usna K and Sean M	To be retained where possible
7	699089.9222	710447.6542	Mature Alder		Baltyboys	Billy F & Chris	To be retained where possible
8	699047.4486	710742.5065	Mature Alder		Baltyboys	Billy F & Chris	To be retained where possible
9	699060.2215	710751.432	Mature Alder		Baltyboys	Billy F & Chris	To be retained where possible
10	699091.7688	710468.2754	Mature Ash		Baltyboys	Billy F & Chris	To be retained where possible
11	698840.4432	710980.7899	Mature Ash		Baltyboys	Billy F & Chris	To be retained where possible
12	698849.6766	710978.0199	Mature Ash		Baltyboys	Billy F & Chris	To be retained where possible

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
13	698390.201	711895.009	Mature Ash		Baltyboys	Billy F & Chris	To be retained where possible
14	698352.6905	711925.5945	Mature Ash		Baltyboys	Billy F & Chris	To be retained where possible
15	698334.9162	711942.2146	Mature Ash		Baltyboys	Billy F & Chris	To be retained where possible
16	698995.0156	710816.7245	Mature Crab Apple		Baltyboys	Billy F & Chris	To be retained where possible
17	698391.586	711881.8514	Mature Hawthorn		Baltyboys	Billy F & Chris	To be retained where possible
18	698972.163	710865.6613	Mature Oak		Baltyboys	Billy F & Chris	To be retained where possible
19	698920.9178	710914.829	Mature Oak		Baltyboys	Billy F & Chris	To be retained where possible
20	697960.7339	712103.4523	Mature Oak		Baltyboys	Billy F & Chris	To be retained where possible
21	697974.8148	712107.8382	Mature Oak		Baltyboys	Billy F & Chris	To be retained where possible
22	698372.6576	711910.9365	Mature Rowan		Baltyboys	Billy F & Chris	To be retained where possible
23	698094.1131	708881.8893	Mature Stand of Trees		Baltyboys	Billy F & Chris	To be retained where possible
24	698286.9027	711974.3005	Mature Willow		Baltyboys	Billy F & Chris	To be retained where possible
25	697950.2838	708327.073	Mature Willows		Baltyboys	Billy F & Chris	To be retained where possible

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
26	697402.0682	712740.2902	Mature Ash		Blessington	Ian D & Eanna ni L	To be retained where possible
27	697378.254	712042.264	Mature Ash		Blessington	Ian D & Eanna ni L	To be retained where possible
28	697426.5811	712727.1423	Mature Beech		Blessington	Ian D & Eanna ni L	To be retained where possible
29	697013.872	712451.1486	Mature Beech		Blessington	Ian D & Eanna ni L	To be retained where possible
30	697007.1866	712428.8641	Mature Beech		Blessington	Ian D & Eanna ni L	To be retained where possible
31	697391.9914	712020.3925	Mature Beech		Blessington	Ian D & Eanna ni L	To be retained where possible
32	697366.0857	712006.6039	Mature Beech		Blessington	Ian D & Eanna ni L	To be retained where possible
33	697348.9544	711989.0549	Mature Beech		Blessington	Ian D & Eanna ni L	To be retained where possible
34	697301.7391	711953.33	Mature Beech		Blessington	Ian D & Eanna ni L	To be retained where possible
35	697237.1837	711912.8001	Mature Beech		Blessington	Ian D & Eanna ni L	To be retained where possible
36	697208.1442	711893.1618	Mature Beech		Blessington	Ian D & Eanna ni L	To be retained where possible
37	697266.253	712355.115	Mature Beech		Blessington	Ian D & Eanna ni L	To be retained where possible
38	698748.615	714481.972	Mature Beech		Blessington	Ian D & Eanna ni L	To be retained where possible

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
39	698714.911	714468.974	Mature Beech		Blessington	Ian D & Eanna ni L	To be retained where possible
40	698514.8	714494.175	Mature Beech		Blessington	Ian D & Eanna ni L	To be retained where possible
41	698578.219	714483.022	Mature Beech treeline		Blessington	Ian D & Eanna ni L	To be retained where possible
42	698502.491	714477.794	Mature Chestnuts		Blessington	Ian D & Eanna ni L	To be retained where possible
43	698490.864	714460.889	Mature Hazel		Blessington	Ian D & Eanna ni L	To be retained where possible
44	698002.6915	713139.6844	Mature Larch		Blessington	Ian D & Eanna ni L	To be retained where possible
45	696500.675	711193.044	Mature Lime		Blessington	Ian D & Eanna ni L	To be retained where possible
46	698496.966	714468.397	Mature Lime tree		Blessington	Ian D & Eanna ni L	To be retained where possible
47	697643.7368	711943.9287	Mature Maritime Pine		Blessington	Ian D & Eanna ni L	To be retained where possible
48	698802.417	714512.006	Mature Oak		Blessington	Ian D & Eanna ni L	To be retained where possible
49	697273.794	712319.619	Mature Scots Pine Grove		Blessington	Ian D & Eanna ni L	To be retained where possible
50	698781.692	714497.083	Mature stand of Beech		Blessington	Ian D & Eanna ni L	To be retained where possible
51	697269.148	711936.0943	Mature Sycamore		Blessington	Ian D & Eanna ni L	To be retained where possible

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
52	697985.0867	713148.1525	Mature Sycamores		Blessington	Ian D & Eanna ni L	To be retained where possible
53	698073.4448	713237.0677	Mature Treeline		Blessington	Ian D & Eanna ni L	To be retained where possible
54	697992.6635	713054.3347	Mature Treeline		Blessington	Ian D & Eanna ni L	To be retained where possible
55	697289.3085	712258.6104	Mature Willow		Blessington	Ian D & Eanna ni L	To be retained where possible
56	697131.6804	712206.3289	Mature Willow		Blessington	Ian D & Eanna ni L	To be retained where possible
57	697112.46	712157.4422	Mature Willow Stand		Blessington	Ian D & Eanna ni L	To be retained where possible
58	697383.2169	712078.4715	Mature Willow Stand		Blessington	Ian D & Eanna ni L	To be retained where possible
59	697217.9633	712107.7199	Mature Willow Stand		Blessington	Ian D & Eanna ni L	To be retained where possible
60	698811.153	714517.846	Semi-mature Alder		Blessington	Ian D & Eanna ni L	To be retained where possible
61	696288.858	710917.4441	Mature Beech		Blessington	Usna K and Sean M	To be retained where possible
62	696293.865	710869.3765	Mature Beech		Blessington	Usna K and Sean M	To be retained where possible
63	696320.5692	710824.9808	Mature Beech		Blessington	Usna K and Sean M	To be retained where possible
64	696369.3044	710774.9104	Mature Beech		Blessington	Usna K and Sean M	To be retained where possible

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
65	695715.886	710175.0673	Mature Beech Treeline	HBP	Blessington	Usna K and Sean M	To be retained where possible
66	696020.4808	710477.1586	Mature Beech		Blessington	Usna K and Sean M	To be retained where possible
67	695969.409	710469.8149	Mature Chestnut		Blessington	Usna K and Sean M	To be retained where possible
68	695971.078	710501.5262	Mature Conifer		Blessington	Usna K and Sean M	To be retained where possible
69	696389.3326	710518.8839	Mature Conifer Woodland		Blessington	Usna K and Sean M	To be retained where possible
70	696337.2594	710531.9022	Mature Elder		Blessington	Usna K and Sean M	To be retained where possible
71	696040.8428	710487.5065	Mature Elm		Blessington	Usna K and Sean M	To be retained where possible
72	696017.1428	710496.5191	Mature Hazel		Blessington	Usna K and Sean M	To be retained where possible
73	696286.1876	710521.2205	Mature Oak		Blessington	Usna K and Sean M	To be retained where possible
74	696257.4806	710492.8473	Mature Oak		Blessington	Usna K and Sean M	To be retained where possible
75	696064.5427	710486.1712	Mature Oak		Blessington	Usna K and Sean M	To be retained where possible
76	695951.0499	710478.4938	Mature Oak		Blessington	Usna K and Sean M	To be retained where possible
77	696355.6185	710538.2444	Mature Sycamore		Blessington	Usna K and Sean M	To be retained where possible

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
78	696376.6481	710543.5853	Mature Sycamore Treeline		Blessington	Usna K and Sean M	To be retained where possible
79	696392.3368	710547.5909	Mature Sycamore Treeline		Blessington	Usna K and Sean M	To be retained where possible
80	695508.1774	709948.9996	Mature Sycamores	Bat Potential	Blessington	Usna K and Sean M	To be retained where possible
81	696334.5826	711023.3477	Mature Treeline		Blessington	Usna K and Sean M	To be retained where possible
82	695351.4572	709784.435	Mature Treeline	Bat Potential	Blessington	Usna K and Sean M	To be retained where possible
83	695462.1127	709923.4637	Scots Pine Grove		Blessington	Usna K and Sean M	To be retained where possible
84	698990.0238	714232.6674	Hawthorn Hedge		Lacken	Billy F & Chris	To be retained where possible
85	698633.8466	713334.6645	Mature Ash		Lacken	Billy F & Chris	To be retained where possible
86	698918.8115	712767.851	Mature Ash		Lacken	Billy F & Chris	To be retained where possible
87	699294.8982	711565.0891	Mature Hawthorn		Lacken	Billy F & Chris	To be retained where possible
88	700393.8475	710865.4251	Mature Treeline		Lacken	Billy F & Chris	To be retained where possible
89	700356.7544	710898.0116	Mature Treeline		Lacken	Billy F & Chris	To be retained where possible
90	698981.7138	714249.7492	Mature Willow		Lacken	Billy F & Chris	To be retained where possible

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
91	700750.8032	710657.8675	Mature Treeline		Lacken	Billy F & Chris	To be retained where possible
92	696936.335	709058.93	Hedgerows		Tulfarris	Ian D & Eanna ni L	To be retained where possible
93	696749.897	708931.21	Hedgerows		Tulfarris	Ian D & Eanna ni L	To be retained where possible
94	696716.792	708915.246	Hedgerows		Tulfarris	Ian D & Eanna ni L	To be retained where possible
95	696844.698	709007.922	Mature Ash		Tulfarris	Ian D & Eanna ni L	To be retained where possible
96	697587.656	709440.45	Mature Beech		Tulfarris	Ian D & Eanna ni L	To be retained where possible
97	697445.679	709423.947	Mature Beech treeline		Tulfarris	Ian D & Eanna ni L	To be retained where possible
98	696805.361	708987.174	Mature Beech treeline		Tulfarris	Ian D & Eanna ni L	To be retained where possible
99	697592.055	709453.707	Mature Elm		Tulfarris	Ian D & Eanna ni L	To be retained where possible
100	697274.791	709294.56	Mature treeline		Tulfarris	Ian D & Eanna ni L	To be retained where possible
101	696995.589	709118.196	Mature Treeline		Tulfarris	Ian D & Eanna ni L	To be retained where possible
102	697009.684	709117.205	Mature Treeline		Tulfarris	Ian D & Eanna ni L	To be retained where possible
103	696924.431	709063.683	Mature Treeline		Tulfarris	Ian D & Eanna ni L	To be retained where possible

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
104	696865.256	709007.083	Mature Treeline		Tulfarris	Ian D & Eanna ni L	To be retained where possible
105	696865.256	709007.083	Mature Treeline		Tulfarris	Ian D & Eanna ni L	To be retained where possible
106	697826.842	709174.75	Semi-mature Ash		Tulfarris	Ian D & Eanna ni L	To be retained where possible
107	697558.013	709462.038	Semi-mature Ash		Tulfarris	Ian D & Eanna ni L	To be retained where possible
108	697377.6373	709728.2062	Mature Beech		Tulfarris	Usna K and Sean M	To be retained where possible
109	697276.0194	709680.2079	Mature Scots Pine		Tulfarris	Usna K and Sean M	To be retained where possible
110	698975.261	706877.035	Mature Ash		Valleymount	Ian D & Eanna ni L	To be retained where possible
111	700223.287	707099.259	Mature Beech		Valleymount	Ian D & Eanna ni L	To be retained where possible
112	700208.502	706964.188	Mature Birch		Valleymount	Ian D & Eanna ni L	To be retained where possible
113	700252.205	707103.986	Mature Birch		Valleymount	Ian D & Eanna ni L	To be retained where possible
114	698980.186	706964.873	Mature Crab Apple		Valleymount	Ian D & Eanna ni L	To be retained where possible
115	700221.222	707064.825	Mature Hazel		Valleymount	Ian D & Eanna ni L	To be retained where possible
116	700207.5177	707122.9138	Mature Oak		Valleymount	Ian D & Eanna ni L	To be retained where possible

ID	X Coordinate (ITM)	Y Coordinate (ITM)	Note	Additional Notes	Section	Surveyors	Treatment
117	700207.832	707176.857	Mature Oak		Valleymount	Ian D & Eanna ni L	To be retained where possible
118	698599.204	707939.825	Seasonally wet drain		Valleymount	Ian D & Eanna ni L	To be retained where possible

Appendix B.11 Ecologically Sensitive Areas

id	Name	X Coordinate (ITM)	Y Coordinate (ITM)	Section	Surveyors
1	Bird Nesting Potential	695540.343	709904.242	Blessington	Usna K and Sean M
2	Woodland containing Veteran Trees	696011.131	710466.806	Blessington	Usna K and Sean M
3	Sand Martin Nest Site	695381.592	709832.855	Blessington	Usna K and Sean M
4	River outfall area	701725.126	709936.297	Ballyknockan	Usna K and Sean M
5	River outfall area	701601.493	710256.686	Ballyknockan	Usna K and Sean M
6	River outfall area	701721.508	708935.085	Ballyknockan	Usna K and Sean M
7	River outfall area	701543.079	708671.356	Ballyknockan	Usna K and Sean M
8	River outfall area	700780.98	707834.408	Ballyknockan	Usna K and Sean M
9	River outfall area	700061.346	706825.132	Valleymount	Ian D & Eanna ni L
10	River outfall area	699025.023	706132.647	Valleymount	Ian D & Eanna ni L
11	River outfall area	698922.312	712976.896	Lacken	Billy F & Chris
12	Badger Sett	700216.143	707103.951	Valleymount	Ian D & Eanna ni L
13	Red Squirrel evidence	699605.745	706451.773	Valleymount	Ian D & Eanna ni L
14	Bank Erosion	699024.577	707213.619	Valleymount	Ian D & Eanna ni L
15	Wetland area	697978.24	712940.815	Blessington	Ian D & Eanna ni L
16	Wetland area	698003.006	712927.588	Blessington	Ian D & Eanna ni L
17	Bank Erosion	698983.392	706301.083	Valleymount	Ian D & Eanna ni L
18	wet area may require a boardwalk	698713.483	711265.431	Baltyboys	Billy F & Chris
19	Important Woodland Area	698774.439	709244.505	Baltyboys	Billy F & Chris
20	Wet Grassland	698625.964	709340.539	Baltyboys	Billy F & Chris
21	Wet Grassland	698220.986	708993.2	Baltyboys	Billy F & Chris
22	Wet Grassland	701161.988	708062.452	Ballyknockan	Usna K and Sean M
23	Badger Sett	698937.069	710016.597	Baltyboys	Billy F & Chris
24	Marsh Fritillary Area	695866.535	710314.841	Blessington	Usna K and Sean M

APPENDIX C: Species Lists

APPENDIX D: Site Photos