6.0 BIODIVERSITY

6.1 Introduction

This Biodiversity Chapter has been prepared by Ecology Ireland Wildlife Consultants Ltd. (Ecology Ireland) and describes the habitats, flora and fauna present at the application site of the proposed development at the existing quarry in Killaskillen, Kinnead, Co. Meath, operated by Breedon Cement Ireland Limited (hereafter referred to as Breedon). The proposed development will comprise the deepening of the north-western portion of the existing limestone quarry to 10m OD over an area of *c*. 4.13 hectares, which is consistent with the level approved for the adjoining quarry extraction area, as permitted under planning ref. 98/2026 (An Bord Pleanála ref. PL17.111198). The proposed development will not result in any increase to the annual output of the existing limestone quarry or to the production capacity of the existing cement plant.

Assessment of the potential impacts on the existing ecology of the study area (*i.e.,* application site and surrounding area) arising from the proposed development was subsequently made, and appropriate mitigation measures to reduce potential negative impact(s) to an acceptable level were considered.

This Biodiversity Chapter has been prepared using 'Guidelines on the Information to be contained in Environmental Impact Assessment Report (EIAR)' (EPA 2022).

The main objectives of this Biodiversity Chapter were to:

- Undertake a detailed desktop review of available ecological data of the study area, including a review of designated nature conservation sites in the adjacent hinterland.
- Complete ecological field surveys in order to obtain information on the baseline ecology of the study area.
- Evaluate the ecological importance of the ecological resources of the study area.
- Assess potential impacts on the existing ecology that could arise from the proposed continuation and extension of quarry works within the application site.
- Develop avoidance and mitigation measures, to eliminate or reduce potential negative impact(s) on the existing local ecology arising from the deepening of part of the existing quarry.

6.1.1 Statement of Authority

This report has been prepared by Dr. Gavin Fennessy with input from a team of specialist ecologists including Marie Kearns, Athena Michaelides and John Deasy. Field surveys and *Post hoc* analysis were carried out by Dr. Gavin Fennessy (B.Sc. PhD MCIEEM) and John Deasy.

Dr. Fennessy is a highly experienced ecologist with over 20 years of experience in consultancy. He is Principal Ecologist and Managing Director of Ecology Ireland Wildlife Consultants Ltd. He is a member of the Irish Policy Group of the CIEEM and is a guest lecturer at University College Cork. He and his team have prepared numerous ecological impact assessments, for all types of projects and plans throughout Ireland.

John Deasy is an ecological consultant with experience across a range of disciplines including botanical and habitat surveys, bird surveys, mammal surveys and protected invertebrate surveys. He has nearly 10 years of experience as a professional ecologist and has undertaken a range of botanical and habitat surveys including baseline surveys for renewable energy projects, shared-use greenways and domestic and commercial properties. These surveys have included non-native invasive species surveys, rare species surveys and evaluations of habitats listed on Annex I of the EU Habitats Directive. John holds an MSc. in Ecological Assessment and a BSc. in Earth and Environmental Science from University College Cork. He is a member of the Botanical Society of Britain and Ireland.

Marie Kearns (BSc MSc) has almost 5 years of professional experience in ecological surveying, ecological impact assessment and the appropriate assessment process. She has worked on projects related to renewable energy, infrastructure, housing, quarries and various other development projects. She is an experienced field ecologist with a diverse ecological survey profile, including habitats and flora, marine and terrestrial mammals, and birds. She has held NPWS Licenses for photographing wild animals. Marie is also experienced in producing maps and visualising biological datasets using QGIS. Marie assisted in the drafting of this Chapter and in the collation of input from specialist field surveys.

Athena Michaelides (BSc) is an ecologist with over 5 years post-graduate experience. Athena has contributed to ecological reports and assessments, and she is experienced in impact assessment and GIS analysis. Athena has assisted in the preparation of this report.

6.1.2 Site Description and Context

The application site is located in the townland of Killaskillen, County Meath. The application site, which occupies an area of approximately 4.13 hectares, forms part of the existing Breedon landholding, which is approximately 286 hectares (See Figure 6.1). The application site forms the north-western portion of the existing limestone quarry which has been subject to ongoing quarrying activity. As well as this limestone quarry, the wider site comprises a cement plant to the southwest, an asphalt plant to the southeast, and a shale quarry to the north. The shale quarry is connected to the wider site via a private underpass road that runs under the local road (L8021). The L8021 passes through sections of the landholding and also forms part of the east landholding boundary. Outside the quarry, the landholding is primarily in agricultural use, apart from an area of peatland, likely degraded through historic peat extraction, interspersed with scrub to the south of the limestone quarry. The Kinnegad River and M6 motorway borders the landholding to the north. There are 110kv ESB lines traversing the southern portion of the application site which connect with an existing sub-station, located within cement plant.

The surrounding lands can be described as rural in character with lands generally farmed as moderate intensity agricultural grassland supporting livestock production or under forestry management. The peatland located within the south-most section of the landholding extends west and east (Toor Bog). Relatively small pockets of forestry plantation abut parts of this peat deposit, most notably at the southwestern end. Larger bogs where peat has been mechanically stripped out in the past are present *c.* 1km to the east (Bogtown Bog) and *c.* 1.3km to the west (Derryhinch Bog).

Residential properties in the vicinity of the site primarily comprise of one-off dwellings fronting onto the county roads to the east and west of the site. Kinnegad town is located

approximately 2 km to the northeast, across the M6, and the village of Ballinabrackey is located approximately 4km south of the application site.

The application site lies within the Boyne Catchment in Hydrometric Area 07. There are no watercourses within or adjacent to the proposed application site. The nearest EPA-registered surface watercourses to the application site are the Killaskillen Stream (*c.* 650m northeast) and the Baltigeer Stream (*c.* 1.1km west). Both are 1st order watercourses and tributaries of the Kinnegad River. The Killaskillen Stream also forms part of the northwest boundary of the Breedon landholding. The Kinnegad River forms the north-most boundary of the Breedon landholding, *c*. 1.3 km north of the application site. The course of the Kinnegad River has been straightened in sections, including that forming the northern boundary of landholding. The Kinnegad River, and its tributaries, has a Q Value of 3, a Water Framework Directive (WFD) Status (2013-2018) of "Moderate" with a Risk Status of "Under Review"[1]. The Kinnegad River flows east, ultimately flowing into the Boyne River *c*. 12.8 km downstream of the landholding. The Boyne River forms part of the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA.

6.1.3 Existing Quarry Operations

The existing quarry operates under the EPA's Extractive Industries registration number, QS0608. Quarrying commenced at the site in 2002 with the current capacity to produce up to 700,000 tonnes of cement per annum. In April 2018, Lagan Cement, was acquired by the Breedon Group and now operates under Breedon Cement Ireland Limited.

The manufacture of cement combines both the cement works and the quarries on site. The main raw materials used are limestone and shale. Cement is produced in a specially designed kiln and is heated to very high temperatures with the required mix of raw materials. These materials need to be finely ground and mixed in precise proportions to form a raw meal of required chemistry. The raw meal is heated in the kiln process to form what is known as clinker. The clinker is milled down to produce the final cement powder. Gypsum is also added at the final grinding stage to control the setting time of the cement.

The existing limestone quarry and cement works were granted planning permission by Meath County Council in April 1999 (Ref. No. 98/2026), a decision that was upheld by An Bord Pleanála in 2000 (Ref. No. PL17.111198). In the quarry's planning history, planning permissions were granted most recently in 2019 and 2021. Permission for the establishment of a construction and demolition (C&D) waste recovery facility for the importation, processing and recovery of road planings and bituminous materials, within an overall application area of 1.3ha at the existing asphalt production facility was granted in February 2019 (TA181329). Permission was granted in November 2021 for the construction of a seven-bay clinker store of approximately 2,103 sqm gross floor area and all ancillary site development works within an application area of 0.61 hectares (211146). See Chapter 2 (Site Location and Context) of the EIAR for a complete summary of previously granted planning permissions related to the operation of the quarry.

The quarry has operated under licence since May 2001 (original IPPC licence, ref: P0487-01) and is currently operating under Industrial Emissions (IE) licence (Ref: P0487-07), granted in February 2018. This most recent licence resulted in changes to quarry blast AOP limits, TOC

[1] https://gis.epa.ie/EPAMaps/

limits on A201 and a number of other amendments from the previous licence including groundwater and ambient dust monitoring requirements[2]. See Table 6.1 below for the licencing history under which the quarry has operated.

Table 6.1: EPA licencing history

Licence Reference	Date of Grant	Description
P0487-01	May 2001	Original IPPC licence.
P0487-02	November 2003	Increase in Cement Production
P0487-03	May 2006	Burn waste and bone meal as a fuel
P0487-03 Technical amendment	2007	Use of dewatered drinking sludge as a secondary raw material
P0487-04	May 2008	Introduce waste as raw material and fuel sources
P0487-05	January 2009	Facilitate the introduction of additional waste types, namely SRF (solid recovered fuel and TDF (tyre derived fuel) as fuel sources.
P0487-06	March 2012	Facilitate the introduction of additional waste types, namely LRF (liquid recovered fuel) and to increase the extent of the quarrying operations over lands to the north, east and south.

[2] https://epawebapp.epa.ie/licences/lic_eDMS/090151b280672c8f.pdf

Figure 6.1: Site location Map.

6.2 Proposed Development Description

The proposed development is intended to facilitate the continued operation of Breedon Cement Limited operations at the Kinnegad quarry and will take place within an area already permitted for quarrying activities. The proposed development involves the deepening of the north-western portion, the application site, of the existing limestone quarry to 10m OD.

This proposal is designed to improve both the viability and sustainability of the Breedon Quarry through the continued use of locally available raw materials. This will involve the deepening of the north-western portion of the quarry extraction area by four extractive benches to 10m OD, over an area of *c*. 4.13 hectares. The proposed development will not result in any increase to the output of the existing limestone quarry or to the production capacity of the existing cement plant. The proposed development will be served by the existing on-site haul road from the existing vehicular access point on the L8021 to the northeast of the site.

Access to the quarry is currently provided from the local road (L8021) that runs in a north-south direction and bounds the eastern portion of the quarry site. The proposed development will not result in any increase to the output of the existing limestone quarry or to the production capacity to the existing cement plant. The proposed development will be served by the existing on-site haul road from the existing vehicular access point on the L8021 to the northeast of the site.

The proposed deepening of this section of the existing quarry will be consistent with the permitted depths of the adjacent permitted quarry area and is intended to facilitate the efficient extraction of material from both the overall quarry. The proposed development is intended to be carried out in phases (as outlined in Chapter 3 of the EIAR) whereby the adjacent permitted quarry area and the proposed development area will be quarried of material in tandem.

6.2.1 Quarry Operations

It is proposed that the application site will be operated in a similar fashion as the existing permitted quarry operation.

The cement plant operates 24 hours per day, 7 days a week. The plant shuts down for one to three weeks per annum for maintenance. Deliveries of raw material to the site will not normally occur on Public Holidays.

6.2.2 Quarry Restoration

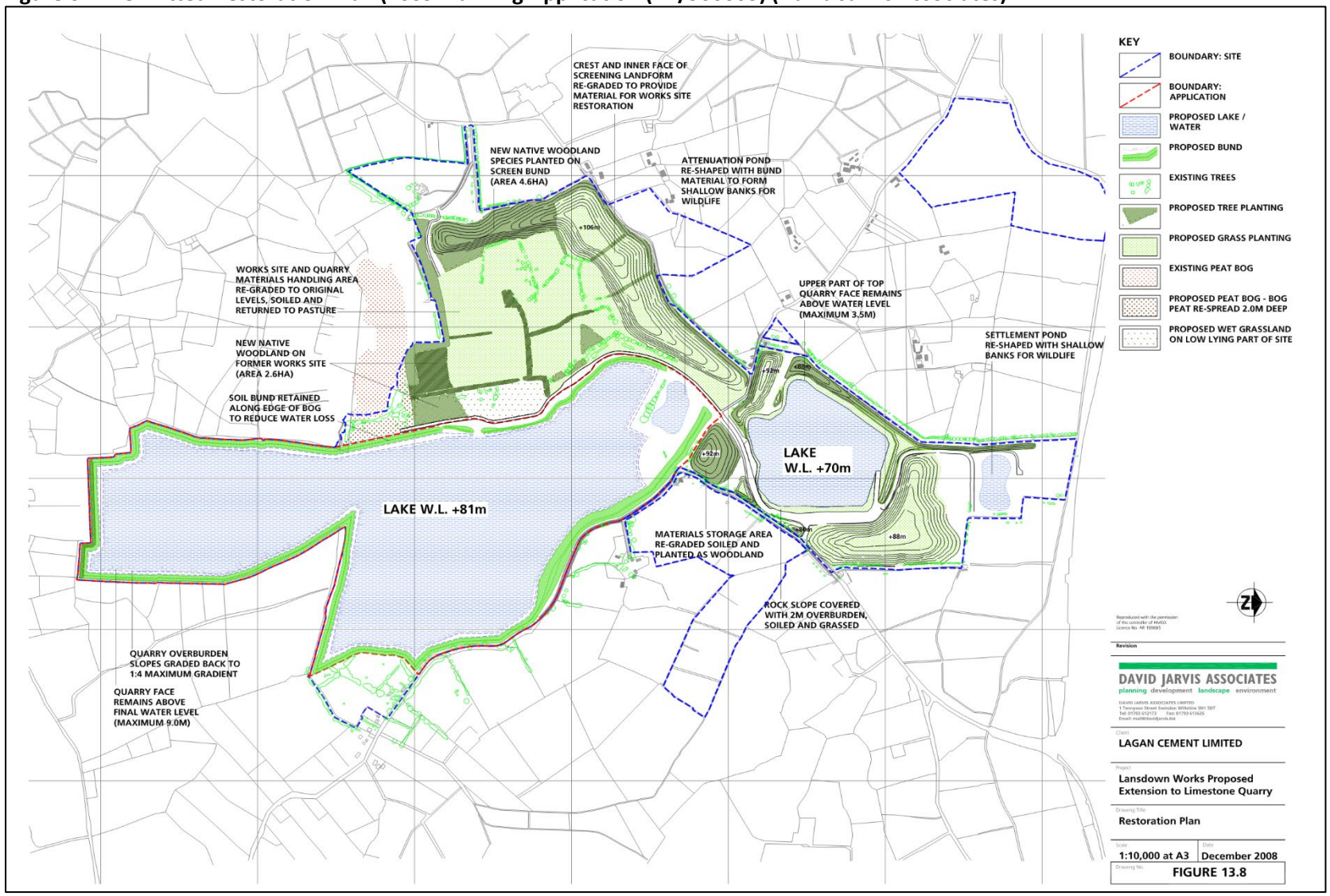
The quarry, including the application area, will be restored once extraction activities have ceased. The Restoration Plan for the quarry was submitted as part of the original planning permission (98/2026, PL17.111198), with an updated version for the permitted extension to the existing limestone quarry in 2009 (TA/900603). See Figure 6.2 for the Restoration Plan Layout originally included with the TA/900603 planning application.

Following the completion of quarrying operations, the water table within the quarry voids, including the application site, will be allowed to return to near rockhead level with several sections of 'cliff' faces above water level, up to 9m. The rock faces and quarry works area will be re-graded with soil and seeded with grass and planted with woodland. Existing berms will

be planted with woodland. The existing settlement ponds will be re-shaped with shallow banks.

In the longer term the restoration and landscaping measures outlined in the already permitted Restoration Plan will lead to a likely positive effect on biodiversity by enhancing and creating higher value habitats within the quarry.

Figure 6.2: Permitted Restoration Plan (2009 Planning Application (TA/900603) (David Jarvis Associates)



6.3 Methodology

This ecological assessment has been prepared for the proposed development at the Breedon quarry at Killaskillen, following a thorough desktop review of previous ecological information and field surveys carried out at the study area and other ecological information from the general area. The survey schedule is summarised in Table 6.2.

The methodology employed in the carrying out of this ecological assessment is outlined below.

6.3.1 Desktop Review

A desktop review of relevant data available for the study area was undertaken reviewing previous ecological surveys from the quarry site as well as other relevant information (*e.g.,* online ecology and environmental databases).

The National Parks and Wildlife Service (NPWS), National Biodiversity Data Centre (NBDC) and Botanical Society of Britain and Ireland (BSBI) online databases were consulted to identify any rare, protected and non-native invasive species located within the relevant national 10km and 2km grid squares surrounding the proposed development site.

The model of Bat Landscapes, available on the NBDC website was consulted. This model is based on the relative importance of landscape and habitat associations for bat species in Ireland and the index ranges from 0 to 100, where 100 is the most suitable for bats (Lundy *et al*. 2011).

Previous ecological reports commissioned by Breedon Quarry including the Biodiversity Chapter of the 2009 EIAR (TA/900603), Breedon Quarry's Biodiversity Plan (Openfield Ecology 2009) and Bat Management Plan (Keeley 2018) were consulted for information concerning previous habitat, botanical and faunal surveys. The Ecological Impact Assessment Report (EcIA) and screening statement produced by Enviroguide Consulting (2022) for the proposed Solar Farm within the Breedon landholding, located to the northeast of the application site was also reviewed.

6.3.2 Designated Conservation Sites

Designated nature conservation sites within the wider hinterland of the proposed development site were identified through a desktop review and by GIS analysis. Nature Reserves and Refuges for Fauna are protected under the Irish Wildlife Acts (1976-2010). Designated conservation sites include national sites, Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs). While NHAs are legally protected by the Irish Wildlife Acts (1976 - 2010), pNHAs are not.

European sites, Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) have been designated under the EU Habitats Directive (92/43/EEC) and the EU Birds Directive (2009/147/EC) respectively. SACs and SPAs are collectively known as Natura 2000 sites and are legally protected by Irish law. Many designated sites overlap, *e.g*., a site can be designated as both a SAC and NHA.

There are no Natura 2000 sites located within 5km of the application site boundary. A screening appraisal report was also prepared in support of the Appropriate Assessment (AA) process. The main purpose of this report was to identify whether likely significant effects on

any Natura 2000 site are likely to arise from the proposed development. The conservation objectives of Natura 2000 sites (*i.e.*, habitats and species for which the sites are selected) are referred to when carrying out appropriate assessments for plans and projects that might impact on these sites.

The outcome of the screening stage assessment is outlined in Section 6.4 with the Screening Assessment report submitted to accompany the planning application. Details of distances to designated sites, conservation objectives *etc*. are also provided in the Screening Report which accompanies this planning application.

Table 6.2: Baseline field assessment details – 2022.

Date	Time	Weather	Ecologist	Task
28/01/2022	14.00 – 16:00	Overcast, Dry, Wind F3, Cloud 8/8 Visibility Good	Gavin Fennessy	Baseline ecological survey.
28/02/2022	11:00 – 17:00	Dull and Overcast, Dry, Wind F1-2, Cloud 8/8, Visibility Good	Gavin Fennessy	Baseline ecological survey including the deployment of bat detectors and remote cameras
30/03/2022	10:00 – 15:00	Sunny, Dry, Wind F3, Cloud 3/8, Visibility Good	Gavin Fennessy	Baseline ecological surveys, Redeployment of bat detector and cameras.
08/04/2022	10:00 – 16:00	Dry, Wind F2, Cloud 6/8, Visibility Good	John Deasy	Baseline surveys including habitat and botanical surveys and walkovers of riverbanks, collection of bat detector and cameras.

6.3.3 Habitat & Botanical Assessment

The habitat and botanical assessment was carried out Dr. John Deasy on 8th April 2022 in accordance with best practice guidance (Smith *et al.* 2011). The main purpose of the habitat/vegetation survey was to describe the habitats/vegetation present and to assess their ecological value. The survey area comprised the application site and the immediate surrounding active quarry area. The majority of the surrounding land is dominated by a mixture of Spoil and bare ground (ED2) and Recolonising bare ground (ED3).

The survey involved a walkover of the proposed application site where the habitats present were classified to level three using the classification scheme presented in *A Guide to Habitats of Ireland* (Fossitt, 2000). The extent of habitats was recorded on a field map along with notes of species present and their relative abundance described using the DAFOR scale. In addition,

any other observations of interest (*e.g.*, invasive plant species) were recorded using a Garmin eTrex10 GPS handheld unit. Evaluation of the habitats present in terms of their ecological value was assessed using the Biodiversity Evaluation Scheme presented in Appendix B (amended National Roads Authority 2009 scheme to include watercourse/aquatic evaluation elements from Nairn and Fossitt, 2004).

6.3.4 Mammal Assessment

6.3.4.1 Non Volant Mammals

Surveys included walkovers of the quarry site (January to April 2022), identifying mammal species or signs of mammal activity seen (*e.g.*, droppings, tracks, burrows etc.) and recording observations using field notes and/or a handheld GPS unit. Techniques used to identify mammal activity followed recognised guidelines (*e.g.*, Clark 1988, Sutherland 1996, Bang & Dahlstrom 2004 and JNCC 2004).

In addition, six digital trail cameras (Camera-traps) which take photographs and/or video when triggered by heat or motion, were also deployed to record mammal activity within the study area. In total, six trail cameras were erected at, and in the vicinity of the site between 28th February and 8th April 2022 inclusive. The locations of equipment deployed is shown in Figure 6.3.

The conservation status of mammal species was considered. The conservation status of mammals within Ireland and Europe is indicated by inclusion in one or more of the following: Irish Wildlife Acts (1976 - 2010); Red List of Terrestrial Mammals (Marnell *et al.* 2009); EU Habitats Directive.

6.3.4.2 Bat Assessment

An ultrasonic detector survey was carried out within the survey area. Two detectors were placed on site. The first was placed between 28th February and 8th April 2022. The second was placed between 28th February and 30th March 2022. The purpose of this survey was to record bat activity in the area from which information on species composition, relative abundance and landscape usage could be derived. Two Wildlife Acoustics SM4 full-spectrum bat detectors were deployed (Figure 6.3). Species identification was aided by post hoc sonogram analysis using Wildlife Acoustics' Kaleidoscope Professional software (v. 5.1.9g).

The conservation of bat species was considered. All Irish bat species and their breeding, roosting and resting locations are legally protected under both the Irish Wildlife Acts (1976-2010) and as Annex IV species in the EU Habitats Directive (92/43/EEC).

6.3.5 Bird Assessment

All bird species seen or heard at the site during the site walkover surveys between January and April 2022 were noted. Any behaviours indicative of breeding or roosting on or in the vicinity of the site were recorded.

The avian community in the wider locality was assessed based on a detailed desktop review of available data for the study area, including the NBDC online database and Bird Atlas 2007–2011. The conservation status of bird species was assessed with reference to; EU Birds

Directive (2009/147/EC) Annex I list and Birds of Conservation Concern in Ireland; (BoCCI) Red, Amber and Green list (Gilbert *et al*., 2021). On the BoCCI list; Red-listed species are of high conservation concern in Ireland, Amber-list are considered of medium conservation concern, while Green-listed species are not of conservation concern in Ireland at present. Bird species listed on Annex I of the EU Birds Directive are considered of high conservation concern across Europe.

6.3.6 Other Taxa Assessment

Other taxa encountered during the general baseline walkovers were recorded. The conservation status of other taxa was assessed by examining their inclusion in one or more of the following: Irish Wildlife Acts (1976–2010); Irish Red List for Butterfly (Regan *et al*. 2010); Irish Red List for Damselflies & Dragonflies (Nelson *et al*. 2011); Irish Red List for Amphibians, Reptiles & Freshwater Fish (King *et al*. 2011); Regional Red List of Irish Bees (Fitzpatrick *et al*. 2006); and the EU Habitats Directive.

Figure 6.3: Passive bat detector and trail camera survey locations.

6.4 Results

The following sections detail the results of the desktop and field surveys which are used to inform the ecological impact assessment.

6.4.1 Designated Conservation Sites

The application site is not located within any designated Natura 2000 sites or nationally designated conservation sites. There are four Natura 2000 sites, five NHA sites and five pNHA sites located within 15km of the applications boundary (Table 6.3; Figure 6.4 and Figure 6.5). The conservation objectives of the Natura 2000 sites are outlined in Table 6.4 and the features of interest of the NHA and pNHA sites are outlined in Table 6.5.

The most proximate Natura 2000 site is Mount Hevey Bog SAC (002342), located 5.3km to northwest of the application site. There is no potential impact-receptor pathway connecting the proposed extension to the limestone quarry to this designated site.

The likely significant effects on European designated sites arising from the proposed development are addressed in the accompanying Screening Report in support of the AA process.

Table 6.3: Designated conservation sites within 15km of the application boundary.

Designated Site Name	Site Code	Minimum Distance (km)
Natura 2000 sites		
Mount Hevey Bog SAC	002342	5.3
River Boyne and River Blackwater SAC	002299	8.0
River Boyne and River Blackwater SPA	004232	8.0
Wooddown Bog SAC	002205	12.7
Nationally Designated Sites		
Milltownpass Bog NHA	002323	5.3
Mount Hevey Bog pNHA	001584	5.3
Royal Canal pNHA	002103	6.4
Black Castle Bog NHA	000570	7.0
Molerick Bog NHA	001582	9.0
Grand Canal pNHA	002104	10.5
Ballynabarny Fen pNHA	001573	11.4
Wooddown Bog NHA	002205	12.7
Ballina Bog pNHA	000390	12.9
Carbury Bog NHA	001388	13.3

Table 6.4: Summary of designated Natura 2000 Sites of relevance to the current proposed development.

Site Name & Code	Conservation Summary	Minimum Distance from Site (km)
Mount Hevey Bog SAC 002342	The Conservation Objectives of this SAC are to maintain or restore the favourable conservation condition of the following qualifying interests **Habitat:** • Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the *Rhynchosporion* [7150] (after NPWS 2016)	5.3 km
River Boyne and River Blackwater SAC 002299	The Conservation Objectives of this SAC are to maintain or restore the favourable conservation condition of the following qualifying interests **Habitats:** • Alkaline fens [7230] • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] **Species:** • *Lampetra fluviatilis* (River Lamprey) [1099] • *Salmo salar* (Salmon) [1106] • *Lutra lutra* (Otter) [1355] (after NPWS 2021)	8.0 km
River Boyne and River Blackwater SPA 004232	The Conservation Objectives of this SPA are to maintain or restore the favourable conservation condition of the following qualifying interests **Species:** • Kingfisher (*Alcedo atthis*) [A229] (after NPWS 2022)	8.0 km
Wooddown Bog SAC 002205	The Conservation Objectives of this SAC are to maintain or restore the favourable conservation condition of the following qualifying interests **Habitats:** • Degraded raised bogs still capable of natural regeneration [7120] (after NPWS 2022)	12.7 km

Table 6.5: Summary of nationally designated conservation sites closest to the application site boundary.

Site Name & Code	Conservation Summary	Minimum Distance from Site (km)
Milltownpass Bog NHA 002323	Milltownpass Bog NHA is located 1 km north-east of Milltownpass, in the townlands of Pass of Kilbride and Claremount or Cummingstown in Co.Westmeath. The site comprises a raised bog that includes both areas of high bog and cutover bog and can be accessed from the local road off the N6 to the east of the site. Milltownpass Bog NHA is a site of considerable conservation significance comprising as it does a raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. This site supports a good diversity of raised bog microhabitats, including hummocks and pools and due to its easterly location, is of biogeographical importance. Ireland has a high proportion of the total E.U. resource of raised bog (over 50%) and so has a special responsibility for its conservation at an international level.	5.3 km
Mount Hevey Bog pNHA 001584	Mount Hevey Bog is a medium sized lowland raised bog located 4 km northeast of Kinnegad. It is fairly wet and has some areas with a hummock and hollow surface topography. The hummocks and hollow communities comprise of Bog Mosses (*Sphagnum* spp.), White Beaked Sedge (*Rhynchospora alba*), Bog Cotton (*Eriophorum angustifolium*), Sundews (*Drosera* spp.), Bog Rosemary (*Andromeda polifolia*) and an abundant cover of lichens (*Cladonia arbuscula*). The drier areas were characterised by Heather (*Calluna vulgaris*), Cross-leaved Heath (*Erica tetralix*), Bog Asphodel (*Narthecium ossifragum*) and Deer Grass (*Scirpus cespitosus*). Birch (*Betula pubescens*) is colonising the bog edges in places, representing a more natural bog margin than the encircling conifers.	5.3 km
Royal Canal pNHA 002103	The Royal Canal is a man-made waterway linking the River Liffey at Dublin to the River Shannon near Tarmonbarry. There is a branch line from Kilashee to Longford Town. The canal NHA comprises the central channel and the banks on either side of it. The main water supply is from Lough Owel (also an NHA) via a feeder channel into the canal at Mullingar. The Royal Canal was closed to navigation in 1961. The section of canal west of Mullingar was allowed to dry out, and the eastern section silted up and became overgrown. The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods.	6.4 km
Black Castle Bog NHA 000570	Black Castle Bog NHA is situated approximately 8 km north-west of Edenderry, mainly in the townlands of Clonmore, Ballyheashill and Ballymacwilliam in County Meath. The site comprises a raised bog that includes both areas of high bog and cutover bog. The north-western margins of the site are bounded by roads and those on the south-east are bounded mainly by scrub and woodland.	7.0 km

Site Name & Code	Conservation Summary	Minimum Distance from Site (km)
	Black Castle Bog NHA is a site of considerable conservation significance, comprising as it does, a raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. It is especially important because of its eastern location. This site also supports a wide range of habitats, especially associated with the cutover areas. Ireland has a high proportion of the total E.U. resource of raised bog (over 50%) and so has a special responsibility for its conservation at an international level.	
Molerick Bog NHA 001582	Molerick Bog NHA is situated approximately 4 km south-west of Longwood in the townlands of Molerick, Anneville and Blackshade Co. Meath. The site comprises a raised bog that includes both areas of high bog and cutover bog. The site is bounded by the Dublin-Sligo railway line to the north and local roads to the east. Molerick Bog NHA is a site of conservation significance comprising as it does a raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. This site is located in Co. Meath at the eastern extreme of raised bogs in Ireland and is one of only four raised bogs in the county. Ireland has a high proportion of the total E.U. resource of this habitat type (over 50%) and so has a special responsibility for its conservation at an international level.	9.0 km
Grand Canal pNHA 002104	The Grand Canal is a man-made waterway linking the River Liffey at Dublin with the Shannon at Shannon Harbour and the Barrow at Athy. The Grand Canal Natural Heritage Area (NHA) comprises the canal channel and the banks on either side of it. The canal system is made up of a number of branches - the Main Line from Dublin to the Shannon, the Barrow Line from Lowtown to Athy, the Edenderry Branch, the Naas and Corbally Branch and the Milltown Feeder. The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods.	10.5 km
Ballynabarny Fen pNHA 001573	This fen lies in a small, deep, artificially-created valley between the embankments of the Royal Canal and the nearby railway, and is situated about 3km west-north-west of Longwood. Ballinabarny Fen contains a good floral representation of a fen community. This habitat is relatively uncommon, and the presence of Variegated Horsetail (*Equisetum variegatum*) is a bonus. The adjacent canal adds habitat diversity to the site.	11.4 km
Ballina Bog pNHA 000390	Ballina Bog is situated about 8 km west of Enfield and just south-west of Moyvally in an elongated valley. Despite the presence of many drains, the condition of the vegetation and surface makes this bog of considerable scientific importance. It is one of the most easterly raised bogs which is relatively intact.	12.9 km

Site Name & Code	Conservation Summary	Minimum Distance from Site (km)
Carbury Bog NHA 001388	Carbury Bog NHA is situated 4 km north of Carbury, almost entirely within the townlands of Ardkill, Carbury and Knockcor, County Kildare. Carbury Hill, which rises to 142 m, lies directly south of the bog. This site originally consisted of two lobes but much of the large north-west lobe is actively cutover and has been excluded from the site. Carbury Bog NHA is a site of considerable conservation significance comprising of raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. This site supports a good diversity of raised bog microhabitats including some hummock/hollow complexes, scrub and marginal deciduous woodland which add to the diversity and scientific value of the site.	13.3km

Figure 6.4: Natura 2000 sites located in the 15km hinterland of the application site at Breedon Quarry.

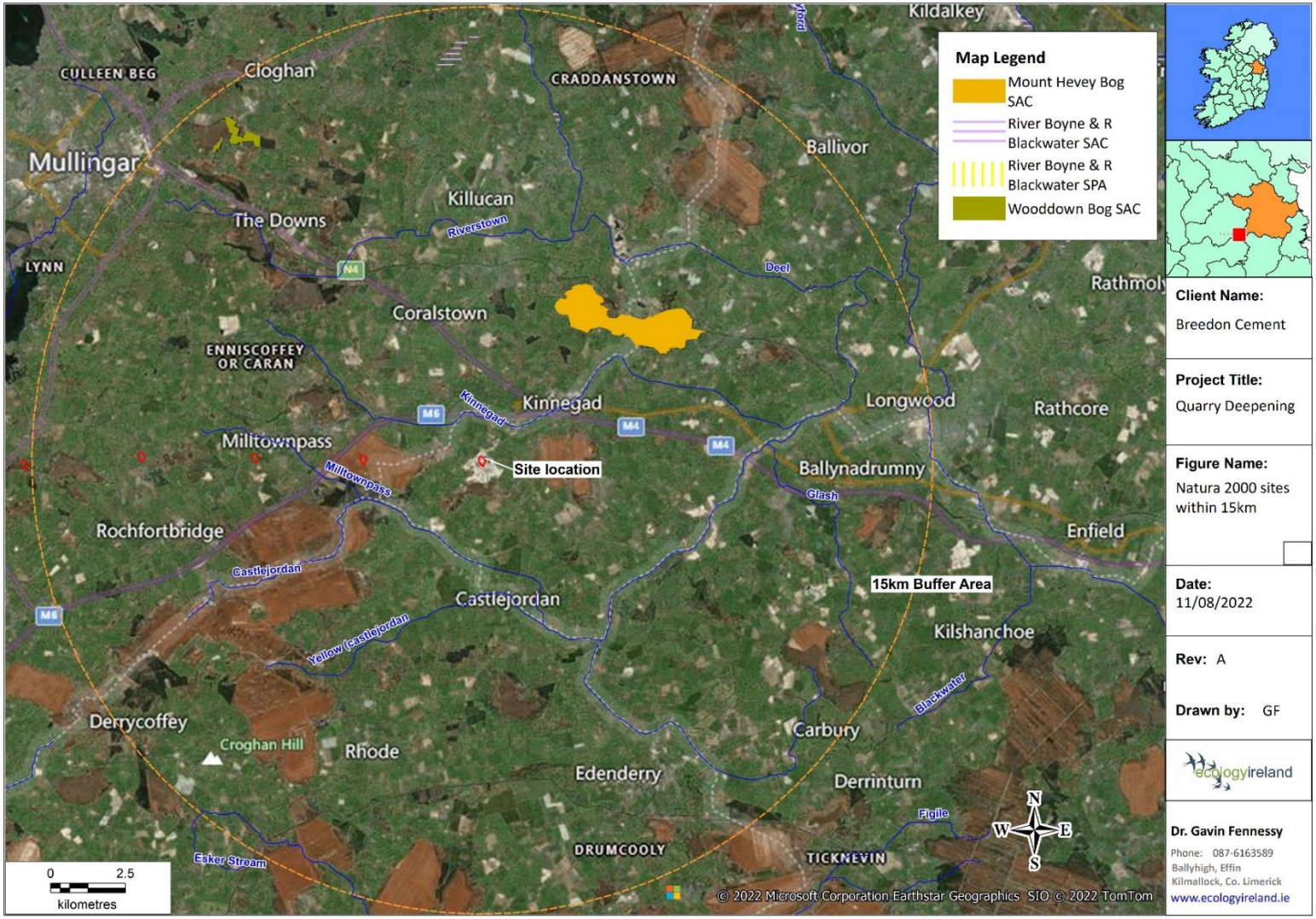
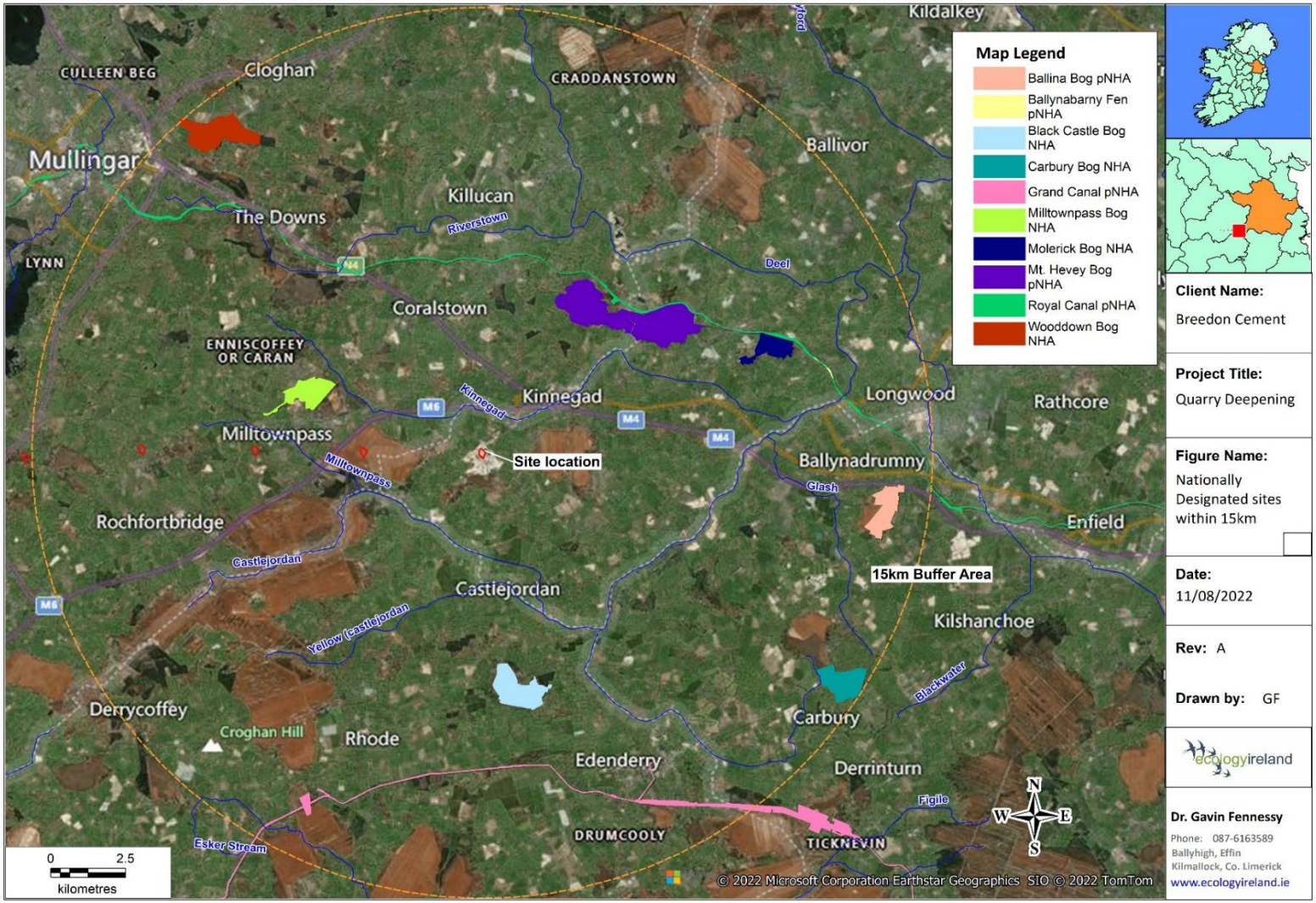


Figure 6.5: Nationally designated conservation sites within 15km hinterland of the application site boundary at Breedon Quarry.



6.4.2 Hydrological connectivity

As outlined in Section 6.1.2, there are no watercourses within the boundary of the application site. The nearest watercourses to the application site are the tributaries of the Kinnegad River (*c.* 1.3km north), the Killaskillen Stream (*c.* 650m northeast) and the Baltigeer Stream (*c.* 1.1km west). The water management system for the quarry does not direct excess (stored/treated) water to these two watercourses and as such it is considered that these streams do not form a hydrological pathway linking the application site to any designated site. As outlined in Chapter 8 of this EIAR, it is considered that the nature of these streams is such that they act essentially as field drains that transmit rainfall runoff from the agricultural farmland that the streams bound.

Under the IE License P0487-07, the quarry currently discharges water to the Kinnegad River. The water management system in place at the site is made up of several connected sumps and settlement ponds. In the existing limestone quarry rainfall-runoff, including from the application site and any groundwater ingress that collects in the sump is removed by pumping to the cement plant to be re-used or released as steam, to the balancing pond and to the terrace sump which provides additional storage for the balancing pond. Water stored in the balancing pond outflows to the Settlement Pond 1 (volumetric capacity of *c.* 35,000m^3). This settlement pond also receives pumped water from the shale quarry sump and treated effluent from the onsite wastewater treatment plant (WWTP). The outflow of Settlement Pond 1 enters Settlement Pond 2 (volumetric capacity of *c.* 70,000m^3) via a hydrocarbon interceptor. The outfall from Settlement Pond 2 discharges to the Kinnegad River via the primary site discharge point (SW1).

The Kinnegad River flows into the Boyne River *c*. 12.8km downstream of the landholding. The Boyne River forms part of the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA. Therefore, a distant hydrological pathway connecting the quarry site and these Natura 2000 sites (via surface water discharge to the Kinnegad River) exists. There are no direct hydrological links between the proposed site and any of the other designated sites situated within 15km of the proposed development.

The local hydrology and hydrogeology are described in detail in Chapter 8 (Water) of the EIAR.

6.4.3 Botanical & Habitat Survey

The habitats and vegetation which occur within the application site are generally considered to be of relatively low botanical value. The habitats which occur have a low botanical diversity and are considered to be common and widespread throughout Ireland (Fossitt 2000).

No habitats listed on Annex I of the EU Habitats Directive were recorded within the proposed development site boundary.

Botanical species protected under the Flora (Protection) Order 2022, listed in Annex II or IV of the EU Habitats Directive (92/43/EEC), or Red listed in Ireland (Wyse-Jackson *et al*., 2016) were not recorded during the site visits.

The habitats which occur would not be considered to provide likely habitat for any rare plant species (Curtis and McGough, 1988). In many areas of Ireland quarry areas are known to support areas of the priority Annex I grassland habitat type [6210] Orchid-rich calcareous

grassland, however the geology of the quarry is not sufficiently calcareous to support a species-rich, calcareous grassland flora.

The main habitats occurring within the survey area are outlined in the following sections. A map which shows the distribution of habitats within the survey area is presented in Figure 6.6. The following habitats (with Fossitt codes, as outlined in Section 6.3.3 above) were recorded within the proposed development site study area (See Figure 6.6):

- Active quarries and mines (ED4)
- Spoil and bare ground (ED2)
- Recolonising bare ground (ED3)
- Scrub/Dry meadow and grassy verge mosaic (WS1/GS2)

6.4.3.1 Active quarries and mines (ED4)

This habitat was recorded on the quarry floor where quarry operations have left the quarried rock exposed and almost unvegetated. During the site visit, stockpiles of aggregates were being temporarily stored on the quarry floor. The sides of the active quarry consisted of near vertical rock and soil faces.

The ecological valuation of the active quarry habitat is considered to be of local importance (lower value).

Plate 6.1: Active quarry habitat within the application site.

6.4.3.2 Spoil and bare ground (ED2)

This habitat was recorded on the access track that ran around the southwestern, western and northern rim of the active quarry and consisted of a track *c*. 3-4 m wide which was frequently used by vehicles and so maintained unvegetated due to disturbance and regular maintenance. The habitat was also recorded along a section of the safety bank running around the rim of the quarry. This had been recently modified and as a result, no vegetation was growing on it.

The ecological valuation of the spoil and bare ground habitat is considered to be of local importance (lower value).

Plate 6.2: Spoil and bare ground habitat within the application site.

6.4.3.3 Recolonising bare ground (ED3)

This habitat was recorded on the less disturbed or trafficked areas around the edge of the quarry and consisted of exposed quarry spoil or aggregates which were being recolonised by ruderal and early colonising species. Species present included frequent Mouse-ear Hawkweed (*Pilosella officinarum*) along with occasional Yarrow (*Achillea millefolium*), Red Clover (*Trifolium pratense*), Coltsfoot (*Tussilago farfara*) and sedge (*Carex* sp.). Daisy (*Bellis perennis*), Cocksfoot (*Dactylis glomerata*) and Dandelion (*Taraxacum* agg.) were rarely recorded. A range of saplings such as Scots Pine (*Pinus sylvestris*), Willow (*Salix* sp.), Birch (*Betula* sp.) and Hawthorn (*Crataegus monogyna*) seedlings and saplings were becoming established in the open bare ground. The habitat was also recorded on the less frequently disturbed safety bank running around the rim of the active quarry.

The ecological valuation of the recolonising bare ground habitat is considered to be of local importance (lower value).

Plate 6.3: Recolonising bare ground habitat within the application site.

6.4.3.4 Scrub/Dry meadows and grassy verges mosaic (WS1/GS2)

This habitat was recorded growing on the less frequently disturbed safety bank running around the rim of the active quarry. False Oat-grass (*Arrhenatherum elatius*), Rosebay Willowherb (*Chamaenerion angustifolium*), Willowherb (*Epilobium* sp.) and Nettle (*Urtica dioica*) were frequently recorded. Yorkshire Fog (*Holcus lanatus*), Creeping Bent (*Agrostis stolonifera*), Ribwort Plantain (*Plantago lanceolata*), Coltsfoot, Common Vetch (*Vicia sativa*) and Bramble (*Rubus fructicosus* agg.) were occasionally recorded. Bush Vetch (*Vicia sepium*), Meadow Buttercup (*Ranunculus acris*), Creeping Buttercup (*Ranunculus repens*), Cleavers (*Galium aparine*), Broad-leaved Dock (*Rumex obtusifolius*), Common Field Speedwell (*Veronica persica*), Lesser Burdock (*Arctium minus*) and Barren Strawberry (*Potentilla sterilis*) were rarely recorded. A range of woody species including sapling and immature Willow, Elder (*Sambucus nigra*), Sycamore and Ash (*Fraxinus excelsior*) were recorded growing in the habitat. The grassland element of the habitat was unmanaged with a long and rank sward.

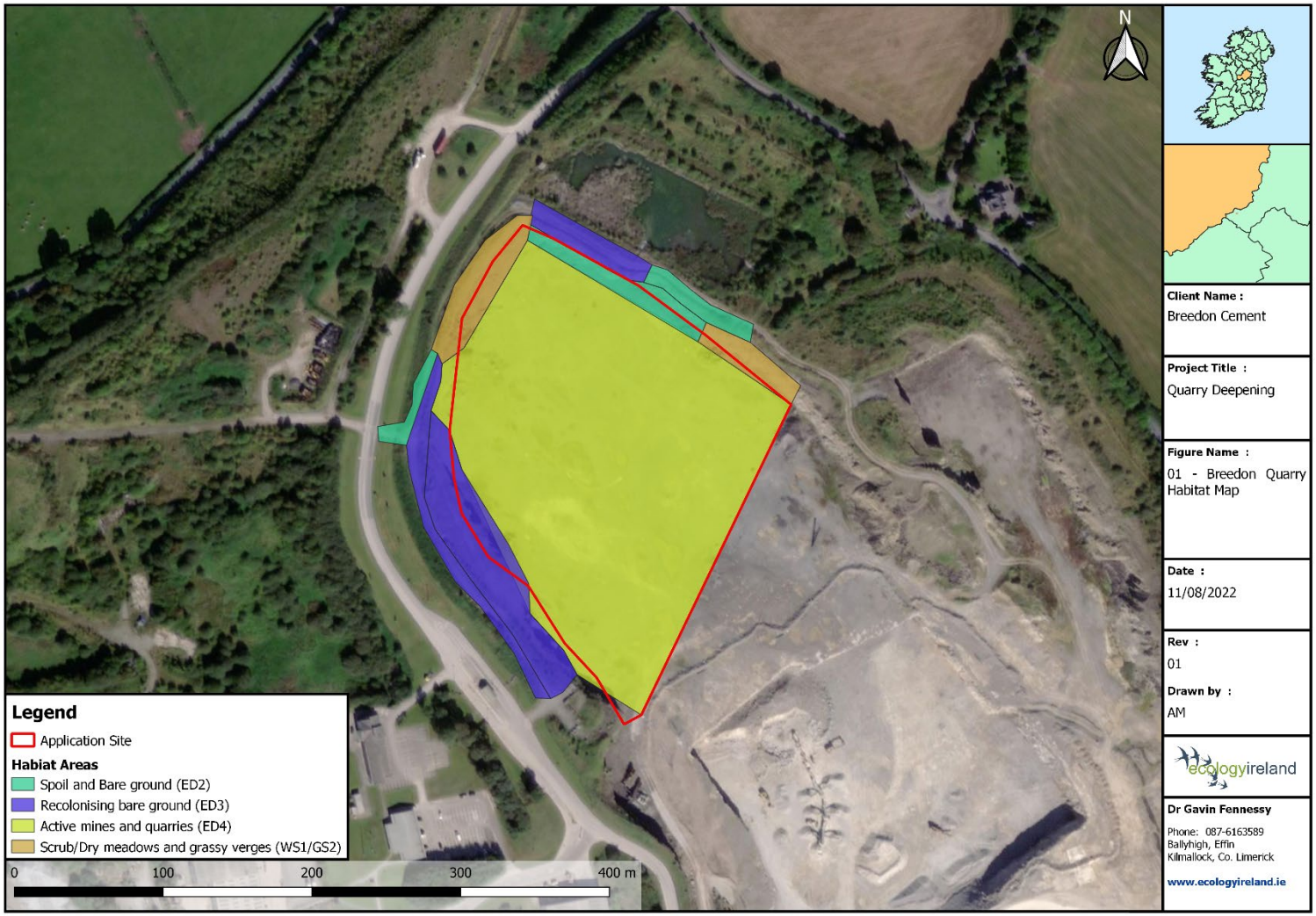
The ecological valuation of the scrub/dry meadows and grassy verge habitat is considered to be of local importance (lower value).

Plate 6.4: Scrub/Dry meadows and grassy verges within the application site.

6.4.3.5 Invasive Species

No non-native invasive plant species were recorded within the proposed development study area during the baseline survey.

Figure 6.6: Habitat map of application site and adjoining areas.



6.4.4 Mammal Assessment

The faunal usage of the study area (*i.e.* application site and surrounding area) was assessed from desktop sources in combination with field surveys, including the deployment of wildlife trail cameras and passive bat detectors.

6.4.4.1 Non-volant Mammals

Other than two sightings of Irish hare*, Lepus timidus hibernicus,* there were no direct sightings made of any other mammal species during the walkover of the study area. Irish hare was observed on the active quarry floor during the site walkover and at the edge of the car park at the offices on site in February 2022. Hare droppings were also recorded north of the application site boundary during the February and March 2022 site visits.

Fox scat was observed around the pond to the north of the study area, outside of the application boundary with signs of digging around the area.

Otter spraint was observed north of the application site near the primary discharge point (SW1) to the Kinnegad River on April 8th, 2022. No couches, or holts were recorded during a walkover of the riverbank on the same survey occasion.

Trail camera analysis showed many records of Fox, *Vulpes vulpes*. This species was recorded on all 6 trail cameras with numerous records for each. Results of trail camera analysis can be seen below in Table 6.6 along with other species that were recorded. Examples of species recorded by the trail cameras can be seen in Plate 6.5 to Plate 6.7 below.

Six legally protected non-volant mammal species have been recorded in the 10km grid square in which the application site is located (N54 NBDC). These are - Otter, *Lutra lutra*, Badger, *Meles meles*, Pine marten *Martes martes*, Hedgehog, *Erinaceus europaeus,* Red squirrel, *Sciurus vulgaris* and Fallow deer *Dama dama.*

Surveys carried out to inform the ecological assessment of the 2009 planning application for an extension to the quarry recorded several Badger setts (believed to be of one social group) within the landholding (Ecological Solutions 2009). A number of these burrows were subsequently closed under licence. Measures to protect remaining setts were also put in place. The 2009 EIS noted Badger droppings on site and a sighting of Irish Hare.

During analysis of the bat detector data the presence of the mammal Greater White-toothed shrew, *Crocidura russula* was also confirmed.

Table 6.6: Trail camera analysis.

Common Name	Scientific Name	Cam 1	Cam 2	Cam 3	Cam 4	Cam 5	Cam 6
Bird species							
Blackbird	*Turdus merula*		2	3		16	
Chaffinch	*Fringilla coelebs*					1	
Dunnock	*Prunella modularis*			3			
Fieldfare	*Turdus viscivorus*					1	
Hooded Crow	*Corvus cornix*		1			1	
Magpie	*Pica pica*					2	
Meadow Pipit	*Anthus pratensis*			1			
Moorhen	*Gallinula chloropus*			1			
Pheasant	*Phasianus colchicus*				1	6	
Redwing	*Turdus iliacus*					3	
Robin	*Erithacus rubecula*			8		13	
Snipe	*Gallinago gallinago*			7			
Water Rail	*Rallus aquaticus*			1			
Woodpigeon	*Columba palumbus*					10	
Non-volant Mammals							
Badger	*Meles meles*		1				
Cat	*Felis catus*			1		3	1
Field Mouse	*Apodemus sylvaticus*			3			
Fox	*Vulpes vulpes*	3	6	1	1	22	2
Irish Hare	*Lepus timidus hibernicus*					1	
Unidentified small mammal				4	1		

Plate 6.5: Fox recorded on trail camera footage

Plate 6.6: Water Rail recorded on trail camera footage

Plate 6.7: Moorhen recorded on trail camera footage

6.4.4.2 Bats

A visual inspection was completed to assess the potential study area to support bat roosts. No features likely to support roosting bats were located within the application site or surrounding lands. The ponds, fringing scrub and trackways within the greater quarry area all have potential for foraging and commuting bats.

Passive bat detectors were deployed in locations likely to attract bats such as trees and hedgerows. Bats forage and commute using hedgerow corridors and woodland. Bat activity is influenced by weather conditions as heavy rain, strong winds and low temperatures create suboptimal foraging conditions.

Analysis of the passive bat detector registrations confirmed the presence of five bat species (Table 6.7). Common Pipistrelle, *Pipistrellus pipistrellus* and Soprano Pipistrelle, *Pipistrellus pygmaeus* were the most commonly recorded species. Common Pipistrelle accounted for 48% of all registrations. This species was recorded in large numbers on both detectors. Daubenton's Bat was recorded at both deployment locations, and it would be expected that the ponds would provide some very suitable foraging habitat for this species in particular. The level of activity was regarded as relatively low, for the time of year (end of February until early April).

Of the two survey locations Detector 1 recorded the most activity: 460 registrations were recorded at Detector 1 with 357 registrations recorded at Detector 2 (See Table 6.7). Overall, the level of bat activity at the application site was regarded as relatively low. The application site has habitats that generally present suboptimal foraging habitat for bats and a low to moderate diversity of bat species was recorded utilising the area.

Four species of bats have been recorded in the 10km grid squares in which the proposed site is located (N54; NBDC), namely Daubenton's bat, *Myotis daubentonii,* Brown Long-eared Bat *Plecotus auritus*, Pipistrelle, *Pipistrellus pipistrellus sensu lato* and Soprano Pipistrelle, *Pipistrellus pygmaeus*. Bat surveys carried out to inform the ecological assessment of the 2009 planning application for the extension of the quarry recorded the presence on site of Common and Soprano Pipistrelle as well Leisler's Bat. There was some evidence in July 2009 of a roosting Brown Long-eared Bat in one of the old derelict buildings present (Kelleher 2009). Subsequently, bat boxes were erected at the site and a bat management strategy has been developed to enhance the existing habitats for foraging and roosting bats (Keeley 2018). Surveys in 2018 recorded the presence of Leisler's Bat as well as Common and Soprano Pipistrelle. It also noted that Daubenton's Bat had previously been recorded at the site (Keeley 2018).

Table 6.7: Number of bat registrations recorded at the two monitoring stations at the Breedon Quarry Site (February-April 2022).

Bat species	Scientific Name	Detector 1	Detector 2	Total
Daubenton's Bat	*Myotis daubentonii*	14	17	31
Natterers Bat	*Myotis nattereri*	3		3
Leisler's Bat	*Nyctalus leisleri*	83	36	119
Common Pipistrelle	*Pipistrellus pipistrellus*	185	211	396
Soprano Pipistrelle	*Pipistrellus pygmaeus*	165	84	249
40/50kHz Pipistrelle	*Pipistrellus sp.*	10	5	15
Myotis sp.	*Myotis sp.*		4	4

6.4.5 Avian Assessment

Table 6.8 summarises the bird species recorded at the site during the field survey visits between January 2022 and April 2022. In total, 44 bird species were recorded in the study area. Table 6.8 also shows the current Birds of Conservation Concern in Ireland (BoCCI) status (Gilbert *et al*. 2021).

There is a lack of vegetative cover throughout the application site as it is located within an active quarry and there are no natural habitats present. Therefore, transects and point counts were considered to be unsuitable and unnecessary to evaluate the birds present at the application site. There was lack of cover and feeding opportunities for birds within the study area. Only two species were observed on the ground within the boundary of the application site during all four site visits. These species were Hooded crow, *Corvus cornix* and Pied wagtail, *Motacilla alba*. In general, there were low levels of commuting bird activity within the overall quarry site. Several of the survey visits were carried out outside of the bird breeding season. If surveys were carried out across the summer period it is likely that some additional species such as House Martin, *Delichon urbicum* and Willow Warbler, *Phyllscopus trochilus* would likely be recorded locally. However, given the lack of attractive habitat present within the application site, very few species would be recorded at rest within the application site.

In the past, Kingfisher has been recorded in the Kinnegad River (NBDC; EIS 2009). Kingfisher was not observed, and no breeding burrows were present along the nearby sections of the Kinnegad River when surveyed in April 2022.

Five of the bird species recorded in the overall study area during the site surveys are on the BoCCI Red-list; Grey Wagtail, *Motacilla cinerea*, Kestrel, *Faclo tinnunculus*, Meadow Pipit, *Anthus pratensis*, Redwing, *Turdus iliacus* and Snipe, *Gallinago gallinago.* Kestrel have suffered declines in breeding population in recent decades and are currently of conservation concern across their European range. Meadow Pipit, while still a fairly common and widespread species has suffered similar declines, but over a shorter timeframe and is considered to be of global wide conservation concern. Meadow Pipit are ground nesting birds that are found in a wide variety of habitats from farmland to upland heath and bog. 12 Amber-list species were also recorded during the site walkover.

A pair of Peregrine Falcon, *Falco peregrinus* were observed within the study area during the March and April site visits. Peregrine Falcons, listed on Annex I, frequently nest and roost at active quarries. They use the steep rock faces to nest and roost and are tolerant of the movement of quarry plant. Sand Martins, *Riparia riparia* were recorded within the study area as casual observations. They are known to breed locally (within the landholding). Two Kestrel chicks that had fallen out of their nest were found on site by Breedon staff in July 2022. They were transported to a nearby wildlife facility for care. The 2022 EcIA for the proposed solar farm to the northeast recorded Kestrel flying over the proposed solar farm site.

The historic bird data previously recorded in the 2km grid squares in which the application site is located N54R; NBDC) describes a relatively diverse avian community (See Table 6.9). A total of 45 species have been recorded.

Table 6.8: Avian species encountered (seen or heard) during walkovers of the quarry site in 2022.

Bird Species	Scientific Name	BoCCI Status
Blackbird	*Turdus merula*	Green-listed
Blackcap	*Sylvia artricapilla*	Green-listed
Black-headed Gull*	*Chroicocephalus ridibundus*	Amber-listed
Blue Tit	*Cyanistes caeruleus*	Green-listed
Buzzard	*Buteo buteo*	Green-listed
Chaffinch	*Fringilla coelebs*	Green-listed
Chiffchaff	*Phylloscopus collybita*	Green-listed
Coal Tit	*Periparus ater*	Green-listed
Coot*	*Fulica atra*	Amber-listed
Cormorant*	*Phalocrocorax carbo*	Amber-listed
Dunnock	*Prunella modularis*	Green-listed
Feral Pigeon	*Columba livia*	Green-listed
Goldfinch	*Carduelis carduelis*	Green-listed
Grey Heron	*Ardea cinerea*	Green-listed
Grey Wagtail^	*Motacilla cinerea*	Red-listed

Bird Species	Scientific Name	BoCCI Status
Herring Gull*	*Larus argentatus*	Amber-listed
Hooded Crow	*Corvus cornix*	Green-listed
Kestrel^	*Falco tinnunculus*	Red-listed
Lesser Redpoll	*Acanthis cabaret*	Green-listed
Linnet*	*Linaria cannabina*	Amber-listed
Little Egret	*Egretta garzetta*	Green-listed
Little Grebe	*Tachybaptus ruficollis*	Green-listed
Magpie	*Pica pica*	Green-listed
Mallard	*Anas plathrhynchos*	Green-listed
Meadow Pipit^	*Anthus pratensis*	Red-listed
Moorhen	*Gallinula chloropus*	Green-listed
Mute Swan*	*Cygnus olor*	Amber-listed
Peregrine Falcon	*Falco peregrinus*	Green-listed
Pheasant	*Phasinaus colchicus*	Green-listed
Pied Wagtail	*Motacilla alba*	Green-listed
Redwing^	*Turdus iliacus*	Red-listed
Reed Bunting	*Emberiza schoeniclus*	Green-listed
Robin	*Erithacus rubecula*	Green-listed
Rook	*Corvus frugilegus*	Green-listed
Sand Martin*	*Riparia riparia*	Amber-listed
Skylark*	*Alauda arvensis*	Amber-listed
Snipe^	*Gallinago gallinago*	Red-listed
Starling*	*Sturnus vulgaris*	Amber-listed
Stonechat	*Saxicola torquata*	Green-listed
Swallow*	*Hirundo rustica*	Amber-listed
Teal*	*Anas crecca*	Amber-listed
Wigeon*	*Anas penelope*	Amber-listed
Woodpigeon	*Columba palumbus*	Green-listed
Wren	*Troglodytes troglodytes*	Green-listed

Key ^ Red-listed species, * Amber-listed species (Gilbert *et al*. 2021).

Table 6.9: Avian species recorded historically in the 2km square, N54R, that encompasses the application site (NBDC).

Species	Scientific Name	BoCCI Status
Barn Swallow*	*Hirundo rustica*	Amber-listed
Magpie	*Pica pica*	Green-listed
Blackcap	*Sylvia atricapilla*	Green-listed
Black-headed Gull*	*Larus ridibundus*	Amber-listed
Blue Tit	*Cyanistes caeruleus*	Green-listed
Chaffinch	*Fringilla coelebs*	Green-listed
Coal Tit	*Periparus ater*	Green-listed

Species	Scientific Name	BoCCI Status
Blackbird	*Turdus merula*	Green-listed
Bullfinch	*Pyrrhula pyrrhula*	Green-listed
Cuckoo	*Cuculus canorus*	Green-listed
Linnet*	*Carduelis cannabina*	Amber-listed
Pheasant	*Phasianus colchicus*	Green-listed
Raven	*Corvus corax*	Green-listed
Snipe^	*Gallinago gallinago*	Red-listed
Starling	*Sturnus vulgaris*	Green-listed
Swift^	*Apus apus*	Red-listed
Curlew^	*Numenius arquata*	Red-listed
Jackdaw	*Corvus monedula*	Green-listed
Sparrowhawk	*Accipiter nisus*	Green-listed
Goldfinch	*Carduelis carduelis*	Green-listed
Greenfinch	*Carduelis chloris*	Green-listed
Robin	*Erithacus rubecula*	Green-listed
Fieldfare	*Turdus pilaris*	Green-listed
Goldcrest	*Regulus regulus*	Green-listed
Great Tit	*Parus major*	Green-listed
Dunnock*	*Prunella modularis*	Amber-listed
Hooded Crow	*Corvus cornix*	Green-listed
House Martin*	*Delichon urbicum*	Amber-listed
House Sparrow*	*Passer domesticus*	Amber-listed
Lesser Redpoll	*Carduelis cabaret*	Green-listed
Meadow Pipit^	*Anthus pratensis*	Red-listed
Mistle Thrush	*Turdus viscivorus*	Green-listed
Lapwing^	*Vanellus vanellus*	Red-listed
Treecreeper	*Certhia familiaris*	Green-listed
Woodpigeon	*Columba palumbus*	Green-listed
Redwing^	*Turdus iliacus*	Red-listed
Reed Bunting	*Emberiza schoeniclus*	Green-listed
Rook	*Corvus frugilegus*	Green-listed
Skylark*	*Alauda arvensis*	Amber-listed
Song Thrush	*Turdus philomelos*	Green-listed
Spotted Flycatcher*	*Muscicapa striata*	Amber-listed

Species	Scientific Name	BoCCI Status
Pied Wagtail	*Motacilla alba*	Green-listed
Willow Warbler	*Phylloscopus trochilus*	Green-listed
Wren	*Troglodytes troglodytes*	Green-listed
Yellowhammer^	*Emberiza citrinella*	Red-listed

Key ^ Red-listed species, * Amber-listed species (Gilbert *et al*. 2021).

Other than pest species, certain gamebirds and alien bird species, Irish birds are protected under the Wildlife Acts (1976 - 2012), where it is an offence to hunt, interfere with or destroy their breeding or resting places (unless under statutory licence/ permission).

6.4.6 Other taxa

Given the lack of vegetative cover within the application site it was unsurprising that there were no records of other rare or protected taxa from within the application site. Common Frog, *Rana temporaria*, was recorded at several locations elsewhere on the landholding and Frogs breed in pools near the sand quarry on site.

No near threatened or endangered invertebrate fauna have been recorded historically in the 2km Grid Square in which the application site is located (N54R NBDC). Similarly, there are no records of Common Lizard, *Zootoca vivipara* or Smooth Newt, *Lissotriton vulgaris* from this area. Neither species were noted on site as part of the 2009 EIS for the quarry extension, however, the Biodiversity Plan prepared for the site (Openfield Ecology 2009) noted that Common Lizard, *Zootoca vivipara* had been observed within the landholding in the past. Smooth Newt, *Lissotriton vulgaris* larva was also recorded within ponds in the wider quarry site.

The Biodiversity Plan for the site (Openfield Ecology 2009) recorded the presence of several species of butterflies including Speckled Wood, *Pararge aegeria*, Red Admiral, *Vanessa atalanta*, Painted Lady, *Vanessa cardui*, Small Tortoiseshell *Aglais urticae* and Small White, *Pieris rapae*. None of these species are protected.

6.5 Potential Ecological Impacts

Potential ecological impacts of the proposed development on the receiving environment are discussed below. A full description of the proposed development is provided in Chapter 3 of this EIAR.

6.5.1 Potential Impacts on Designated Conservation Sites

A screening in support of the Appropriate Assessment (AA) process has been prepared and accompanies the planning application for this development.

No Natura 2000 sites are located within 5km of the proposed application site. There is a hydrological pathway to the River Boyne and River Blackwater SAC and SPA via surface water discharge from Breedon Quarry to the Kinnegad River.

The potential for indirect impacts to the water quality of the relevant designated sites as a result of the proposed extension of quarrying works is considered to be very low. There is a considerable distance between the application site and these designated sites (*c.* 12.8 km downstream). As set out in Chapter 8 (Water) of this EIAR, the proposed extension works will not result in any significant increase in discharge volume to the Kinnegad. The quarry has extensive surface-water management systems in place and undergo regular emission inspections in order to ensure compliance with the license limits set down by the EPA in the IE Licence (P0487-07). The management of surface water will continue according to the existing protocols. The existing licensed surface water management system is designed to ensure that water quality in the Kinnegad River and watercourses downstream is protected. No additional, or residual risks to water quality of downstream watercourses have been identified in relation to the proposed development, on its own or in combination with any other plans of projects.

The screening for AA considers the potential for likely significant effects on Natura 2000 sites in the wider receiving environment. This includes consideration of the potential for ex-situ likely significant effects on mobile qualifying interests of designated Natura 2000 sites in the receiving environment. It is objectively concluded that there is no likelihood of significant effects on any of the Natura 2000 located in the wider area.

6.5.2 Potential Impacts on Habitats and Flora

The habitats and vegetation which occur within the survey area are generally considered to be of relatively low value and none of the plant species recorded within the survey area are listed on the 2022 Flora Protection Order and none are considered to be rare in a local context. The habitats which occur have a low botanical diversity and are considered to be common and widespread throughout Ireland (Fossitt 2000). None of the habitats which were recorded correspond to ecologically important habitats listed in Annex I of the EU Habitats Directive (European Commission, 2013). No Third Schedule Invasive Plant Species are present within the application site. The potential for indirect habitat loss or degradation associated with the development is considered in Section 6.4.1 above and in detail in the Screening for AA which accompanies the planning application for this development.

The following habitats within the application site will likely disturbed and potentially lost as a result of the proposed deepening works.

- Spoil and bare ground (ED2)
- Recolonising bare ground (ED3)
- Scrub/Dry meadow and grassy verge mosaic (WS1/GS2)

The Spoil and bare ground (ED2) habitat is frequently subject to anthropogenic disturbance (*i.e*. regularly used as access tracks) and contains no vegetation, making it of negligible importance to floral and faunal species. The Recolonising bare ground (ED3), while less disturbed, is still considered to be of low value given the paucity of species present. While Scrub (WS1) and Dry meadow and grassy verge (GS2) are typically of ecological value to a range of species such as small mammals, birds and insects, the size and condition of this habitat is such that it is considered to be of low quality.

Overall, these habitats have been evaluated as locally important and of lower value, they are also common in the wider environment.

The application site primarily consists of the existing limestone quarry, classified as the highly disturbed habitat Active mines and quarries (ED4), which is proposed to be deepened. This habitat is considered to be locally important and of lower value. As a result of the proposed extension, the extent of this habitat will increase overall, albeit for the operating lifespan of the quarry.

In the longer term the previously permitted Restoration Plan for Breedon Quarry, including the application site, after quarry operations have ceased will lead to a likely slight to moderate positive effect on the habitats present within and adjacent to the application site.

6.5.3 Potential Impacts on Non-Volant Mammals

No setts, holts or dens are present within the application site and the mammal fauna recorded to be present are common species in an Irish context and typical of an assemblage of species likely be found in such an environment. The proposed extraction area is of generally low ecological value and should any non-volant mammals occur here, it is likely on a transient basis only.

Otter spraint was recorded outside the application site, in proximity to SW1 on the Kinnegad River. No signs of otter activity were recorded within or adjacent to the application site. No breeding or resting places (holts, couches, *etc*.) were recorded within the study area, including the reach of the Kinnegad adjacent to the landholding north boundary. The proposed extraction area is of generally low ecological value and should otter occur here, it is likely on a transient basis only. In terms of disturbance impacts, the proposed development is located within the context of an active quarry with a considerable amount of noise and movement of plant and personnel. Local mammals, including Otter, are likely to be habituated to some degree of anthropogenic noise and visual disturbance. There will be no lighting of the quarry floor and no change in the nature or extent of artificial illumination within the wider quarry area. The noise and vibration impacts associated with the proposed development will remain comparable to the current level of operation at the quarry. There will be no increase in the number or type of plant or machinery associated with the quarry deepening. There will be no change to the blasting methodology (or frequency) associated with the proposed development. Consequently, the current overall level of noise/vibration disturbance from the quarry will not change to any significant extent.

In the longer term the previously permitted Restoration Plan for the quarry, including the application site, after quarry operations have ceased will lead to a likely slight to moderate positive effect on the non-volant mammals present within the application site.

6.5.4 Potential Impacts on Bats

Analysis of bat survey data shows a relatively poor diversity of species and a low level of overall bat activity in the area. There was no evidence of roosting bats anywhere within, or adjacent to the application site. The bat species recorded are relatively common and widespread species in Ireland. The most commonly recorded species was Common Pipistrelle. Common Pipistrelle is among Ireland's smallest bat species and one of the most common and can be seen in both rural and urban areas.

There are no features within the application site that are attractive for use by roosting bats. Old farm buildings within the wider landholding were shown to have a small number of roosting bats in the past (Kelleher 2009). A number of bat roost boxes have been erected within the quarry site and a bat management plan was also developed for the site (Keeley 2018). Bats may occasionally forage or commute over, or adjacent to the application site, particularly over the access tracks and scrub mosaic habitat. However, it is considered likely that the bats will utilise the hedgerow, more developed scrub, and ponds within the greater quarry area for foraging and commuting purposes. These habitats will not be impacted by the proposed extension.

There will be no lighting of the quarry floor and no change in the nature or extent of artificial illumination within the wider quarry area.

The noise and vibration impacts associated with the proposed development will remain comparable to the current situation at the quarry. There will be no increase in the number or type of plant or machinery associated with the quarry deepening. There will be no change to the blasting methodology (or frequency) associated with the proposed development. Consequently, the current overall level of noise/vibration disturbance from the quarry will not change to any significant extent.

It is unlikely that there will be any significant changes in how bats utilise the application site and wider quarry area as a result of noise and/or visual disturbance.

In the longer term the previously permitted Restoration Plan for the quarry, including the application site, after quarry operations have ceased will lead to a likely slight to moderate positive effect on the bats present within the application site. The lake and pond habitats are likely to be attractive for foraging bats and the woodland and vegetated areas will provide some additional foraging and commuting opportunities for bats.

6.5.5 Potential Impacts on Birds

The potential for impacts, primarily indirect impacts arising from water quality deterioration, upon the special conservation interests of the River Boyne and River Blackwater SPA as a result of the proposed extension are considered in Section 6.4.1 above and in detail in the Screening for AA which accompanies the planning application for this development.

The habitats within the application site are considered to be of low value for birds. Within the existing quarry, there is some attractive breeding and foraging habitat for birds, particularly associated with the patches of scrub and woodland, as well as the excavated sandbanks, rock-faces and settlement ponds. The areas within the application site are of very little value to birds, lacking vegetative cover, standing water or other features attractive to birds. Much of the local species' diversity recorded during the 2022 survey visits was associated with adjoining lands.

Ongoing works at the quarry have the potential to cause disturbance to the bird community through displacement especially during clearance activities, blasting and use of machinery involved in quarry operations. It is likely that any species that utilise habitats within or adjacent to the application site or in the wider environment are accustomed to a certain level of noise disturbance. Furthermore, as outlined in Section 6.5.4 above, there will be no change in blasting methodology or frequency and no increase in human/machinery activity within the application site or wider quarry area as a result of the proposed development. Studies on bird displacement due to disturbance have yielded somewhat inconsistent and inconclusive results (Percival 2003, Langston & Pullan 2003 & 2004, Kingsley & Whittam 2005, Drewitt & Langston 2006). These studies have indicated that the scale of disturbance varies greatly between and within species.

A pair of Peregrine Falcon, *Falco peregrinus* was observed on a rock face *c*. 150m from the application site during ecological surveys. Peregrine Falcons are listed on Annex I of the EU Birds Directive. This species frequently nest and roost at active quarries and among buildings in urban areas. They become habituated to loud noises, *i.e*., blasting and disturbance and are fairly tolerant of the movement of plant and personnel. When protecting their nest or chicks, adults are noticeably more vocal and demonstrative. Typically, adult birds will call and display when a nest site is approached by an observer within a couple of hundred metres. It is likely that Peregrine regularly breed in the area and there is a considerable amount of suitable habitat for the species within the overall quarry site. This species is known to nest successfully in active quarries (Ruddock & Whitfield, 2007). However, blasting activity associated with the deepening of the quarry floor within the application site could negatively impact on breeding Peregrine Falcon. Early in the breeding season, particularly during the early incubation phase, noise and vibration disturbance caused by blasting could, in the absence of mitigation, potentially result in a breeding pair abandoning a nest site.

In the longer term the previously permitted Restoration Plan for the quarry, including the application site, after quarry operations have ceased will lead to a likely moderate positive effect on the birds present within the application site. The open water is likely to be attractive to a range of waterbird species, including wintering birds. The existing settlement ponds already attract species such as Teal, Wigeon and Mute Swan. Post restoration, the lakes and ponds are likely to be of regional importance for waterbirds.

6.5.6 Potential Impacts on Other Taxa

The habitats within the application site are of little importance for other taxa, including rare and protected species of invertebrates, amphibians and reptiles.

As outlined previously in Section 6.4.2, treated water from the quarry, including the application site, will pass through a series of artificial settlement ponds before ultimately discharging to the Kinnegad River via the primary site discharge point (SW1). The Kinnegad

River is an aquatic habitat that likely supports a range of aquatic habitats and fauna associated with them. Aquatic habitats are sensitive to negative effects such as creased siltation, contaminated run-off, fuel spills or subtler effect on hydrogeology. In this case, it is considered that such effects are unlikely to occur as a result of the proposed extension works, given that there is no evidence that the current quarrying operations have resulted in any negative downstream impact and the current water treatment regime on site appears to be functioning well. In relation to the existing settlement ponds, amphibians have been recorded utilising these aquatic habitats. Deepening of the quarry floor within the application site will not result in any significant change in the volume of water or sediment-load entering these ponds.

In the longer term the previously permitted Restoration Plan for the quarry, including the application site, after quarry operations have ceased will, in the long-term, create new habitats for other taxa to use and take refuge in as the vegetation matures.

6.5.7 Do-nothing Impact

The do-nothing scenario is the continued extraction of the active quarry area until it is exhausted, prior to restoration and closure.

The overall impact would be expected to be highly localised and in the short to medium term there would be very little perceptible change in the local ecology. In the longer term there is some potential for the revegetated quarry to be an increasing area of local biodiversity, particularly with some scrub encroachment and areas of semi-natural habitat.

6.5.8 Cumulative Impacts

The application site where the deepening of the quarry floor is proposed occurs within an area which is heavily modified and disturbed by human activities. The quarry has been subject to a number of granted planning permissions since commencing works in 2002, which are outlined in Section 6.1.3, with the most recent of these granted in February 2019 (Ref: TA181329) and November 2021 (Ref: 211146). The proposed development will not result in an increase in in the rate of extraction or production within the quarry and there will be no change in blast methods or frequency. The quarry is subject to strict emission limits and in order to be compliant with the most recent EPA licence (P0487-07), the quarry is required to produce regular detailed environmental monitoring reports.

The other planning permissions and live applications in the surrounding area were reviewed using myplan.ie and are listed below in Table 6.10. This includes a planning application for a proposed solar farm within an overall area of *c*. 21.8ha. This proposed solar farm is within the overall Breedon landholdings and is located to the northeast of the application site. Permission for this proposed development has not yet been granted at the time of this report. A screening statement was prepared for this project and concluded that the proposed solar farm did not have the potential to result in significant effects on any Natura 2000 sites, namely the River Boyne and River Blackwater SAC, The River Boyne and River Blackwater SPA (Enviroguide Consulting, 2022).

Given the context of the existing site and considering the nature of the proposed works, it is concluded that it is unlikely that there will be any significant in-combination effects with either

the existing quarry operations or the other permitted/proposed developments listed in Table 6.10.

Table 6.10: Planning Applications in the Immediate Area surrounding the site.

Reference No.	Address	Project Description	Distance from Subject Site
22958	Killaskillen Townland, Kinnegad, Co. Meath	Development will consist of a 10-year permission for a Solar PV Energy Development on lands to the east and west of the L8021 (Local Road) within an overall area of c. 21.8 hectares (eastern parcel of c. 18.5 hectares and western parcel of c. 3.3 hectares).	*c*. 186 metres
TA190618 (MCC)	Killaskillen Kinnegad Co. Meath	A) Construction of an agricultural building to include cubicles, underground slurry flow channels and underground slatted slurry tanks. B) Construction of an agricultural building to include a milking parlour, dairy & ancillary rooms, livestock waiting yard and handling facilities, straw bedded area and an underground soiled water tank. C) Construction of 2no. Silage pits. D) Erection of a meal bin and water storage tank and all associated site works	*c*. 760 metres
TA200091 (MCC)	Cappabogan House, Kinnegad, Co. Meath	planning permission for a two storey extension to my existing dwelling to include on the ground floor a Kitchen, dining, utility and wet room and on first floor a bathroom, hot press, bedroom and master bedroom with wardrobe, en-suite and to demolish existing extension at rear and to demolish existing shed at side and construct a chimney and remove dash finish to reveal stone finish and decommission existing septic tank and install a treatment system with percolation area with all ancillary site works	*c*. 930 metres
WMCC)	Rattin , Kinnegad , Co. Westmeath	The development will consist of the construction of a dormer bungalow detached dwelling, detached garage, upgraded existing agriculture entrance off public road, proprietary tertiary treatment system and infiltration treatment area and all ancillary site works.	*c*. 1.4 km
TA191415 (MCC)	Gortnahorna Ballinabrackey, Co. Meath	the construction of a new detached storey and half type dwelling along with a detached single storey domestic garage, together with access from public road via recessed entrance, installation of a new proprietary wastewater treatment system together with all associated landscaping, site works and services	*c*. 1.7km

6.6 Avoidance, Mitigation & Enhancement Measures

The quarry currently has in place an extensive infrastructure and management system to contain and/or treat potential pollutants and to ensure that emissions are within the strict license limits set down by the EPA in the IE Licence (P0487-07). Environmental management systems are regularly audited and proven to be effective.

Opportunities for ecological enhancement measures as part of the Restoration Plan have been identified. Breedon have previously commissioned and implemented a Biodiversity Plan (Openfield Ecology 2009) and a Bat Management Plan (Keeley 2018).

All mitigation identified in other Chapters of the EIAR will be fully implemented, including those elements designed to control run-off and to prevent any pollution of soil, surface or groundwater.

An ecological biodiversity audit of the quarry site will be completed by a suitably qualified ecologist in the late operational phase, or prior to the commencement of major restoration works. Findings of this study will be used to update any biodiversity management commitments and to produce site-specific biodiversity enhancement measures for the benefit of non-volant mammals, bats and birds, including waterbirds and raptors.

To address any concerns regarding the environmental impacts arising from the quarry, this EIAR provides updated Mitigation and Monitoring measures (see Chapter 16 of the EIAR). It is proposed, in the event of a grant of permission for the development proposed, that Breedon Group will develop and implement an Operational Mitigation and Biodiversity Management Plan, reviewing this every 5 years up to the end of the quarry's 25 year life and submitting same with the Local Authority for agreement on a 5-yearly basis.

6.6.1 Designated Conservation Sites

A Screening for AA was prepared to consider if there were any likely significant effects on any Natura 2000 site(s), namely the River Boyne and Blackwater SAC and SPA, arising from the proposed extension of quarrying activity within the application site. It is objectively concluded that there is no likelihood of significant effects on any of the Natura 2000 located in the wider area.

6.6.2 Peregrine Falcon

A toolbox talk with supporting information on Peregrine Falcon will be provided for all relevant site-staff at the quarry, during induction. All relevant existing staff will be made aware of the presence of the species and the environmental manager will maintain a sightings log and reporting protocol in the event that the birds are observed within the active quarry. Prior to the commencement of blasting on site during the spring/summer months, a survey will be carried out to establish the presence/absence of breeding Peregrine Falcon. If breeding Peregrine Falcon are present in the vicinity of the proposed blast location, the ecologist or environmental manager will prepare a Peregrine Falcon Management Plan and advise on an appropriate protocol for management of potential disturbance and displacement of breeding Peregrine. This will include deferring and postponing blasts if there is a risk that cannot be

otherwise managed (e.g. by timing blasts when adult birds are not in attendance at a nest site).

6.6.3 Fauna

Any pooled water within the application site will be regularly checked for the presence of amphibians. If Frogs, Newts or spawn/larvae are present these will be translocated under licence to suitable receptor sites within the landholding.

A mammal survey will be carried out upon closure by a suitably qualified ecologist to identify any protected mammals that may be present and to provide advice on the appropriate actions prior to the commencement of the Restoration Plan.

6.6.4 General Environmental Measures

During the operational phase, monitoring of water levels and flow rates in the Kinnegad River shall be carried out on a daily basis and on the Western and Eastern Tributaries on a monthly basis. The general environmental measures that will be implemented will be in line with the conditions of operation in the EPA licence for the existing quarry site.

Monitoring records shall be available at the site, for inspection at all reasonable times by Agency personnel and a summary report on this monitoring shall be submitted annually as part of the AER;

- Breedon will ensure, during the period from 1 November to 30 April, that the discharge to waters from the site shall not cause the unaffected temperatures in the Kinnegad River at the edge of the mixing zone to be raised by more than 1.5^{o}C;
- Surface water quality of discharges to the Kinnegad River from the settlement lagoon will be monitored on a continuous basis along with monthly, weekly and daily readings as required;
- The flow rate of discharges from SW1 and SW2 will be monitored continuously;
- Flow and water level in the Western and Eastern tributaries of the Kinnegad River will be monitored monthly;
- A visual examination of the surface water discharges shall be carried out daily. A log of such inspections shall be maintained.
- This monitoring programme is currently implemented at Breedon Quarry and further existing commitments (below) will also apply to the current application site.
- Where heavy fuel oils are used, only heavy fuel oil with a sulphur content of less than 1% (by mass) shall be used in the kiln;
- Raw materials, semi-finished and finished products will be stored in appropriate storage facilities throughout the site;

- Raw materials obtained from the quarry will be transported within the site on an enclosed conveyor system;

- Permitted alternative raw materials will be transported to the site in covered trucks and will be stored in dedicated covered storage areas;

- All edible and putrescible wastes will be stored and disposed of in an appropriate manner;

- Industry standard Environmental control measures relating to soil management and water management, will be implemented to minimise the risk of impact surface water and groundwater in the area. For example, the use of bunded storage of fuels and regular inspection and maintenance of vehicles on-site will minimise the risk of any spillages of fuel and other hydrocarbons. All vehicles on-site will be equipped with spill-kits and all site personnel will be trained in their correct use;

- No specified emission to the atmosphere shall exceed the emission limit value set out in *Schedule 1(i) Emissions to Atmosphere* of this licence, subject to Condition 3 of the IPC licence. There shall be no other emission to the atmosphere of environmental significance;

- During weather conditions which favour the dispersion of dust, the licensee shall ensure that a procedure for the control of windblown dust and dust from the movement of machinery shall be operated and maintained by the license;

- Existing noise mitigation measures in place at the site which includes screening banks, screen & enclosures and optimum location of plant shows that the facility and all site activities and work practices have been designed and are managed to minimise the noise impact at receptors beyond site boundaries;

- If noise monitoring indicates an increase in emission levels from the facility the incident will be reported and investigated;

- Breedon will ensure that all operations on-site shall be carried out in a manner such that air emissions, including dust emissions, and/or odours do not result in significant impairment of, or significant interference with amenities or the environment beyond the site boundary;

- Regular and effective maintenance by trained personnel of all items of plant and machinery will ensure that no unnecessary noise is generated by their operation;

- The hours of operation of the overall plant will continue to be 24-hours a day Monday to Sunday. Deliveries of raw material to the site will not normally occur on Public Holidays;

- Disposal or recovery of waste shall take place only as specified with the appropriate National and European legislation and protocols. No other waste shall be disposed of/recovered either on-site or off-site without prior notice to, and prior written agreement of the Agency;

- Waste sent off-site for recovery or disposal shall only be conveyed by an authorised waste contractor. The waste shall only be transported from the site of the activity to the site of recovery/disposal in a manner which will not adversely affect the environment and in accordance with the appropriate National and European legislation and protocols.

6.7 Residual Impacts

None of the habitats identified within or directly adjacent to the application site were assessed as being of high value and the biodiversity-related impact of the permanent loss of Spoil and bare ground, recolonising bare ground and the scrub/grassland mosaic occupying the safety banks is considered to be *neutral imperceptible*. The active quarry habitat will increase in extent as a result of the deepening of the quarry floor. The impact to this habitat is considered to be neutral in the medium-term.

The mitigation by design and standard environmental controls (e.g. Chapter 17 of the EIAR) will minimise any direct or indirect negative effects (to neutral imperceptible) on the wider aquatic ecology.

The accompanying Screening for AA concludes that there is no likelihood of significant effects upon the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA, or indeed any other Natura 2000 sites in the wider hinterland.

There will be no significant loss of breeding or resting places for protected non-volant mammal species. Any non-volant mammals utilising the application site are likely accustomed to the existing level of quarry-related disturbance and this will not change as a result of the proposed deepening works. There will likely be a moderate increase in disturbance during the permitted restoration works which will likely result in potential *negative imperceptible* impacts in the *short-term.*

There will be no loss of roosting habitat for bats associated with the deepening of the application site. There will be a minor and highly-localised potential loss of marginal foraging/commuting habitats within the application site, however, these features are considered to be sub-optimal for bat species in general and there is more attractive foraging and commuting habitat available for bats in the wider environment. Potential impacts on bats at the site are regarded as *neutral* to *slight negative* in the *short-term*.

The awareness training and protocols that will be applied to protect nesting/roosting Peregrine Falcons effectively addresses the potential for disturbance and displacement impacts on birds that are occurring within the quarry site. Due to the generally low value of the application area for birds in general, potential impacts on birds arising from the proposed extension works are considered as *neutral slight* to *imperceptible in the medium/long term*.

With the implementation of the environmental controls and the mitigation measures outlined above, it is concluded that the residual impacts on habitats and botanical species, birds, mammals (including bats) and other fauna will be *slight neutral* in the *medium* to *longer term.*

In the longer term, the previously permitted Restoration Plan, which encompasses the application site, will likely see a moderate to significant positive effect on local biodiversity.

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