AECOM

Preliminary Ecological Appraisal Report

Quarterlands Road

Carvill Developments Limited

Project number: 60666971

November 2021

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
Scott McCollum Consultant Ecologist	Jenny Hunter née Jones Principal Ecologist	Paul Lynas Associate Director	Paul Lynas Associate Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
#1	21/10/21	Draft Issue	PL	Paul Lynas	Project Manager
#2	12/11/21	Updates	PL	Paul Lynas	Project Manager

Distribution List

# Hard Copies	PDF Required	Association / Company Name

Prepared for:

Carvill Developments Ltd

Prepared by:

Scott McCollum
Consultant Ecologist
E: scott.mccollum@aecom.com

AECOM Limited
The Clarence West Building
2 Clarence Street West
Belfast BT2 7GP
United Kingdom

T: +44 28 9060 7200
aecom.com

© 2021 AECOM Limited. All Rights Reserved.

This document has been prepared by AECOM Limited ("AECOM") for sole use of our client (the "Client") in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between AECOM and the Client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECOM.

Table of Contents

1. Introduction 1
1.1 Background 1
1.2 Aims and Objectives 1
1.3 Quality Assurance 1
2. Legislative and Policy Context 2
2.1 Wildlife Legislation 2
2.2 Planning Policy 2
3. Methods 3
3.1 Desk Study 3
3.1.1 Designated Sites 3
3.1.2 Data Requests 3
3.1.3 Historical mapping 3
3.2 Field Survey 3
3.2.1 Phase 1 Habitats 3
3.2.2 Invasive Species 4
3.2.3 Potential to Support Protected Species 4
3.2.3.1 Bats 4
3.3 Personnel Experience 4
3.4 Limitations 5
4. Results 6
4.1 Desk Study 6
4.1.1 Sites with Statutory Designations 6
4.1.2 Sites with Non-statutory Designations 6
4.1.3 Ancient / Long-established Woodland 6
4.1.4 Historical mapping 6
4.1.5 Data Requests 6
4.1.5.1 Northern Ireland Bat Group 6
4.1.5.2 CEDaR 7
4.2 Field Survey 12
4.2.1 Phase 1 Habitats 12
4.2.2 Invasive Species 13
4.2.3 Potential to Support Protected and Notable Species 13
4.2.3.1 Bats 13
4.2.3.2 Birds 13
4.2.3.3 Badger 13
4.2.3.4 Smooth Newt 13
4.2.3.5 Invertebrates 13
4.2.3.6 Other Protected and Notable Species 14
5. Identification of Ecological Constraints and Recommendations 15
5.1 Approach to the Identification of Ecological Constraints 15
5.2 Constraints and Recommendations 15
5.2.1 Non-statutory Designated Sites 15
5.2.2 Habitats 15
5.2.2.1 Overview of Habitats on Site 15
5.2.2.2 Priority Habitats 16
5.2.3 Invasive Species 16
5.2.4 Protected and Notable Species 16
5.2.4.1 Bats 16
5.2.4.2 Badger 18

5.2.4.3 Hedgehog 18
5.2.4.4 Terrestrial Birds 18
5.2.4.5 Invertebrates 18
6. Summary 20
7. References 21
8. Figures 22
Appendix A Species lists
Appendix B Site Photographs

Figures

Figure 1: Non-statutory designated sites within 1 km of the site
Figure 2: Indicative Phase 1 habitats and ecological constraints

Tables

Table 4.1: SLNCI within 1 km of the site. 6
Table 4.2: Ancient and Long-established Woodland within 1km of the proposed development. 6
Table 4.3: Northern Ireland Bat Group data request results. 7
Table 4.4: CEDaR data request results. 8

1. Introduction

1.1 Background

AECOM was commissioned by Carvill Developments Ltd, to conduct a Preliminary Ecological Appraisal (PEA) on lands north and northeast of 58 Quarterlands Road, Drumbeg, Lisburn (the site), to inform a proposed residential development at the site (the proposed development).

The site is located off Quarterlands Road, Drumbeg, County Down. The site comprises several field parcels at the eastern edge of a residential area, with open fields to the east separating the site from Drumbeg village. The approximate Irish Grid Reference for the centroid of the site is J2998966623. The site location is shown in Figure 1.

The proposed development comprises the construction of 17 no. detached dwellings with associated parking, landscaping, open space, site works and access arrangements from Quarterlands Road.

1.2 Aims and Objectives

This PEA was commissioned to identify whether there are known or potential ecological constraints (nature conservation designations, protected and notable habitats, and invasive, protected, and notable species) that may constrain or influence the design and implementation of the proposed works. This PEA Report (PEAR) follows the Guidelines for Preliminary Ecological Appraisal published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017). It addresses relevant wildlife legislation and planning policy as summarised in Section 2 of this PEAR.

The purpose of the PEA and PEAR is to:

- Identify and categorise all habitats present within the site and any areas immediately outside of the site where there may be potential for direct or indirect effects.
- Carry out an appraisal of the potential of the habitats recorded to support protected, notable, or invasive species of flora and fauna.
- Provide advice on ecological constraints and opportunities, including the identification (where relevant) of any requirements for additional habitat and species surveys and / or requirements for ecological mitigation.
- Provide a map showing the habitats identified on site and location of identified ecological constraints (if present).

1.3 Quality Assurance

This project has been completed in line with AECOM's Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, its quality as well as covering all aspects of environmental and Health and Safety management. All staff members are committed to establishing and maintaining our accreditation to the relevant international standards namely BS EN ISO 9001:2008 and 14001:2004 and BS OHSAS 18001:2007. In addition, our IMS requires careful selection and monitoring of the performance of all sub consultants and contractors.

2. Legislative and Policy Context

Many habitats and species are under threat due to anthropogenic activities, and whilst some of these habitats and species are protected through designated sites such as Special Areas of Conservation (SAC) or Areas of Special Scientific Interest (ASSI), much of our wildlife and natural environment fall outside these areas. Therefore, wildlife and the natural environment are afforded protection in Northern Ireland through legislation and policy.

Although the UK is no longer part of the European Union, European Directives are transposed into, or have provisions within, national legislation, affording legal provisions for wildlife in Northern Ireland. In effect, the statutory position currently remains the same. Northern Ireland also has several policies related to biodiversity and planning policy.

2.1 Wildlife Legislation

The following wildlife legislation is potentially relevant to the proposed development:

- The Wildlife (Northern Ireland) Order 1985 (as amended) (the Wildlife Order).
- The Wildlife and Natural Environment Act (Northern Ireland) 2011 (the WANE Act).
- The Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 (as amended).
- The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended).
- The Invasive Alien Species (Enforcement and Permitting) Order (Northern Ireland) 2019 (the IAS Order).

The above legislation has been considered when planning and conducting this PEA using the methods described in Section 3, when identifying potential constraints to the proposed development, and when making recommendations for further survey, design options and mitigation, as discussed in Sections 3-5. Compliance with legislation may require the obtainment of protected species licences prior to the implementation of the proposed development.

2.2 Planning Policy

Planning Policy Statements (PPS) are consolidated within the Strategic Planning Policy Statement (SPPS) (2015) which furthers the Northern Ireland Executive's commitment in its Programme for Government (PfG) to preserve and improve the built and natural environment and halt the loss of biodiversity. PPS set out the policies of the former Department of the Environment (now Department of Agriculture, Environment, and Rural Affairs (DAERA)) on aspects of land-use planning and apply to the whole of Northern Ireland. Their contents must be considered in preparing development plans and are also material to individual planning applications and appeals. PPS 2 Natural Heritage (2013) sets out the Department's planning policies for the conservation, protection, and enhancement of natural heritage, defined as "the diversity of our habitats, species, landscapes, and earth science features".

In addition, PPS 2 outlines the criteria that local councils and the Department for Infrastructure (formerly Planning NI) employ when processing planning applications which might affect nature conservation interests and to which developers should have regard when preparing proposals. Whilst there are policies within the document concerning European and Ramsar sites (Policy NH 1), species protected by law (Policy NH 2), and national and local sites of conservation importance (Policies NH 3 and NH 4 respectively), this revised version outlines the importance that is now placed on Northern Ireland Priority Species and Habitats (Policy NH 5) within the planning process.

3. Methods

3.1 Desk Study

A desk study was carried out to identify sites with nature conservation designations and protected and notable habitats and species potentially relevant to the proposed development. Where available, information relevant to the evaluation of the site was obtained from ordnance survey maps, aerial photographs, internet searches, current legislation, relevant literature, and database searches. Data were requested from the Centre for Environmental Data and Recording (CEDaR), the local records centre for Northern Ireland and the Northern Ireland Bat Group.

3.1.1 Designated Sites

A search was conducted for sites of nature conservation interest that may be relevant to the proposed development. Sites with statutory designations for nature conservation present within 2 km of the site, or further afield where a link (e.g. hydrological) exists, were searched for. These comprised sites with statutory designations, such as Special Protection Areas (SPA), SAC, Ramsar sites, and ASSI. Sites with non-statutory designations for nature conservation, such as Sites of Local Conservation Importance (SLNCI), and other relevant and notable sites, such as Ancient / Long-established Woodland (i.e. those identified by the Woodland Trust) and known Priority Habitats within 1 km were also searched for. The following data sources were used for the identification of sites of conservation interest:

- Northern Ireland Environment Agency (NIEA) Natural Environment Map Viewer.
- SLNCI dataset.
- Woodland Trust Ancient Woodland Database.

3.1.2 Data Requests

Species records within 2 km of the site were requested from CEDaR and the Northern Ireland Bat Group. Biological records can be received from a wide variety of sources and may or may not be comprehensive and accurate. However, if assessed in conjunction with a Phase 1 Habitat survey, they can contribute to a robust ecological assessment of a site. Records of non-native plant invasive species (i.e. species listed under Schedule 9 Part II of the Wildlife Order and Part 2 of the Schedule of the IAS Order) were also collated.

3.1.3 Historical mapping

A check was made on the 2nd Edition OS mapping (1846-1862) and other historical mapping on the Public Records for Northern Ireland website (PRONI) to establish the extent of hedgerows and the historical landscape.

3.2 Field Survey

3.2.1 Phase 1 Habitats

A Phase 1 Habitat survey was carried out in accordance with the standard survey method (JNCC, 2010). It involved categorising different habitat types and habitat features within the site. The information gained from the survey was used to determine the likely ecological value of the site, and to direct any more specific survey work which may need to be carried out prior to the proposed development.

The survey was carried out on 10 August 2021 by AECOM Ecologist Scott McCollum under suitable weather conditions for survey. The survey was conducted within the site and included the immediate adjacent area, where accessible, to search for evidence of protected species. All habitats present within the site were mapped, along with any observed relevant ecological constraints. Where ecological constraints were present, Target Notes were recorded and the position of these noted on the Phase 1 Habitat map. Typical and notable plant species were recorded for different habitat types and reflected the conditions at the time of survey. Nomenclature was according to Stace (2019). Data were recorded, and habitats mapped using a handheld mobile mapping device.

3.2.2 Invasive Species

A search was made for invasive plant species as listed in Schedule 9 Part II of the Wildlife Order and Part 2 of the Schedule of the IAS Order. Locations of such species were mapped using the mobile mapping device, and notes were made including species, extent, and form.

3.2.3 Potential to Support Protected Species

The standard Phase 1 Habitat survey method can be extended to identify the potential of habitats to host protected and notable species. An appraisal was made of the potential of the habitats present to support protected and notable species of plants and animals. When encountered, direct sightings and indirect signs (e.g. field signs) of protected species or auditory evidence were recorded. Additionally, preliminary roost assessments of trees for bats were carried out during the PEA, using the methods described in the following Section.

3.2.3.1 Bats

Preliminary Roost Assessment

During daylight hours, trees on the site were assessed from ground level for the presence of potential roost features (PRF). External signs that bats are using a tree as a roost include:

- Suitable entry points such as cracks/crevices, splits and tree injuries in bark, limbs and trunk or rot holes and knot holes. Substantial ivy stalks/other climbing plants can also provide shelter.
- Bat droppings: black droppings, 5-10 mm long that crumble to a fine dust when crushed and may be located on the ground or stuck to trunks.
- Staining: secretions from bat fur can cause oily brown stains in the vicinity of roost entrances. Urine stains may be present below the entrance to the roost.
- Audible squeaking from within the roost site.
- Large roost sites may produce an odour.
- Flies around the entrance of a roost, attracted by the smell of bat droppings.

Bats can also roost in less obvious places such as under ivy and loose tree bark. The results were used to grade trees within the site, as having Negligible, Low, Moderate, or High suitability for roosting bats in accordance with Bat Conservation Trust (BCT) guidelines (Collins, 2016).

Additionally, habitat features suitable for bats such as trees for flight lines and foraging areas were also assessed across the site.

3.3 Personnel Experience

Scott McCollum BSc (Hons) is a Consultant Ecologist with four years' professional experience. Scott has carried out ecological surveys and Preliminary Ecological Appraisal for a variety of projects including road schemes, railway works, housing and other large-scale private sector developments. Scott has gained experience in a wide variety of ecological surveys including surveys for bats, badger, otter, birds, butterflies, and reptiles, as well as habitat surveys and invasive species surveys.

Jenny Hunter BSc (Hons) MSc AMRSB is a Principal Ecologist with over eight years' professional experience of ecological consultancy. Jenny has extensive field experience of a variety of species and habitat survey techniques. She is proficient in Phase 1 Habitat survey across a variety of habitats including detailed hedgerow assessments. She has extensive experience of protected species surveys for bat, badger, otter, pine marten, and smooth newt, in addition to surveying for invasive species. Jenny leads AECOM Ecology's digital data capture, for high quality data collection in the field. She is constantly reviewing the use of this technology and training her colleagues in its use.

Dr Paul Lynas BSc (Hons) MRes CEnv MCIEEM is an Associate Director for Ecology and is an all-round ecologist with over 17 years' experience and is currently Convener of the Irish Section of CIEEM. He has undertaken numerous flora and fauna assessments for both public and private sector clients, working in multi-disciplinary teams on many large infrastructure and small-scale projects, from roads to data centres to residential developments. He has undertaken numerous flora and fauna assessments for both public and private sector clients, including those for protected species and habitats.

3.4 Limitations

The aim of a desk study is to help characterise the baseline context of the site and provide valuable background information that would not be captured by a single site survey alone. Information obtained during a desk study is dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for a habitat or species does not necessarily mean that the habitat or species do not occur in the area. Likewise, the presence of records for habitats and species does not automatically mean that these are relevant in the context of the proposed development.

No other limitations to constraint the results of this Report were identified.

4. Results

4.1 Desk Study

4.1.1 Sites with Statutory Designations

There are no sites with statutory designations for nature conservation within 2 km of the site. There is no hydrological connection from the site to any site with a statutory designation. Such sites are not considered further in this Report.

4.1.2 Sites with Non-statutory Designations

There are six SLNCI within 1 km of the site. These are detailed in Table 4.1. SLNCI are designated under local area plans, and are designated for their diversity of habitats, species, landscapes, and earth science features and are a material consideration in the planning process.

Table 4.1: SLNCI within 1 km of the site.

SLNCI	Reason(s) for designation	Distance from site
Quarterlands Road East	Wet grassland.	0.52 km southeast.
Ballygowan Meadow	Dry grassland.	0.60 km southeast.
Sir Thomas and Lady Dixon Park	Woodland, parkland.	0.60 km northeast.
Seymour Hill	River, grassland.	0.62 km northwest.
Flood Plain around Eel Weir	Rough grassland, fen.	0.65 km northeast.
Lambeg East	Woodland, scrub, grassland.	0.79 km west.

Source: SLNCI dataset.

4.1.3 Ancient / Long-established Woodland

There are two parcels of Long-established Woodland within 1 km of the site. These are presented in Table 4.2.

Table 4.2: Ancient and Long-established Woodland within 1km of the proposed development.

Site	Description	Distance from site
Site number 2807	2.17 ha of Long-established Woodland	0.74 km northeast.
Site number 2804	0.87 ha of Long-established Woodland	0.94 km northeast.

Source: NIAWI database.

4.1.4 Historical mapping

The northern field boundaries can be seen on the 2nd Edition OS map (1846-1862). The southern and western fields are also visible on this map, however they were more extensive at this time, being encroached on by housing in the second half of the 20th century. This shows that some of the hedgerows on site have likely been in place since at least the mid-19th Century which has given them time to mature and contribute to the wider ecological landscape in the area.

4.1.5 Data Requests

4.1.5.1 Northern Ireland Bat Group

The Bat Group data request contained 128 records dated between 1987 to 2018. These records contain roost records and also general observations of the following species: common pipistrelle, Daubenton's bat, brown long-eared bat and Leisler's bat. Numerous records of unidentified bats were also received. Many of the records are associated with Derriaghey to the northwest, Drumbeg to the east or the River Lagan to the north, and none seem directly associated with the site. Results of the closest bat record for each species are given in Table 4.3.

Table 4.3: Northern Ireland Bat Group data request results.

Scientific name	Common name	Date of closest record	Number of records	Distance (km) and direction from site centroid	
Unidentified bat	Unidentified bat	01/07/1988	25 records of unidentified bats.	0.41	E
Pipistrellus sp.	Pipistrelle	15/06/1991	7 records of pipistrelle species.	0.71	E
Myotis daubentonii	Daubenton's bat	25/08/2018	39 records of Daubenton's bat	0.78	NE
Nyctalus leisleri	Leisler's bat	16/06/1994	55 records of Leisler's bat.	1.18	NW
Plecotus auritus	Brown long-eared bat	27/09/2009	2 records of brown long-eared bat.	1.32	NW

Source: Northern Ireland Bat Group

4.1.5.2 CEDaR

Following a data request, CEDaR provided a dataset of records of species within 2 km of the site. This comprises 10,385 records of 2021 species. Records of species of conservation interest are presented in Table 4.4. None of these records appear to have originated from the site itself.

Table 4.4: CEDaR data request results.

Scientific name	Common name	Year(s)	Designations	Location(s)	No. Records
Mammals					
Sciurus vulgaris	Red squirrel	1995 – 2005	The Wildlife Order (Schedule 5), NI Priority Species	Sir Thomas and Lady Dixon Park, Malone Golf Course, Queensway, Dunmurry	11
Meles meles	Badger	1983 – 2020	The Wildlife Order (Schedule 5)	Sir Thomas and Lady Dixon Park, M1 Motorway at Dunmurry, Ballyskeagh and Tullynacross	4
Martes martes	Pine marten	2017 – 2018	The Wildlife Order (Schedule 5), NI Priority Species	Malone Golf Course, Drumbeg, Sir Thomas and Lady Dixon Park	3
Lutra lutra	Otter	2000 – 2016	The Habitats Regulations (Schedule 2), NI Priority Species	Drumbeg, Lisburn	3
Erinaceus europaeus	Hedgehog	1997 – 2016	NI Priority Species	Seymour Hill, Upper Malone Road, Sir Thomas and Lady Dixon Park, Queensway, Dunmurry	5
Haichoerus gryphus	Grey seal	2010 – 2018	The Wildlife Order (Schedule 5)	Sir Thomas and Lady Dixon Park, Lagan Valley Regional Park	3
Birds					
Sterna hirundo	Common tern	2012	Birds Directive Annex 1, The Wildlife Order (Schedule 1, Part 1)	Malone Golf Course	1
Alcedo atthis	Kingfisher	2008 - 2019	Birds Directive Annex 1, The Wildlife Order (Schedule 1, Part 1)	Lagan Valley Regional Park, Malone Golf Club, Drumbeg, Malone Upper, Ballyskeagh, Drum Bridge, Lambeg, River Lagan at Edenderry, Lagan Canal at Drum, Sir Thomas and Lady Dixon Park	24
Egretta garzetta	Little egret	2012 – 2019	Birds Directive Annex 1	River Lagan, Wolfenden's Bridge	2
Milvus milvus	Red Kite	2003	Birds Directive Annex 1	Dunmurry	1
Cygnus cygnus	Whooper swan	2014 – 2018	Birds Directive Annex 1, The Wildlife Order (Schedule 1, Part 1), NI Priority Species	Drumbeg	2
Tyto alba	Barn owl	2003 – 2018	The Wildlife Order (Schedule 1, Part 1), NI Priority Species	Sir Thomas and Lady Dixon Park, Dunmurry	2
Chroicocephalus ridibundus	Black-headed gull	2018	NI Priority Species	McIlroy Park	2
Pyrrhula pyrrhula	Bullfinch	2013 – 2018	NI Priority Species	Dunmurry, McIlroy Park	2

Scientific name	Common name	Year(s)	Designations	Location(s)	No. Records
Prunella modularis	Dunnock	2018	NI Priority Species	McIlroy Park, Lambeg	2
Turdus pilaris	Fieldfare	2001 – 2010	The Wildlife Order (Schedule 1, Part 1), NI Priority Species	Dunmurry	5
Anas querquedula	Garganey	2008	The Wildlife Order (Schedule 1, Part 1), NI Priority Species	M1 Bridge at River Lagan	1
Bucephala clangula	Goldeneye	1984 - 1992	The Wildlife Order (Schedule 1, Part 2), NI Priority Species	Ballydrain Lake at Malone Golf Club	3
Accipiter gentilis	Goshawk	2005 - 2012	The Wildlife Order (Schedule 1, Part 1), NI Priority Species	Sir Thomas and Lady Dixon Park, Drum Bridge	2
Vanellus vanellus	Lapwing	2009 – 2010	NI Priority Species	Lagan Valley Regional Park, Dunmurry	2
Linaria cannabina	Linnet	2018	NI Priority Species	McIlroy Park	1
Aythya ferina	Pochard	1976 – 1993	The Wildlife Order (Schedule 1, Part 2), NI Priority Species	Ballydrain Lake at Malone Golf Club	78
Turdus iliacus	Redwing	2001 – 2014	NI Priority Species	Dunmurry, Lagan Canal at Drum	12
Turdus torquatus	Ring Ouzel	1999	The Wildlife Order (Schedule 1, Part 1), NI Priority Species	Dunmurry	1
Anas clypeata	Shoveler	1977	The Wildlife Order (Schedule 1, Part 2), NI Priority Species	Ballydrain Lake at Malone Golf Club	1
Turdus philomelos	Song thrush	2000 – 2018	NI Priority Species	Edenderry Nature Reserve, McIlroy Park	3
Muscicapa striata	Spotted flycatcher	2003 – 2013	NI Priority Species	Sir Thomas and Lady Dixon Park	2
Sturnus vulgaris	Starling	2018	NI Priority Species	McIlroy Park	1
Passer montanus	Tree sparrow	1996 – 2015	NI Priority Species	Dunmurry	2
Aythysa fuligula	Tufted duck	1976 – 1993	NI Priority Species	Ballydrain Lake, Malone Golf Club	152
Buteo buteo	Buzzard	1999 – 2019	The Wildlife Order (Schedule 1, Part 1)	Tullynacross, Drumbeg, McIlroy Golf Course, Lambeg, Dunmurry, Sir Thomas and Lady Dixon Park, M1 motorway	22
Sylvia borin	Garden warbler	2015 – 2017	The Wildlife Order (Schedule 1, Part 1)	Sir Thomas and Lady Dixon Park, Malone Golf Course	2

Scientific name	Common name	Year(s)	Designations	Location(s)	No. Records
Ardea cinerea	Grey heron	1976 – 2018	The Wildlife Order (Schedule1, Part 1)	Balldrain Lake at Malone Golf Club, Drumbeg, Ballyskeagh, Seymor Hill	38
Asio otus	Long-eared owl	2005 – 2018	The Wildlife Order (Schedule 1, Part 1)	Dunmurry, Drumbeg, Malone Upper	4
Accipiter nisus	Sparrowhawk	2016 – 2019	The Wildlife Order (Schedule 1, Part 1)	Chimney Bridge, Lagan Canal	2
Invasive species					
Reynoutria japonica	Japanese knotweed	1992 - 2017	The Wildlife Order (Schedule 9, Part 2)	Drumvale, Drumbeg, Seymour Hill, Wolfenden's Bridge, Sir Thomas and Lady Dixon Park, Edenderry Nature Reserve	8
Persicaria wallichii	Himalayan knotweed	1981 – 2016	The Wildlife Order (Schedule 9, Part 2)	Drum Bridge, Edenderry, Mary Peter's Track	3
Nymphoides peltata	Fringed Water-lily	2008	The Wildlife Order (Schedule 9, Part 2)	Sir Thomas and Lady Dixon Park, Malone Golf Club	2
Impatients glanfulifera	Himalayan Balsam	1977 – 2017	The IAS Order (Schedule 2, Part 2)	Drum Bridge, Wolfenden's Bridge, Drumvale, Lagan Valley, Dunmurry, M1 Bridge, River Lagan, Sir Thomas and Lady Dixon Park, Mary Peter's Track, Edenderry Nature Reserve, Drumbeg Stream, Seymour Hill, Drumbeg, Malone Golf Club	28
Myriophyllum aquaticum	Parrot's-feather	2008	The IAS Order (Schedule 2, Part 2)	Sir Thomas and Lady Dixon Park	1
Hydrocotyle ranunculoides	Floating pennywort	2012	The IAS Order (Schedule 2, Part 2)	Sir Thomas and Lady Dixon Park	1
Elodea nuttallii	Nuttall's Water-weed	2014	The IAS Order (Schedule 2, Part 2)	Wolfenden's Bridge, River Lagan	2
Sciurus carolinensis	Grey squirrel	1995 – 2019	The IAS Order (Schedule 2, Part 1)	Sir Thomas and Lady Dixon Park, Malone Golf Club, Hillhall, Drumbeg, Ballyskeagh, Chimney Bridge at Lagan Canal, Derryaghy Glen, Dunmurry Golf Course, Lambeg, River Lagan, Upper Malone	27
Oxyura jamaicensis	Ruddy duck	1994	The IAS Order (Schedule 2, Part 1)	Ballydrain Lake at Malone Golf Club	1
Invertebrates					
Radix auricularia	Ear pond snail	1972 - 1999	NI Priority Species	Drum Bridge, M1 Bridge at River Lagan	3
Spermodea lamellata	Plated snail	1987	NI Priority Species	Ballylesson Road, Drumbo	1
Celastrina argiolus	Holly blue	2010	The Wildlife Order (Schedule 5)	Barnett's Park	2

Scientific name	Common name	Year(s)	Designations	Location(s)	No. Records
Leptidea juvernica	Cryptic wood white	2017	NI Priority Species	Lagan Towpath, Lagan Valley Regional Park	3
Additional 24 species of moths, all listed on NI Priority List by default.					
Fish					
Salmo salar	Atlantic salmon	1996	NI Priority Species	Dunmurry	2
Anguilla anguilla	European eel	2000	NI Priority Species	Drum Bridge	1
Plants					
Orthotrichum sprucei	Spruce's Bristole-moss	1954 – 2000	NI Priority Species	Drum Bridge	3

Source: CEDaR data received 2 Novemebr 2021.

4.2 Field Survey

4.2.1 Phase 1 Habitats

The site comprises two semi-improved fields delineated by hedgerows, located to the east of houses on the Quarterlands Road. An additional smaller area of grassland between the road and the fields is also present. No protected or Priority Species of plants were noted during survey.

Broad habitats noted within the site are detailed in the following paragraphs. Species lists for broad-scale habitats are provided in Appendix A with illustrative photographs provided in Appendix B. Indicative Phase 1 Habitats are presented in Figure 2.

A2.2 Scattered Scrub

Scattered scrub is associated with semi-improved grassland to the north of the site. Species include willow *Salix* sp., bramble *Rubus fruticosus* agg. and gorse *Ulex europaeus*. Brash piles are also scattered through this area.

B2.2 Semi-improved Neutral Grassland

The two field parcels at the east of the site contain semi-improved grassland in the centre of the fields. The sward was long during the survey with little management evident. The fields had a good diversity of species, with not just one plant dominant. Species noted include tufted hair-grass *Deschampsia cespitosa*, common bent *Agrostis capillaris*, Yorkshire-fog *Holcus lanatus*, meadow foxtail *Alopecurus pratensis*, common sedge *Carex nigra*, common knapweed *Centaurea nigra*, ribwort plantain *Plantago lanceolate*, tormentil *Potentilla erecta*, meadow vetchling *Lathyrus pratensis*, and common bird's-foot-trefoil *Lotus corniculatus*. Parts of the grassland have a species composition indicative of damper conditions, including soft-rush *Juncus effuses*, jointed rush *Juncus articulates*, sedges *Carex* spp., and meadowsweet *Filipendula ulmaria*.

This semi-improved grassland does not qualify as Lowland meadow Priority Habitat. In Northern Ireland Lowland meadow Priority Habitat is defined as having a high cover (>30%) of herbs (including sedges and wood-rushes, and absence or very low percentage (<10%) cover of rye-grass, white clover, creeping buttercup and noxious weeds, and having a rich mixture of native flowers, grasses and sedges (DAERA, 2018). There are nearby grassland SLNCI showing that this habitat is present in this area; Quarterlands Road East is designated for wet grassland and is 0.52 km southeast, and Ballygowan Meadow is designated for dry grassland and is 0.60 km southeast.

The core of these fields contain a good number of positive indicator species for lowland meadow Priority Habitat, and low amounts of the noxious weeds and negative indicators. However, the herb cover is not as high as 30% in most areas, and in parts the rush cover is quite high. The positive indicators present tend to be the more common and widespread positive indicator species. In our assessment these fields do not qualify as lowland meadow, but in their most diverse parts are tending toward a relatively species-rich sward. A more favourable management regime would improve the ecological condition of these fields, as they are verging on becoming rank and suffering from rush encroachment.

B6 Poor Semi-improved Grassland

Areas at the edges of the two fields at the east of the site are more disturbed with species such as broad-leaved dock *Rumex obtusifolius*, Yorkshire-fog, groundsel *Senecio vulgaris*, creeping buttercup *Ranunculus repens*, and common nettle *Urtica dioica*. Some of this area has been cleared of scrub that had encroached the field, and regenerating bramble is evident in some locations.

The grassland in the field beside the road does not have the same species diversity as the fields to the east, and shows no evidence of management. Soft-rush is the most dominant species in this area, with false oat-grass *Arrhenatherum elatius* the most common grass. Other grasses include cock's-foot *Dactylis glomerata*, Yorkshire-fog, common couch *Elymus repens*, meadow foxtail, with forbs including lesser stitchwort *Stellaria graminea*, broad-leaved dock, rosebay willowherb *Chamaenerion angustifolium*, bush vetch *Vicia sepium*, horsetail *Equisetum* sp., hedge bindweed *Calystegia sepium*, and meadow vetchling. Small amounts of willow are beginning to grow at the edge of the field.

G1 Standing Water

A stagnant ditch is present to the north of the site, associated with the hedgerow. The ditch measures c. 1 m in width with a substrate of soil and mud. The water depth is up to 30 cm, however most of the ditch was much shallower, and at time of survey several sections had dried up. The total length of the ditch is c. 30 m. Hedgerow debris such as dead bramble and leaves are present in the water, along with horsetail and common duckweed *Lemna minor*. No emergent vegetation was noted.

J2.1.2 Species-poor Intact Hedgerow
The semi-improved fields are separated by a hawthorn *Crataegus monogyna* hedgerow, c. 5 m in height. Although hawthorn is the dominant species, blackthorn *Prunus spinosa*, holly *Ilex aquifolium*, bramble, and dog-rose *Rosa canina* are occasionally present, with ivy *Hedera helix* growing on the bark. The hedgerow to the east of the field is up to 3.5 m high, and is mainly composed of hawthorn, bramble, and gorse. In places it grades into scrub. Bramble from the hedgerow had encroached into the fields to the west, but has been cut back. The hedgerow to the north is comprises similar species, but occasional yew *Taxus baccata* and willow are also present. Several broadleaved scattered trees are associated with the boundary hedgerows to the north and east of the site. Species noted include willow, ash *Fraxinus excelsior*, and sycamore Acer *pseudoplatanus.*

J2.3.2 Hedgerow with Trees
The hedgerows bounding gardens to the west and south also contain trees such as rowan *Sorbus aucuparia*, cherry laurel *Prunus laurocerasus*, alder *Alnus glutinosa*, ash, apple *Malus* sp., sycamore, horse-chestnut *Aesculus hippocastanum*, Leyland cypress *Cupressus* × *leylandii*, downy birch *Betula pubescens* and hazel *Corylus avellana*, as well as hedgerow species such as hawthorn and bramble.

Hardstanding
There is a small square area (c.22 m^2) of concrete in the northern field.

4.2.2 Invasive Species

No invasive species listed in Schedule 9 Part II of the Wildlife Order and Part 2 of the Schedule of the IAS Order were identified within the site. Bamboo was recorded on site, spreading from a garden to the south. Several canes are present. Bamboo has an invasive habit but has no legal implications.

4.2.3 Potential to Support Protected and Notable Species

4.2.3.1 Bats
Trees onsite were assessed for their suitability to host roosting bats. No trees on site were identified as having suitability for roosting bats, in the absence of PRF. There are no buildings onsite.

It is considered that the site and habitats provide good habitat for a variety of commuting and foraging bat species, connecting to a wider rural landscape.

4.2.3.2 Birds
No systematic bird survey was carried out; however, the site provides foraging and nesting habitat for a variety of terrestrial birds.

4.2.3.3 Badger
The site contains some suitable habitat for foraging badger, and habitat with potential for sett creation such as hedgerows. However, no evidence of badger was found on site or within 25 m of the site.

4.2.3.4 Smooth Newt
The ditches on site are shallow with no aquatic or emergent vegetation present. Based on the low water levels noted during survey, the ditches are likely to have fluctuating water levels throughout the year. Though some suitable terrestrial habitat exists, the ditches are considered suboptimal for smooth newt. Smooth newt are not considered further in this report.

4.2.3.5 Invertebrates
A good diversity of invertebrates was noted on site, including bees, ladybirds, hoverflies, bugs, grasshoppers, moths, and butterflies including speckled wood *Pararge aegeria* and small tortoiseshell *Aglais urticae*. Whilst vegetation onsite may provide food plants and shelter for a variety of invertebrates (including Priority Species), the habitats onsite are considered unsuitable for protected invertebrate species, with the exception of holly blue and cryptic wood white, which are protected butterflies.

4.2.3.6 Other Protected and Notable Species

There is no suitable habitat within the site for otter, red squirrel, pine marten, or common lizard, and no evidence of these species was identified. These species are not considered further in this report.

5. Identification of Ecological Constraints and Recommendations

5.1 Approach to the Identification of Ecological Constraints

Compliance with planning policy requires that the proposed development consider and engage the following mitigation hierarchy where there is potential for impacts on relevant ecological receptors:

1. Avoid features where possible.
2. Minimise impact by design, method of working or other measures (mitigation) e.g. by enhancing existing features.
3. Compensate for significant residual impacts, e.g. by providing suitable habitats elsewhere on the client-owned parts of the wider site.

This hierarchy requires the highest level to be applied where possible. Only where this cannot reasonably be adopted should lower levels be considered. The rationale for the proposed mitigation should be provided with planning applications, including sufficient detail to show that these measures are feasible and would be provided.

It must be noted that NIEA recommend that surveys should be submitted to the Planning Authority within one year of being carried out (NIEA, 2018).

5.2 Constraints and Recommendations

5.2.1 Non-statutory Designated Sites

There are six SLNCI and two parcels of Long-established Woodland within 1 km of the site. However, all these sites are located >0.5 km with no links that could result in impacts to these sites.

The proposed development's construction and operation is contained within the site, and there will be no impacts outside the site. There will be no impacts to any designated conservation site as a result of the proposed development.

5.2.2 Habitats

5.2.2.1 Overview of Habitats on Site

The site comprises semi-improved grassland delineated by hedgerows. The habitats within the site may provide foraging and shelter for a variety of invertebrates, birds, and mammals. The site is located in a rural setting on the edge of a village and is connected to the wider rural landscape by hedgerows and field parcels.

Habitat loss is required to facilitate the proposed development, including the removal of internal hedgerows (c.100 m in total), and the removal of grassland. Hedgerows on site are a Priority Habitat. The impacts to Priority Habitats and mitigation recommended are further discussed in Section 5.2.2.2.

Hedgerows around the edge of the site will be maintained, and a substantial c.5 m wide landscape buffer of native species planting along c.280 m of perimeter boundaries in total has been proposed including c.165 m of the external field boundaries.

The landscaping plan and strategy aims to:

- create a unique environment, rich in amenity space;
- to create strong and sustainable ecological linkages to the surrounding countryside; and
- finally, to improve the current ecological value of the land.

The plans include extensive planting and landscaping throughout the site, using native plants where possible. A large area of open space has also been possible to include within the site and this has been used to create a linear park from north to south across the site linking the landscape buffers at either end. This has the desired effect to create a continuous ecological loop of rich biodiversity. The linear park will incorporate hazel 'coppiced' trees and the longer-term maintenance of the space as an

interpretation of a coppiced woodland allows for planting below the power lines but also increases the biodiversity and connectivity through the proposed development. The woodland edge mixes to be planted within this area and an approximate total of 2000m^2 of wildflower areas, including those in private gardens with additional areas of mown paths for access provide foodplants for invertebrates, especially butterflies and other pollinators.

Retained habitat must be safeguarded during construction works.

No further surveys for habitats are recommended.

5.2.2.2 Priority Habitats

Priority Habitats are a material consideration under PPS 2 (NH 5), and adverse impacts on Priority Habitats must be avoided during the proposed works.

All hedgerows consisting predominantly (i.e. 80% or more cover) of at least one woody UK native species are considered a Northern Ireland Priority Habitat due to their significant biodiversity value and their wider value for providing foraging opportunities, shelter and connectivity to the wider environment (DAERA, 2020c). Hedgerows within the site meet this criterion and are considered as Priority Habitat. To facilitate the proposed development, the majority of the internal hedgerows (c.100 m) will be lost but the hedgerows around the perimeter will be retained and enhanced on site.

An extensive landscaping plan will be adopted using native species, of local provenance as far as possible, supply chain allowing. Hedgerows planting also include species such as ivy and dog rose to replicate the existing situation. The plan also includes a substantial buffer of native species planting to the boundaries. This will be used as an opportunity to enhance the already existing hedgerow boundary on site.

Within the landscape plan there are a number of additional hedgerows being proposed:

- Wildlife boundary hedge to periphery of site = 280 m.
- Garden mixed species hedges = 517 m.
- Single species (holly hedges – mainly along access road) = 116 m.

No further surveys are considered necessary for hedgerows. However, the retention of hedgerows around the site boundary will retain connectivity around the site and will provide food resources for a variety of animals including invertebrates.

5.2.3 Invasive Species

Although no scheduled invasive species were identified on site, bamboo is a plant with an invasive habit and can form large stands and displace native species. Although there are no legal requirements regarding bamboo, it can become a nuisance to residential land owners and as such it would be responsible to control this species during construction.

To prevent the bamboo from becoming an issue for the incoming residents, efforts should be made to remove it from site during construction. One possible way to achieve this would be as follows is to install an impermeable root membrane and remove the existing plants. In the first instance, a deep trench (c. 2 m) along the property boundary should be dug and an impermeable root membrane installed. This will prevent / slow bamboo from spreading from the adjacent property again. The existing bamboo within the site can then be treated with herbicide. A foliar treatment using a glyphosate-based herbicide should be applied between July and September. However, herbicide can have wider environmental impacts and should be used with care.

Invasive species are not considered to pose a constraint to the proposed development. No further survey is recommended.

5.2.4 Protected and Notable Species

5.2.4.1 Bats

The trees within the site have no suitability for roosting bats.

The site contains habitat of use to bats. Hedgerows provide linear commuting features, and grassland and hedgerows provide suitable foraging habitat. The site may be used by bats commuting through the wider landscape.

The proposed development will result in an increase in domestic and street lighting and the loss of a hedgerow that could be used by commuting / foraging bats. However, retained vegetation around the edge of the site will prevent light spill into surrounding areas and retained vegetation will still be available for commuting and foraging, both through and around the site. In particular, the proposed landscape planting at the rear of the site will maintain and enhance the commuting corridor for bats on the field side, where suitable habitat exists beyond the site and will become better connected to it.

New buildings may provide opportunities for roosting bats and garden hedgerows and vegetation will provide new opportunities for foraging bats. The landscape plan contains a number of elements which will benefit bats. The buffer of native species planting along the external field boundaries will have most benefit for commuting but will also provide opportunities for foraging bats. The strip of coppiced woodland through the site will also benefit bats as the trees mature. As the site is small and the development will contain both positive and negative habitat changes, the development is considered to result in a neutral change for bats, and bat activity surveys are not recommended.

All bat species in Northern Ireland are listed on Annex IV of the EC Habitats Directive(92/43/EEC) and are protected under the Habitat Regulations, under which it is an offence to:

- Deliberately to capture, injure or kill a bat.
- Deliberately to disturb a bat while it is occupying a structure or place which it uses for shelter or protection.
- Deliberately to disturb a bat in such a way as to be likely to:
  - affect its local distribution or abundance.
  - impair its ability to survive, breed or reproduce, or rear or care for its young.
  - impair its ability to hibernate or migrate.
- Deliberately to obstruct access to a bat roost.
- Damage or destroy a bat roost.

Bats are known to rely on visual clues in addition to using echolocation for both commuting and foraging, and various studies have revealed that bat vision functions better in low light. Luminance can disrupt bat activity by interrupting vision. Therefore, impacts of lighting on bats should be minimised both during and post development.

External (i.e. street) lighting across the site will be carefully considered to ensure perimeter structures and linear features remain dark, along with wildlife corridors, particularly the boundary hedgerows. Both during construction and post development, lighting designs will minimise light spill to habitat features and concentrate artificial light only where required. The use of floodlighting is not planned but if this changes during any stage of the proposed development, it may necessitate a bat activity survey. Lighting will be focussed mainly on the road network within the site and will avoid habitat features (i.e. hedgerows, trees) as far as possible. In particular, the external boundaries of the site along the field edges will be kept unlit and dark. Where lighting will be installed as a result of the proposed development, the following generic recommendations will be adopted:

- Lighting will be minimised wherever possible in terms of number of lights and the power of the lights (lux level). Using powerful lighting on wildlife corridors can, for some species, effectively sever connectivity;
- Linear features (i.e. field boundary hedgerows) will not be subject to light spill greater than 1 lux;
- Directional lighting, facing and located away from the site boundary will be used. This avoidance is particularly relevant to any mature trees on or adjacent to the site; and,
- Lighting will be turned off when not in use except to meet the minimum requirements for Health and Safety.

5.2.4.2 Badger

No evidence of badger was noted in the site. Nonetheless, the site provides potential habitat for commuting and foraging badgers. Badger are not considered to pose a constraint to the proposed development, however as it is possible that badger could use the site, a pre-construction survey for badger is recommended prior to any construction works commencing. It is also recommended that the following mitigation measures are implemented, to avoid potential impacts to badger during the construction of the proposed development.

- Lighting, where necessary, will be kept to essential locations only, with the position and direction of lighting being designed to minimise disturbance of the wider environment.
- Any temporary features which are liable to entrap wildlife will be covered or have a means of escape. Any excavation will either be covered or fenced off at the end of each working day, or include a means of escape for any animal which may fall in (e.g. mammal ladder or ramps).
- The surrounding trees and boundary vegetation will be maintained where possible.
- Water sources which may be used by badger will be safeguarded.

Badger is a protected species, listed on Schedule 5 of the Wildlife Order. It is an offence under Article 10 of the Wildlife Order to intentionally or recklessly kill, injure or take any badger. It is also an offence to intentionally or recklessly: damage or destroy, or obstruct access to, any structure or place which badger use for shelter or protection; damage or destroy anything which conceals or protects any such structure; and disturb a badger while it is occupying a structure or place which it uses for shelter or protection.

5.2.4.3 Hedgehog

No evidence of hedgehog was noted during survey; however, the site contains good habitat cover for hedgehog and field signs are less frequently observed than for other mammals. Hedgehog hibernate overwinter typically under log piles or trees roots, or within dense vegetation and scrub. The brash piles on site could be used by hedgehog for this purpose.

Potential impacts to hedgehog during the construction phase will be minimised and can be mitigated by avoidance. If construction is carried out during the winter months, potential hibernacula, such as log piles, dense vegetation, scrub etc., will be inspected for hibernating hedgehog prior to removal or maintenance. This should be carried out by a suitably experienced ecologist. Hedgehog is not considered to pose a constraint to the proposed development.

Hedgehog is a Priority Species. Priority Species are a material consideration during planning. Under PPS2, planning permission will only be granted for a development proposal which is not likely to result in the unacceptable adverse impact on, or damage to a Priority Species.

5.2.4.4 Terrestrial Birds

The hedgerows and trees within the site offer extensive nesting potential for a range of terrestrial bird species.

All bird nests are protected under the Wildlife Order, therefore without first making a check for nesting birds, any works (e.g. removal, pruning, general maintenance) within vegetation (e.g. hedgerows, trees,) during the nesting season (generally considered as March – August inclusive) could be a breach of Article 4 of the Wildlife Order.

Where vegetation removal or maintenance is required to facilitate the proposed development, this should be carried out during the winter months (usually considered to be September to February inclusive). If any clearance is required during March to August, a suitably experienced ecologist must be present to check all vegetation to be removed prior to clearance. Where development leads to a permanent loss of existing nesting sites, alternative nesting opportunities for birds should be provided as compensation (DAERA, 2020e). This could include the provision of replacement planting of native species and erection of bird nesting boxes. The landscape buffer of native species planting will also provide habitat for birds. No further survey for birds is recommended.

5.2.4.5 Invertebrates

No specific invertebrate survey was carried out; however, two protected invertebrate species noted in the data request from the wider area could occur on site. These are holly blue and cryptic wood white.

Both are butterfly species listed on Schedule 5 of the Wildlife Order. Cryptic wood white is also a Priority Species.

The larval foodplants of holly blue (holly and ivy) and cryptic wood white (meadow vetchling and other legumes) are all present within the site. It is therefore possible, though unlikely, that both species could be found on site.

A number of measures have been incorporated into the landscape plan to provide for these butterfly species but also for a number of other invertebrate and pollinator species. Firstly, a holly hedge of c.116 m in length will be incorporated into the site, whilst ivy has also been included into the hedgerow planting along with other species to provide diversity and to act as the foodplants for the holly blue butterfly. Also, within the woodland edge planting and other areas on site, meadow vetchling and other similar plant species have been included in the planting plan which will provide for the cryptic wood white butterfly.

In addition to the planting of a substantial c.5 m wide buffer around c.280 m of the site perimeter, an interpretation of a coppiced hazel woodland will stretch across the middle of the site providing connectivity and native species for feeding and sheltering within. The woodland edge planting plan includes a number of early flowering species which will provide nectar sources in the early spring when they are most needed and the longer grassland and 2000m^2 of wildflower areas with mown paths will also provide habitat for many invertebrates to live in.

6. Summary

AECOM were commissioned by Carvill Developments Ltd to conduct a PEA at a site on the Quarterlands Road, Drumbeg to inform a proposed residential development. The following summarises the findings of the survey and recommendations for further work:

- There are no statutory designated sites within 2 km of the site, and no non-statutory designated sites within 0.5 km of the site. There is no viable impact transfer pathway to any site. There will not be significant effects to any designated conservation site as a result of the proposed development. No further work is recommended for designated sites.
- Habitats within the site include semi-improved fields delineated by hedgerows. No protected or Priority Species of plants were noted during survey.
- Hedgerows are a Priority Habitat. The proposed development will be constructed within several fields and require the removal of a hedgerow. Hedgerow lost will be replaced by a landscape buffer of native species planting of greater depth than the existing boundaries. No further habitat survey is recommended.
- No scheduled invasive species were noted on site and are considered likely absent. Bamboo, a species with an invasive habit, is present on site, and potential treatment options have been suggested. No further survey is recommended.
- No trees within the site have suitability for roosting bats. The proposed development will result in removal of a hedgerow that could be used by commuting bats, however potential new roosting locations in the new buildings and new planting of native species will compensate for the loss. Bat activity surveys are not recommended.
- No evidence of badger was identified within the site. The site contains potential habitat for badger. Mitigation has been prescribed to protect badger during construction. A pre-construction survey for badger is recommended prior to any construction works commencing.
- Hedgehog could occur on site. Potential hedgehog hibernacula must be searched prior to any works during the winter months. Other mitigation prescribed for badger will benefit hedgehog.
- Vegetation onsite offers potential nesting habitat for common bird species. Vegetation clearance / maintenance should be carried out outwith the bird breeding season (March to August inclusive), unless first checked by a suitably experienced ecologist.
- Suitable habitat with the preferred larval foodplants exist on site for holly blue and cryptic wood white butterflies. Landscape planting has included over 100 m of holly hedge and ivy within the new and existing hedges. Other foodplants and suitable habitats will be created across the site providing excellent resources for invertebrates and pollinators.
- There is no suitable habitat for any other protected species (e.g. other protected invertebrates, common lizard, red squirrel, pine marten, smooth newt, otter) within the site. No further surveys for these species is recommended.
- An extensive landscaping plan and strategy to help blend the site into the surrounding countryside area has been prepared separately. This incorporates a wide range of native species buffer planting around the site perimeter and a coppiced woodland interpretation strip across the middle of the site incorporating woodland edge planting, wildflower areas and mown strips. This will boost biodiversity on site and create connectively through it.

7. References

CIEEM (2017). *Guidelines for Preliminary Ecological Appraisal*, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines*, 3rd edition. The Bat Conservation Trust, London.

DAERA (2021). *NIEA Natural Environment Map Viewer.* Available at: https://appsd.daera-ni.gov.uk/nedmapviewer/ Accessed 21 October 2021.

DAERA (2020a). Standing Advice: Badgers. DAERA, Belfast.

DAERA (2020b). Standing Advice: Bats. DAERA, Belfast.

DAERA (2020c). Standing Advice: Hedgerows. DAERA, Belfast

DAERA (2020d). Standing Advice: Priority Habitats. DAERA, Belfast.

DAERA (2020e). Standing Advice: Wild Birds. DAERA, Belfast.

DAERA (2018). Northern Ireland Priority Habitat Guide: Lowland meadow. DAERA, Belfast.

DOE (2013). PPS 2 Natural Heritage, Belfast.

DOE (2015). *Valuing Nature: A Biodiversity Strategy for Northern Ireland to 2020.* DOE, Northern Ireland.

Habitas (2021). *Northern Ireland Priority Species*. Available at: https://www.habitas.org.uk/priority/ Accessed 21 October 2021.

JNCC (2010). *Handbook for Phase 1 Habitat survey – a technique for environmental audit.* Joint Nature Conservation Committee, Peterborough.

Maddock, A. (ed). (2008). *UK Biodiversity Action Plan: Priority Habitat Descriptions*. BRIG.

NIEA (2018). Preliminary Ecological Appraisals, NIEA Specific Requirements. NIEA, Belfast.

Public Records Office Northern Ireland (PRONI) (2021). *Historical Map Viewer*. Available at https://www.nidirect.gov.uk/services/search-proni-historical-maps-viewer Accessed 21 October 2021.

Stace, C. (2019). *New Flora of the British Isles*, 4th edition. Stowmarket, United Kingdom: C&M Floristics.

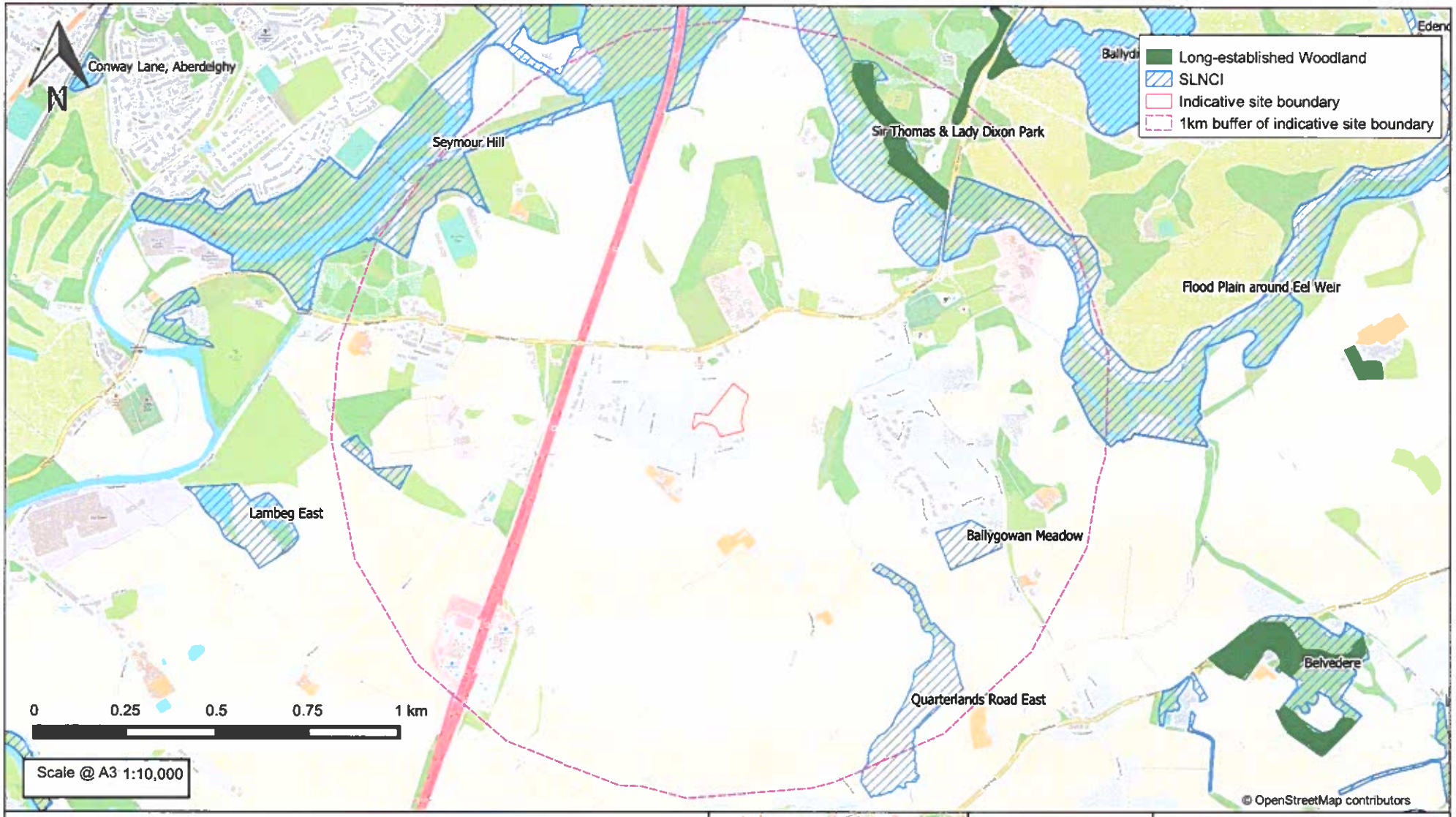
The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended).

The Invasive Alien Species (Enforcement and Permitting) Order (Northern Ireland) 2019.

The Wildlife (Northern Ireland) Order 1985 (as amended).

The Wildlife and Natural Environment Act (Northern Ireland) 2011.

8. Figures



Title	Non-statutory designated sites within 1 km of the site
Project	Quarterlands Road
Figure No.	1
Client	Carvill Developments Ltd.

Project No	60666971
Date	October 2021
Drawn By	SMcC
Checked By	JH
Approved By	PL

AECOM Ltd.
The Clarence Street West Building
2 Clarence Street
Belfast
BT2 7GP

Tel: 028 9060 7200

Title	Indicative Phase 1 Habitats and ecological constraints
Project	Quarterlands Road
Figure No.	2
Client	Carvill Developments Ltd.

Project No.	60666971
Date	October 2021
Drawn By	SMcC
Checked By	JH
Approved By	PL

AECOM

AECOM Ltd.
The Clarence Street West Building
2 Clarence Street
Belfast
BT2 7GP

Tel: 028 9060 7200

Appendix A Species lists

Table A.1: Hedgerow species list.

Scientific name	Common name
Acer campestre	Field maple
Acer pseudoplatanus	Sycamore
Calystegia sepium	Hedge bindweed
Chamaenerion angustifolium	Rosebay willowherb
Cotoneaster sp.	Cotoneaster
Alnus glutinosa	Alder
Malus sp.	Apple
Aesculus hippocastanum	Horse-chestnut
Betula pubescens	Downy birch
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Cupressus × leylandii	Leyland cypress
Fraxinus excelsior	Ash
Gallium aparine	Cleavers
Hedera helix	Ivy
Ilex aquifolium	Holly
Phyllostachys sp.	Bamboo
Prunus laurocerasus	Cherry laurel
Prunus spinosa	Blackthorn
Rosa canina	Dog-rose
Rubus fruticosus agg.	Bramble
Salix spp.	Willow
Taxus baccata	Yew
Sorbus aucuparia	Rowan
Ulex europaeus	Gorse
Urtica dioica	Common nettle
Vicia sepium	Bush vetch

Table A.2: Semi-improved grassland species list.

Scientific name	Common name
Agrostis capillaris	Common bent
Alopecurus pratensis	Meadow foxtail
Carex flacca	Glaucus sedge
Carex nigra	Common sedge
Carex spp.	Sedges
Centaurea nigra	Common knapweed
Deschampsia cespitosa	Tufted hair-grass
Elymus repens	Common couch
Filipendula ulmaria	Meadowsweet
Holcus lanatus	Yorkshire-fog
Juncus articulatus	Jointed rush
Juncus effuses	Soft-rush
Lathyrus pratensis	Meadow vetchling
Lapsana communis	Nipplewort
Lolium perenne	Perennial rye-grass
Lotus corniculatus	Common bird's-foot-trefoil
Phalaris arundinacea	Reed canary-grass
Plantago lanceolata	Ribwort plantain
Potentilla erecta	Tormentil
Ranunculus acris	Meadow buttercup
Rumex obtusifolia	Broad-leaved dock
Stellaria graminea	Lesser stitchwort
Vicia sepium	Bush vetch

Table A.3: Poor semi-improved grassland species list.

Scientific name	Common name
Alopecurus pratensis	Meadow foxtail
Arrhenatherum elatius	False oat-grass
Calystegia sepium	Hedge bindweed
Cardamine sp.	Bitter-cress
Cirsium vulgare	Spear thistle
Chamaenerion angustifolium	Rosebay willowherb
Dactylis glomerata	Cock's-foot
Elymus repens	Common couch
Epilobium montanum	Broad-leaved willowherb
Equisetum sp.	Horsetail
Galium aparine	Cleavers
Hedera helix	Ivy
Holcus lanatus	Yorkshire-fog

Scientific name	Common name
Hypericum androsaemum	Tutsan
Juncus effuses	Soft-rush
Lathyrus pratensis	Meadow vetchling
Lapsana communis	Nipplewort
Lolium perenne	Perennial rye-grass
Lotus corniculatus	Common bird's-foot-trefoil
Persicaria maculosa	Redshank
Phalaris arundinacea	Reed canary-grass
Plantago lanceolata	Ribwort plantain
Potentilla anserina	Silverweed
Ranunculus repens	Creeping buttercup
Rumex obtusifolia	Broad-leaved dock
Senecio vulgaris	Groundsel
Stellaria graminea	Lesser stitchwort
Vicia sepium	Bush vetch
Urtica dioica	Common nettle

Appendix B Site Photographs

Photograph 1: Semi-improved grassland field at the north of the site.

Photograph 2: The field edges are less diverse with more evidence of disturbance. Scrub has been cleared from the edges of the field and left in brash piles.

Photograph 3: Bamboo on site has spread from a neighbouring garden.

Photograph 4: Hedgerow to be removed to facilitate the proposed development.

Photograph 5: A stagnant ditch is present to the north of the site.

aecom.com

aecom.com