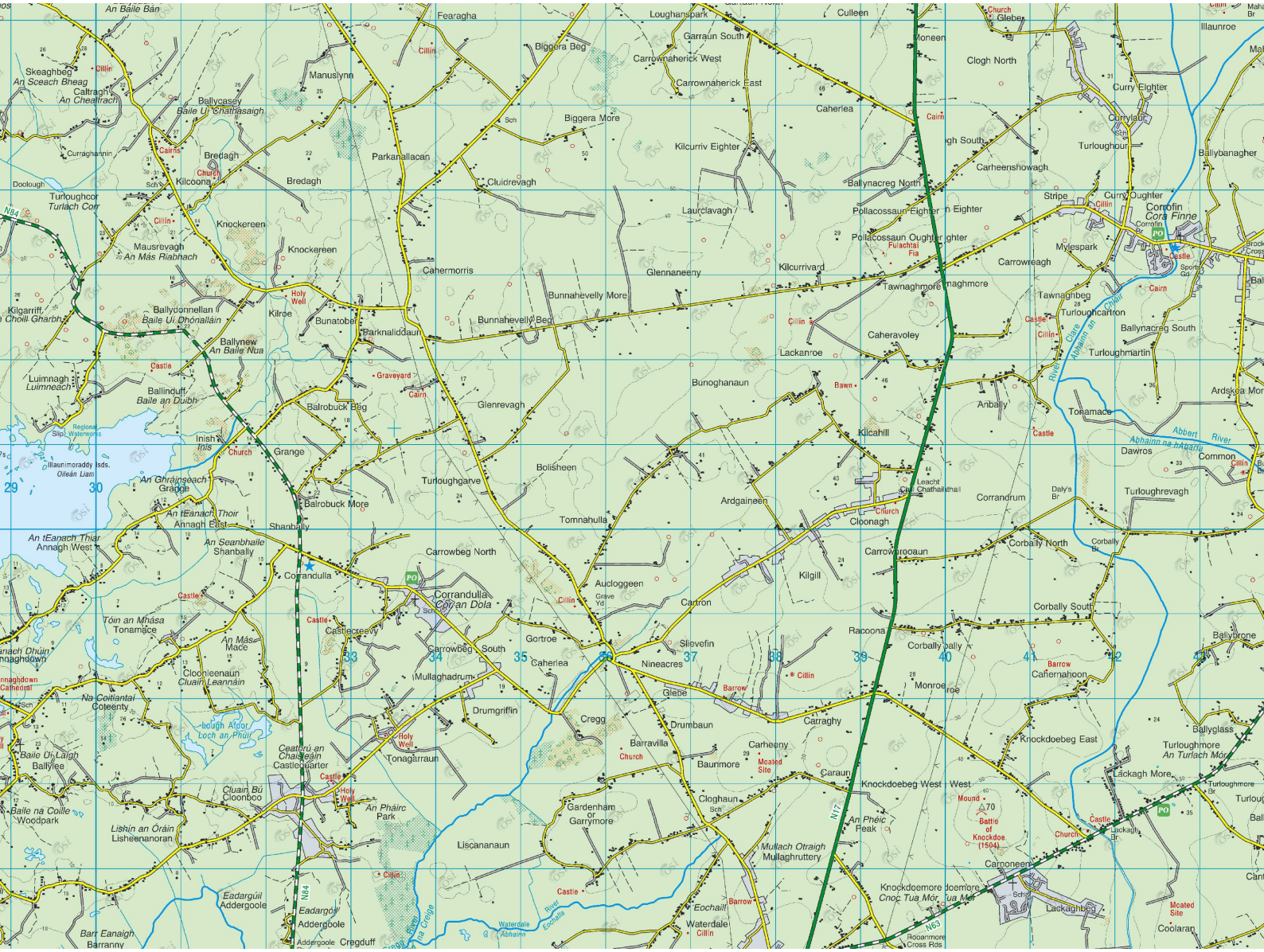
CHAPTER 6

BIODIVERSITY



QUARRY CONSULTING

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CHAPTER 6: BIODIVERSITY

Introduction

Background

6.1 This chapter provides an Ecological Impact Assessment (EcIA) undertaken by Green and Blue Ecology acting on behalf of Quarry Consulting to inform the wider Environmental Impact Assessment (EIA) process and preparation of the Environmental Impact Assessment Report (EIAR) on the likely significant impacts on biodiversity from the proposed extension to the limestone quarry at Ardgaineen, Claregalway, Co. Galway.

Purpose of the Ecological Impact Assessment

6.2 The EcIA can be considered as having three main purposes:

- to provide an objective and transparent assessment of the ecological effects of the proposed development and the implications on biodiversity;
- to permit objective and transparent determination of the consequences of the proposed development in terms of national, regional and local policies relevant to nature conservation and biodiversity; and
- to demonstrate that the proposed development will meet the legal requirements relating to habitats and species.

6.3 This EcIA has been undertaken in accordance with the guidelines published by the Chartered Institute of Ecology and Environmental Management (CIEEM)[1] '*the CIEEM EcIA Guidelines*' and with respect to the Environmental Protection Agency's (EPA) guidelines for carrying out Environmental Impact Assessment Reports[2].

6.4 The assessment follows a standard approach based upon: the description of the existing baseline conditions within the application site; the determination of important ecological features; and the identification of all potentially significant ecological effects from the proposed extension of an existing limestone quarry at Ardgaineen. The assessment also considers the likelihood of any cumulative effects, i.e. those resulting from the proposed development and other plans or projects on relevant ecological features.

6.5 Where a negative impact has been identified, suitable mitigation measures to prevent, reduce or offset the level of impact are provided, or where mitigation is not possible, enhancement and compensation measures are detailed to ensure compliance with nature conservation legislation and to address any potentially significant effects on biodiversity.

6.6 Where appropriate this Chapter also identifies how mitigation, enhancement and compensation measures will / could be delivered along with the requirements for post-construction monitoring, maintenance or management.

6.7 Any residual effects arising, following implementation of mitigation and enhancement measures, are then identified and assessed, with any significant effects clearly described.

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[1] CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial , Freshwater and Coastal and Marine*. Version 1.2. Chartered Institute of Ecology and Environmental Management, Winchester.
[2] Environmental Protection Agency (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*. Environmental Protection Agency. Johnstown Castle Estate, Co. Wexford.

Legislative and Policy Context

Legislation

6.8 Relevant legislation underpinning the conservation of designated sites, habitats and species is summarised in Table 6.1.

Table 6-1: Relevant Legislation

Legislation	Description
The Wildlife Act 1976 (as amended)	The Wildlife Act is the primary legislation in Ireland which protects animals, birds, plants and their habitats. It also allows the designation of Natural Heritage Areas (NHA) and statutory Nature Reserves and the regulation of hunting and controls in wildlife trading.
The Flora (Protection) Order 2022	The Flora (Protection) Order 2022 provides statutory protection to a number of rare plant species in Ireland from being wilfully cut, picked uprooted or damaged or part of the plants removed.
European Communities (Birds and Natural Habitats) Regulations 2011 (as amended)	The European Communities (Birds and Natural Habitats) Regulations 2011 transpose into national law European Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive) and Directive 2009/147/EC on the Conservation of Wild Birds (The Birds Directive) that provides for the designation and protection of *'European sites'* including Special Areas of Conservation (SAC) and Special Protection Area (SPA), the protection of *'European Protected Species'*, and the adaptation of planning and other controls for the protection of European Sites. The regulations introduce a review procedure for plans and projects likely to significantly affect a European site, and licensing requirements for developments that may affect a European protected species

Planning Policy

National

6.9 The National Development Plan 2021-2030 sets out the infrastructure and investment priorities that underpin the implementation of the National Planning Framework. The National Development Plan details the main investment projects, programmes and priorities in Ireland during the lifetime of the Plan.

6.10 The National Planning Framework contains a set of national objectives and key principles as a framework to guide development and investment by empowering each region to lead in the sustainable planning and development of their communities.

Regional

6.11 The Regional Spatial and Economic Strategy 2020-2032 sets out the long-term spatial planning strategy for the Northern and Western Region, covering the counties of Cavan, Donegal, Galway, Leitrim, Mayo, Monaghan, Roscommon and Sligo.

Local

6.12 Planning policy at the local level is provided by the Galway County Development Plan 2022-2028 adopted on 28th September 2022. The Galway County Development Plan contains a number of policies relevant to biodiversity that are summarised at Appendix 6A.

Biodiversity Planning

6.13 Ireland's National Biodiversity Plan 2023-2030[3] identifies actions towards understanding and protecting biodiversity in Ireland with the vision "*that biodiversity and ecosystems in Ireland are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally*".

6.14 Local Biodiversity Action Plans have been produced by some County Councils, among them the Galway County Heritage and Biodiversity Plan 2017-2022, which identify programmes of action to protect and enhance biodiversity at a local level.

Assessment Methodology and Significance Criteria

Area of Study

6.15 The area of study was defined on a spatial scale at which ecological features could be affected by the proposed extension of an existing limestone quarry at Ardgaineen. This included all the land lying within the application site as well as ecologically sensitive features within the wider surrounding area with the potential to be directly or indirectly affected by the proposed development.

6.16 Based on size and nature of the proposed development and the local landscape it is considered that the maximum extent of any potential zone of influence over which ecological features may be affected by biophysical changes as a result of the proposed development and associated activities would not extend beyond 2km from the boundary of the application site.

Establishing Baseline Ecological Conditions

6.17 Baseline ecological data was collated through a combination of desk-based studies and field survey consistent with current standard methodologies and published guidelines. The scope of the ecological field surveys was defined on the basis of known and potential ecological interest within the area of study, and best practice[4].

6.18 Table 6.2 provides a summary of the ecological scope of works and the methods used to establish the ecological baseline conditions within the study area.

6.19 Over and above the scope of works in Table 6.2, it was deemed that no other specialist surveys were necessary in respect to the habitats present at the application site and their potential to support protected species.

[3] National Parks and Wildlife Service (2023). Ireland's 4th *National Biodiversity Plan 2023-2030*. Government of Ireland.
[4] Institute of Environmental Assessment (1995). *Guidelines for Baseline Ecological Assessment*. Chapman and Hall (E & F N Spon), London.

Table 6.2: Ecological Scope of Works and Methodologies

Study / Survey	Scope of Works	Study Area	Methodology
Desk-based study	Statutory and non-statutory designated sites	All sites within a 2km radius of the application site	Web-search including the National Parks and Wildlife Service (NPWS) interactive mapping facility (https://www.npws.ie).
	Protected, rare and notable species	2km grid squares encompassing the application site (grid square M33U, M33Z, M34Q and M34V).	Web-search including information held by the NPWS and the National Biodiversity Data Centre (NBDC) (https://www.biodiversityireland.ie) on 9th June 2024.
Habitat Survey	To record and classify the habitat types and appraise on the likely presence / absence of protected species	Application site	Initial site visit and walkover survey by Steve Judge MCIEEM of Green & Blue Ecology on 18th April 2024. Standard approach to the classification and mapping of habitats in accordance with Fossitt (2000)[5] to Level 3 and target notes where applicable to describe any feature of particular ecological interest. Extension of Habitat Survey method to include an assessment of habitats for evidence of, or their potential to support protected, rare or notable species (including mammals, birds, reptiles, amphibians and invertebrates) and any other important ecological feature that may require mitigation or an ecologically sensitive design in respect of the proposed development.
Hedgerow Appraisal	To assess the conservation value of hedgerows / treelines	Application site	A detailed assessment of the hedgerows within and along the boundaries of the application site was undertaken by Green & Blue Ecology during the Habitat Survey.

[5] Fossitt, J.A. (2000). *A Guide to Habitats in Ireland*. Reprint 2007. The Heritage Council, Kilkenny, Ireland.

			Each hedgerow was assessed against the criteria for determining the '*significance*' of hedgerows under the Hedgerow Appraisal System (HAS)[6] based on ranking the hedgerows on a scale of 0 (low significance) to 4 (highly significant) in five categories of significance including: historical; species diversity; structure, construction and associated features; habitat connectivity and landscape.
Bat Survey	To provide baseline information on the species of bat present and how these species may be using any particular area for roosting, foraging and/or commuting	Application site	Manual bat activity surveys were undertaken by Steve Judge MCIEEM of Green & Blue Ecology on 21st/22nd July 2024 and 5th May 2025 in accordance with good practice guidelines[7]. The May 2025 survey included transect coverage through the operational quarry. Full details of the survey methodology is presented in the Bat Survey and Evaluation Report at Appendix 6D.

Uncertainty of Data and Limitations

6.20 The lack of evidence of any one particular protected species does not necessarily preclude its presence at the site either at this current time or in the future. It is considered however, that the timing of the site visit was suitable for protected species and their habitat-based assessment, as most species would have been active during this time and provided evidence of their presence.

6.21 The use of features and areas by bats varies seasonally and night-to-night, so absence during surveys does not preclude occasional use. The July 2024 transect excluded the active quarry void for health and safety reasons; coverage of the quarry was added in May 2025 and did not alter the overall conclusions given the negligible suitability of quarry faces and infrastructure for roosting and the low value of internal habitats for commuting/foraging. Identification of Myotis calls is inherently uncertain; conservative assignments to genus were used where species-level certainty was not possible.

Assessment Methodology

Determining Ecological Importance

[6] Foulkes, N., Fuller, J., Little, D., McCourt, S. and Murphy, P. (2013). *Hedgerow Appraisal System - Best Practice Guidance on Hedgerow Survey, Data Collation and Appraisal*. Woodlands of Ireland, Dublin.
[7] Collins, J. (ed.) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). Bat Conservation Trust, London.

6.22 In accordance with the CIEEM guidelines only ecological features (habitats, species, ecosystems and their functions/processes), which are considered to be important and potentially affected by the project should be subject to detailed assessment. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable.

6.23 CIEEM suggest that to ensure a consistency of approach, ecological features (designated sites, habitats and species) are valued in accordance with their geographical frame of reference. For the purpose of this assessment the geographical frame of reference defined by Transport Infrastructure Ireland[8] has been used, as detailed below:

- International;
- National;
- County;
- Local (higher); and
- Local (lower).

6.24 Some features can already be recognised as having ecological value, for example they may be designated as statutory or non-statutory nature conservation sites. Other ecological features may require an evaluation based upon their previously un-assessed biodiversity value and professional judgement. A summary of the criteria used in the evaluation of designated sites, habitats and species is provided in Table 6.3.

[8] NRA (2009). *Guidelines for Assessment of Ecological Impacts of National Road Schemes*. Revision 2. National Roads Authority, Dublin.

Table 6.3: Criteria for the Evaluation of Ecological Features

Value	Criteria
International	An internationally designated site or proposed site including SAC, Site of Community Importance (SCI), SPA, or Ramsar site, or an area which has been determined meets the published selection criteria for such designations, irrespective of whether or not it has yet been notified. World Heritage Sites, where the ecological feature assessed is an intrinsic part of the natural heritage value that led to the designation. An intrinsic part of the core area of a designated Biosphere Reserve. Undesignated sites containing 'best examples' of Annex I habitats under the EU Habitats Directive. Major designated salmonid waters. A resident or regularly occurring population of an internationally important bird species listed in Annex I and/or referred to in Article 4(2) of the EU Birds Directive and/or a species of animal or plant listed in Annex II and/or IV of the EU Habitats Directive and which is threatened or rare in and which is threatened or rare in Ireland or of uncertain conservation status or of global conservation in the National Biodiversity Plan. A resident or regularly occurring nationally significant population or of any internationally important species representing greater than 1% of its international population.
National	A nationally designated site or proposed as a National Heritage Area (NHA) or statutory Nature Reserve or Refuge for Flora and Fauna, or an area fulfilling the criteria for designations, irrespective of whether or not it has yet been notified. Undesignated sites containing good examples and viable areas of Annex I habitats under the EU Habitats Directive. A resident or regularly occurring population (>1% of the national population) of a nationally important species which is protected under the Wildlife Acts as amended or listed on a relevant Red Data list.

Value	Criteria
County	Areas identified as Areas of Special Amenity, subject to a Tree Preservation Order or Area of High Amenity where designated on the basis of their ecological value. Site containing area or areas of habitat types listed in Annex I of the EU Habitats Directive that do not fulfil the criteria for valuation of International or National importance. A resident or regularly occurring locally significant population (>1% of the county population) assessed of importance of a county important species and/or a species protected under the Wildlife Acts or listed in Annex I of the EU Birds Directive, Annex II and/or IV of the EU Habitats Directive or on a relevant Red Data list assessed to be important at County level. County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified within the NBP and/or Local Biodiversity Action Plan. Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local (higher)	Locally important populations of priority species or habitats or natural heritage features identified in any Local Biodiversity Action Plan. A resident or regularly occurring locally significant population (>1% of the local population) and/or a species protected under the Wildlife Acts or listed in Annex I of the EU Birds Directive, Annex II and/or IV of the EU Habitats Directive or on a relevant Red Data list assessed to be important at the Local level. Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality. Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local (lower)	Sites containing small areas of semi-natural habitat or features that are of some local importance for wildlife.

Assessment of Potential Impacts

6.25 The assessment of potential ecological impacts has been carried out in accordance with the guidelines published by CIEEM and EPA and be summarised as:

- the identification of the range of potential impacts that may arise from the proposed development;
- the consideration of the systems and processes in place to avoid, reduce and mitigate the possible effects of these impacts;

- the identification of opportunities for ecological enhancement within the development;
- an assessment of the residual impacts, following consideration for the implementation of avoidance, mitigation and enhancement measures; and
- where necessary the identification of compensation required to offset any residual effects.

6.26 Table 6.4 provides a summary of the criteria used to evaluate the residual impacts and assess the significance of any such impact.

Table 6.4: Key Considerations when Characterising Impacts

Value	Criteria
Direction of impact	Positive (a change that improves the quality of the environment) or Negative (a change which reduces the quality of the environment)
Probability of occurring	Broadly defined on 4 levels: Certain (95% chance or higher), Probable (above 50% but below 95%), Unlikely (above 5% but less than 50%) and extremely unlikely (less than 5%)
Magnitude	Size, amount, intensity and volume of any impact on any particular feature including any severity of effect, based on EPA's guidance, as imperceptible, slight, moderate, significant and profound.
Duration	Effects may be described, based on EPA's measures, as short (1 to 7 year), medium (7 to 15 years) or long-term (15 to 60 years) and permanent or temporary in ecological terms (e.g. within the lifetime of the species affected).
Frequency of timing	The number of times an activity will occur and timing of an activity
Reversibility	Whether or not the effect can be reversed from spontaneous recovery or which may be counteracted by mitigation within a reasonable timescale

6.27 Impacts are defined as being negative or positive. The term '*significant*' is independent of the value of the receptor. A significant impact is defined as an impact on the integrity of a defined ecosystem, and/or an action that undermines the conservation objectives (either specific or broad) of an important ecological feature.

6.28 Where a potential negative impact has been identified, mitigation, enhancement and/or compensatory measures have been formulated using best practice techniques and guidance to prevent, reduce or offset a significant effect. The degree of confidence in the likely success of mitigation or compensation, based upon published studies and the experience of the assessor, is also made and any uncertainties are clearly expressed.

6.29 The final part of the assessment is to determine the significance of the residual ecological impacts of the proposed development and also describe the implications of these operations from a legal perspective.

Avoidance, Mitigation, Compensation and Enhancement

6.30 A sequential process has been adopted to avoid, mitigate and compensate for ecological impacts. This is often referred to as the '*mitigation hierarchy*'.

6.31 It is important for the EIAR to clearly differentiate between avoidance, mitigation, compensation and enhancement and these terms are defined here as follows:

- Avoidance is used where an impact has been avoided e.g. through changes in scheme design;
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact in situ;
- Compensation describes measures taken to offset residual effects, i.e. where mitigation in situ is not possible; and
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

Assessment of Cumulative Impacts

6.32 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a particular location. This EcIA assesses the potential cumulative impacts from the proposed development with other projects which could include:

- proposals for which consent has been applied but which are awaiting determination;
- projects which have been granted consent but which have not yet been started or which have been started but are not yet completed (i.e. under construction);
- proposals which have been refused permission but which are subject to appeal and the appeal is undetermined;
- constructed developments whose full environmental effects are not yet felt and therefore cannot be accounted for in the baseline; or
- developments specifically referenced in a National Policy Statement, a National Plan or a Local Plan.

Baseline Conditions

6.33 This section provides an overview of the existing ecological baseline conditions at the application site of the proposed limestone quarry extension at Ardgaineen and within the wider surrounding environment.

General Site Description

6.34 The site of the existing limestone quarry is located in the townland of Ardgaineen approximately 8km north of Claregalway, Co Galway.

6.35 The existing operational limestone quarry covers an area of approximately 10.55 hectares (ha) with the application site covering approximately 12ha. The application site encompasses parts of the existing operational quarry used for the extraction of limestone and ten agricultural fields, or parts of fields, under permanent pasture.

6.36 The surrounding landscape is characterised by agricultural land comprised of relatively small fields under permanent pasture with some hedgerow boundaries interspersed by small blocks of woodland. The N83 national road runs in a north to south direction approximately 1.3km to the east of the quarry site with a large number of local roads criss-crossing the local area. The largest local urban population is the village of Kilgill to the south of the existing quarry with other smaller rural settlements and dispersed properties scattered along the roads and lanes that cross this area.

Designated Sites

6.37 The application site is not subject to any statutory or non-statutory nature conservation designations (SAC, SPA, NHA, Nature Reserve or pNHA) and there are no such sites within a 2km radius of the application site.

Habitats

6.38 The habitat types recorded within the application site based on the classification as defined by Fossitt (2000) are presented in Table 6.5.

Table 6.5: Habitat Types Recorded in the Application Site

Level 1 Habitat Hierarchy	Level 2 Habitat Hierarchy	Level 3 Habitat Hierarchy	Area / Length
G-- Grassland and marsh	GA – Improved grassland	GA1 - Improved agricultural grassland	6.77 ha
	GS – Semi-natural grassland	GS2 – Dry meadows and grassy verges	0.01 ha
W – Woodland and scrub	WS – Scrub / transitional woodland	WS1 – Scrub	0.02 ha
		WS2 – Immature Woodland	0.06 ha
	WL – Linear woodland / scrub	WL1 - Hedgerows	1,133 m
E – Exposed rock and disturbed ground	ED – Disturbed ground	ED4 – Active quarries and mines	5.09 ha
B – Cultivated and built land	BL – Built land	BL1 – Stone walls and other stonework	1,229 m

6.39 Figure 6.1 shows the location and extent of the habitats recorded at the application site and important habitats and other features identified immediately adjacent the application site. A summary description and ecological evaluation of each habitat and other key features is provided in Table 6.6.

Table 6.6: Description and Evaluation of Habitats and Other Features

Habitat Feature	Description	Location	Level of Value	Rationale
Grassland and Marsh				
GA1 - Improved agricultural grassland	*GA1 – Improved agricultural grassland* is present in the fields to the north and east of the existing quarry with low tightly grazed swards comprising of sweet vernal-grass (*Anthoxanthum odoratum*), crested dog's-tail (*Cynosurus cristatus*), cock's-foot (*Dactylis glomerata*), red fescue (*Festuca rubra*), Yorkshire-fog (*Holcus lanatus*) and perennial rye-grass (*Lolium perenne*). The herbaceous component is species-poor and includes: daisy (*Bellis perennis*); creeping thistle (*Cirsium arvense*); ribwort plantain (*Plantago lanceolata*); common sorrel (*Rumex acetosa*); dandelion *(Taraxacum officinale agg.*); red clover (*Trifolium pratense*) white clover (*Trifolium repens*); and common nettle (*Urtica dioica*). Bryophytes comprise of pointed spear-moss (*Calliergonella cuspidata*).	Application site and wider surrounding area	Local (lower)	A common and widespread habitat with little botanical interest and of low ecological and nature conservation value.
GS2 – Dry meadows and grassy verges	GS2 – Dry meadows and grassy verges is present on a berm extending along the south-eastern boundary of the application site with a rank sward comprising of false oat-grass (*Arrhenatherum elatius*), cock's-foot and Yorkshire-fog with black knapweed (*Centaurea nigra*), creeping thistle, meadow buttercup (*Ranunculus acris*), bramble (*Rubus fruticosus agg.*), broad-leaved dock (*Rumex obtusifolius*), common ragwort (*Senecio jacobaea*),	Application site	Local (lower)	A common and widespread habitat with little botanical interest and of low ecological and nature conservation value.

Habitat Feature	Description	Location	Level of Value	Rationale
	common nettle and bracken (*Pteridium aquilinum*) also present.			
Woodland and Scrub				
WS1 – Scrub	*WS1 – Scrub* habitat is typically dominated by common hawthorn (*Crataegus monogyna*) and where present forms extension to the *WL1 – Hedgerows habitat* where it has encroached into the adjacent fields.	Application site and immediate surrounding area	Local (lower)	A typically common and widespread habitat of low ecological and conservation value but which provides some but limited opportunities wildlife.
WS2 – Immature woodland	*WS2 – Immature woodland* comprising of linear band of Leyland cypress (*Cupressus x leylandii*) has been planted along the top of berm running along the south-eastern boundary of the site.	Application site	Local (lower)	Woodland strip comprising of one non-native species currently providing limited opportunities wildlife.
WL1 - Hedgerows	*WL1 – Hedgerows* typically form the field boundaries and sometimes associated with remnant stone walls. The hedgerows are typically co-dominated by common hawthorn and blackthorn (*Prunus spinosa*). Other woody species present can include: holly *(Ilex aquifolium*), bramble and elder (*Sambucus nigra*). Ground and field layers typically form an extension to the adjacent *GA1 – Improved agricultural grassland* habitat but in places can include lords-and-ladies (*Arum maculatum*), cleavers (*Galium aparine*), herb-Robert (*Geranium robertianum*) and lesser stitchwort (*Stellaria holostea*).	Application site and immediate surrounding area	Local (lower)	A typically common and widespread habitat, assessed as being of low conservation significance due to being species-poor and fairly gappy, but which provide some opportunities for wildlife.

Habitat Feature	Description	Location	Level of Value	Rationale
	A summary of the hedgerow appraisal is presented at Appendix 6B.			
Exposed Rock and Disturbed Ground				
ED4 – Active quarries and mines	ED4 – Active quarries and mines habitat is present in and forms part of the wider existing quarry site. It includes the current limestone extraction area, aggregate storage areas; parts of the processing areas, office buildings and an overburden storage bund.	Application site and other parts of the existing quarry site	Local (lower)	An anthropogenic habitat created through quarrying with little botanical interest and offering limited opportunities for wildlife.
Cultivated and Built Land				
BL1 – Stone walls and other stonework	Remnant *BL1 – Stone walls and other stonework* habitat is present along some of the field boundaries and is typically associated with the *WL1 – Hedgerows* habitat. The walls are typically in a poor state of repair with many sections collapsed or missing.	Application site	Local (lower)	A common and widespread habitat in Co. Galway but not the best examples with little botanical interest but due to their association with hedgerows provide some opportunities for wildlife.

Species

6.40 Details of protected, rare and notable species records within a 2km radius of the application site (encompassing grid squares M33U, M33Z, M34Q and M34V) were obtained during the desk-based study and during the Habitat Survey, where general observations and searches were made for the presence, or potential presence of protected, rare and/or notable species for flora and fauna.

6.41 Table 6.7 provides a summary of species of importance and an evaluation of the site for these species.

Table 6.7: Identification and Evaluation of Species

Species	Desk-based Study	Description of Use or Likely Use of the Application Site	Level of Value	Rational
Flora				
Protected, rare and notable species	No records of protected, rare or notable species of flora were returned by NBDC for the search area.	During the Habitat Survey no protected, rare or notable species of flora were recorded at, or immediately adjacent the application site.	Not applicable	All reasonable likelihood of absence.
Non-native invasive species	No non-native invasive species, as listed under either the Wildlife Act 1976 (as amended) or the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) were returned by NBDC for the search area.	During the Habitat Survey no non-native invasive species were recorded as present in the application site.	Not applicable	All reasonable likelihood of absence.
Mammals				
Badger	NBDC returned one record for badger (*Meles meles*) within the search area in excess of 1km west of the application site.	During the Habitat Survey no evidence of badger setts or other signs of badger were found to indicate the presence of badger (i.e. tracks, latrines, snuffle holes or hairs) within the application site, or its immediate surrounding area.	Not applicable	Not present.

Species	Desk-based Study	Description of Use or Likely Use of the Application Site	Level of Value	Rational
Bat assemblage	NBDC returned a solitary record for pipistrelle (*Pipistrellis pipistrellis sensu lato*) within the search area. A bat survey encompassing the application site was carried out by Earth Science Partnership Ireland Ltd in 2018. This survey recorded five species of bats including: common pipistelle (*Pipistrellus pipistrellus*); soprano pipistrelle (*Pipistrellus pygmaeus*); Leisler's bat (*Nyctalus leisleri*); brown long-eared bat (*Plecotus auratus*); and a *myotis* species. The application site and its immediate surrounding area lie in an area identified as having a low index suitability for all bat species with a score of 25.11	The application site does not support any buildings, structures, trees or features (i.e. fissure or crevices in the quarry walls) that are considered to offer potential and/or suitable bat roosting opportunities. The application site is assessed as providing low habitat suitability for commuting and foraging bats and which has limited connectivity to areas of higher habitat suitability in the wider landscape. Bat activity surveys recorded low levels of bat activity of four species of bat at the application site including Natterer's bat, Leisler's bat, common pipistrelle and soprano pipistrelle. Common and soprano pipistrelles were the most common bat species recorded. The full Bat Survey and Evaluation Report is provided at Appendix 6D.	Local (higher)	All bat species are fully protected under the Wildlife Act 1976 (as amended) and the EC (Birds and Natural Habitats) Regulations 2011 (as amended). Site provides negligible roosting opportunities for bats. The application provides some foraging habitat for at least four bat species, but is generally of low quality. The application site is unlikely to be important or critical to any particular species of bat, or for the maintenance of the local population status of any bat species.
Other mammal species	NBDC returned four records for fox (*Vulpes vulpes*), two records for hedgehog (*Erinaceus europaeus*) and one record for Irish hare (*Lepus timidus subsp. Hibernicus*) and	During the Habitat Survey no mammals were observed within the application site. Whilst the site has the potential to support a number of other small mammals, no evidence	Local (lower)	Site provides some localised value to small mammals but is not likely to be critical in maintaining the local population status of any particular species

Species	Desk-based Study	Description of Use or Likely Use of the Application Site	Level of Value	Rational
	brown rat (*Rattus norvegicus*), an invasive species listed the European Communities (Birds and Natural Habitats) Regulations 2011, within the 2km search area. None of these records relate to the application site or its immediate surrounding area.	was found to indicate the presence of any protected species of mammal.		
Birds				
Bird assemblage	NBDC returned records for 36 species of birds for the search area. None of these species are listed under Annex I of the EU Birds Directive. Historically, peregrine falcon (*Falco peregrinus*) have been recorded at and breeding at the quarry within the application site.	The habitats present in the application site provide opportunities for a range of birds associated with farmland and those species that utilised quarry sites. During the Habitat Survey a total of 12 species of birds were recorded visually and/or aurally at and in the vicinity of the application site. Of the species recorded peregrine falcon is listed under Annex I of the EU Birds Directive. None of the bird species recorded are red listed[9] or	Local (lower)	Protected under the Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000. Peregrine falcon are breeding at the existing quarry as a result of the habitat created through quarrying operations. The application site provides breeding and foraging opportunities for a range of typically common and widespread species associated with quarries and farmland but is not likely to be important or critical for any particular individual species or local populations of birds given the availability of

[9] Red list species are those that are Globally Threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a s substantial recovery

Species	Desk-based Study	Description of Use or Likely Use of the Application Site	Level of Value	Rational
		amber listed[10] Birds of Conservation Concern in Ireland (BoCCI)[11]. A full list of the birds recorded during the Habitat Survey and their conservation status is provided at Appendix 6B.		alternative habitat in the wider surrounding area.
Reptiles				
Common lizard	NBDC returned no records for common lizard (*Zootoca vivipara*) within the search area.	Although common lizard is a species that can be found in wide range of habitats, the application site provides sub-optimum habitat for this species. No common lizards were observed during the Habitat Survey and it is considered that this species is not likely to be present at this site.	Not applicable	All reasonable likelihood of absence
Amphibians				
Common Frog and Smooth Newt	NBDC returned no records for common frog (*Rana temporaria*) or smooth newt (*Lissotriton vulgaris*) within the search area.	The application site and the immediate surrounding area does not provide any potential breeding habitat for amphibians.	Not applicable	All reasonable likelihood of absence

[10] Amber list species are those with an unfavourable conservation status in Europe; those whose population or range has declined moderately in recent years; those whose populations has declined historically but made a substantial recovery; rare breeders; and those with international important or localised populations.
[11] Gilbert G, Stanbury A and Lewis L. (2021). *Birds of Conservation Concern in Ireland 2020 –2026*. Irish Birds 43: 1–22

Species	Desk-based Study	Description of Use or Likely Use of the Application Site	Level of Value	Rational
		During the Habitat Survey no amphibians were recorded and it is considered not likely that common frog and smooth newt are present at this site.		
Invertebrates				
Invertebrates	NBDC did not return any records for any other rare or notable species of invertebrates within the search area	During the Habitat Survey no rare or notable species of invertebrate were observed within the application. Whilst no site is without invertebrate interest, it is considered not likely, given the habitat types, that the application site would support any protected invertebrate species.	Local (lower)	The site provides potential habitat for a wide range of invertebrates but is unlikely to be important or critical to any particular species or taxonomic group given the availability of alternative habitat in the wider surrounding area.
Other Important Species				
Other species not identified above	NBDC did not return any records for any other rare or notable species within the search area	During the Habitat Survey, no other protected, rare or notable species were recorded. Though the application site may support low numbers of common and widespread species it is considered highly unlikely that any other specially protected species would be present based on the habitats present.	Not applicable	All reasonable likelihood of absence

Summary of Important Ecological Features

6.42 In accordance with the CIEEM guidelines only ecological features considered to be important should be carried forward to any detailed assessment. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable. Therefore where receptors have been evaluated at a value of '*Local (lower)*' no further assessment is deemed necessary as the impact on these receptors is not likely to be of significance. However, where protected species are present and there is a potential for a breach in wildlife legislation then these species are considered as important ecological features regardless at what level they have been evaluated.

6.43 Based on the above, the identified important ecological features with the potential to be affected by proposed extension to the limestone quarry at Ardgaineen and carried forward for further ecological impact assessment are detailed in Table 6.8.

Table 6.8: Identified Important Ecological Features

Key Feature	Important Ecological Feature	Evaluation
Species	Bats	Local (higher)
	Bird assemblage	Local (lower)

Potential Effects

6.44 This section assesses the ecological impacts from the proposed extension to the limestone quarry at Ardgaineen on important ecological features identified from the preliminary desk-based study, baseline surveys and evaluation of the ecological features. Both qualitative and quantitative information has been used to identify likely significant ecological impacts, including the positive, negative, direct, indirect and the cumulative environmental effects.

6.45 To assess the effects of the proposed scheme it is essential that the impacts that could arise are identified and characterised. The impacts that require consideration in the EcIA are based upon knowledge of the proposed development and of the important ecological features. This can only be undertaken with a thorough understanding of ecological processes and how flora and fauna react to the range of impacts that could occur.

Proposed Development

6.46 A detailed description of the development is presented in Chapter 3 of the EIAR, but in summary the project relates to a planning application for the extension to an existing operational limestone quarry in the townland of Ardgaineen within an overall application area of c. 12ha. Planning permission specifically sought for the following:

- extraction of rock from an area consisting of 4.35ha which was previously subject to rock extraction and all associated facilities/works to a final floor level of 4 mOD;
- lateral extension of the existing permitted quarry area over c.6.1ha. area to a final floor level of 4 mOD;
- restoration of the application area to natural habitat after uses following completion of extraction;

- all related ancillary development and associated site works including processing (crushing, screening and washing) and stockpiling of materials; provision of landscaped screening berms and all other related activities; and
- the proposed development is within an overall application area of c. 12ha and is for a total period of 25 years.

6.47 The extraction system will continue to use blasting to fragment the limestone prior to its processing using mobile crushing and screening plant within the quarry void. Processed rock will be stored in the existing permitted quarry area pending use in the ancillary manufacturing plants (asphalt, block, concrete) on site or sale off site.

6.48 Upon cessation of extraction operations the site will be restored to natural habitats.

Identification and Characterisation of Potential Impacts

6.49 The potential ecological impacts from the proposed extension to the limestone quarry at Ardgaineen fall into two main categories:

- impacts arising from the operation of the limestone (operational phase); and
- impacts arising from the restoration of the site (post-operational phase).

6.50 No distinction has been made between any preparation of the site (construction phase) and the operational phase as any stripping of vegetation and top-soils / overburden will be carried out on a phased approach and on a '*as required*' basis as part the phasing of the overall development and as such is considered to form part of any on-going extraction of limestone at this site.

Potential Impacts and Interaction with Important Ecological Features (Operational Phase)

6.51 The sources of potential impacts arising from the proposed extension to the limestone quarry at Ardgaineen and the relevant important ecological features which are likely or have the potential to be directly or indirectly affected from any particular impact source based on the potential zone of influence of the development, in the absence of mitigation are outlined in Table 6.9.

Table 6.9: Sources of Potential Impacts and Important Ecological Potentially Affected

Impact Source	Nature of Impact	Important Ecological Feature Potentially Affected
Habitat loss, damage and fragmentation	Habitat loss involves the direct destruction or physical take-up of vegetation, or the removal of other structures with conservation interest. Habitat loss may also occur indirectly as a result of a change in land-use or water management, for instance the drying-up of ponds or through induced successional events leading to a change in habitat type. Habitat fragmentation is concerned with spatial processes, such as negative edge effects (e.g. colonisation by 'aggressive' species or successional	Bats Bird assemblage

	changes) and dispersal problems that can become increasingly severe as habitat is lost and remaining habitat is divided into smaller units. Fragmented habitats are likely to be more vulnerable to external factors that may have a negative effect upon them; e.g. disturbance, and may be less resilient to change (including climate and management change) than connected habitats because colonising species may be unable to reach the habitat to re-colonise in the event of species loss. Habitat loss can have a direct impact on individual populations and assemblages of species result in the direct loss of individuals or populations of animal species, or indirectly by increasing levels of stress placed upon populations of some species through negative edge effects (e.g. predation pressure) and dispersal problems that can become increasingly severe as habitat is lost and remaining habitat is divided into smaller units. The zone of influence of the proposed development is assessed to be restricted to the application site and immediate adjacent areas only.	
Disturbance from human activity, noise and vibration	Increases in disturbance, as a result of human activity can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing. The response of individual species to increased levels of human disturbance will depend upon a number of factors including the sensitivity, reproductive status, previous exposure to human disturbance, behaviour during the event, species tolerance to disturbance, location in relation to the source, availability of alternative nearby habitat, and environmental factors (i.e. topography, vegetation and atmospheric conditions which can influence noise levels). The level of disturbance will also be dependent upon the existing ambient noise levels and maximum noise levels. <u>Noise</u> It is generally accepted that for noise, certain species or groups of species can be impacted upon up to a distance of up to 300m from its source for high level and discontinuous disturbance with these distances reducing for low level and/or continuous disturbance levels.	Bird assemblage

	Evidence suggests that in general wildlife, with the exception of the most sensitive species, will adjust and tolerate long-term increases in low-medium-level and continuous noises. Guidance published under AQTAG09[12] indicates that where noise levels are below 80dB LA_{max} and 55dB $LA_{eq,1hr}$ as measured at a nest site for birds or other feature used by wildlife it is considered unlikely that it will have an adverse impact on any such species. Visual Disturbance Visual disturbance from human activity can include the movement of people, machinery and plant and which can result in the disturbance of species by causing increased anxiety and flight due to perceived danger. The response to visual disturbance is highly variable between species, threat type and habituation to human contact and can typically range from 50 to 500m although for many species this is generally below 300m in open situations. Vibration Any blasting operations have the potential to generate vibration. Studies into the effects of blasting on nesting falcons indicate that quarry blasting initiated flight up to 500m from the point source of any blast. The maximum distances at which vibration from other operational sources may be just perceptible to humans is between 30 to 50m from its source and this is likely to be similar for most groups of species. Whilst it is generally recognised vibration can disrupt wildlife the effect of vibration are usually masked by other disturbance and noise. It is likely that any species sensitive to increase noise will also be sensitive to vibration whilst less sensitive species to noise are likely to tolerate levels of vibration.	

Potential Impacts and Interaction with Important Ecological Features (Post-Operational Phase)

6.52 No sources of potential significant adverse impacts are considered likely on important ecological features over and above those arising during the operational phase of the

[12] Ormerod, L., Goodlad, N. and Horton, K. (2005). A*QTAG09 – Guidance on the Effects of Industrial Noise on Wildlife*. Air Quality Technical Advisory Group

proposed development. The restoration of the site to natural habitats is likely to have a positive and beneficial effect on wildlife. The level and significance of any effects cannot be quantified at this current time for any individual or groups of species but are likely to be beneficial and positive at a Local (lower) value. As the effects from the restoration are considered likely to be generally positive, no further assessment is deemed necessary in respect of the post-operational phase.

Assessment of Effects and Mitigation Measures

6.53 Table 6.10 details the assessment of predicted effects on the identified and relevant important ecological features from the proposed extension to the limestone quarry at Ardgaineen and mitigation measures to prevent, reduce or offset any potential effects.

Table 6.10: Assessment of Effects on Identified and Relevant Important Ecological Features (Operational Phase)

Impact	Assessment of Effects	Significance of Impact Before and After Mitigation (Residual Impact)
Bats		
Habitat loss, damage and fragmentation	<u>Assessment of Effects</u> The proposed extension of the limestone quarry will not result in the loss of any known feature used by roosting bats or with the potential to be used by bats. The proposed extension of the limestone quarry will result in the direct loss, damage and disturbance of c.6.77ha of pastoral fields and c.820m of hedgerow boundaries. This loss represents approximately 2% of the core sustenance zone (CSZ) for common and soprano pipistrelles of foraging habitat, based on a on 2km radius around a communal roost, and <1% for Leisler's bat and Natterer's bat based on a 3km and 4km CSZ respectively[13]. The removal of hedgerow habitat is not predicted to result in any loss of important commuting route for any bat species. The loss of potential foraging and commuting habitat in the application site is not likely to have a significant effect on the CSZ for any bat species or on any important commuting route where the resilience and conservation status of any bat roost in the wider surrounding area would be impacted.	Not significant
	<u>Mitigation</u> No specific ecological mitigation is required as impact is assessed as not significant.	
Nesting Birds		
Habitat loss, damage and fragmentation	<u>Assessment of Effects</u> The proposed extension of the limestone quarry will result in the loss of c.6.6ha of farmland habitat with the potential to be used by birds for breeding and foraging purposes. However, it is considered that the	Not significant

[13] CSZs as defined In Collins, J. (ed.) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). Bat Conservation Trust, London.

Impact	Assessment of Effects	Significance of Impact Before and After Mitigation (Residual Impact)
	surrounding area has sufficient carrying capacity to accommodate any displaced birds. It is therefore assessed that the loss of habitats is not likely to adversely affect the local population status of any birds species as a direct or indirect result of the extension of the limestone quarry.	
	<u>Mitigation:</u> No specific ecological mitigation is required as impact is assessed as not significant. However, mitigation measures are required to ensure compliance with Wildlife Act 1976 (as amended) prohibiting the killing, injuring or taking; the damage, destruction or taking of nests in use or being built; and the taking or destruction of eggs, where any nest sites are found to be present in areas proposed to be stripped of vegetation. To avoid destruction of any such nests all trees, shrubs and ground vegetation with the potential to support nesting birds will be removed outside the bird breeding season wherever practically possible in light of good forestry practice. However, if any vegetation clearance take place during the bird breeding season (March to the end of August) the area will be inspected for any evidence of nesting activity by an experienced ecologist / ornithologist. Any identified nest will be marked and an appropriately sized exclusion zone for the relevant species delineated around all such nest site(s). No vegetation clearance will be permitted within any exclusion zone until such time as the young have fledged and left the nest. Given the likely nesting species at this site the exclusion zone is unlikely to exceed beyond a 20m radius of any nesting site.	
Disturbance from noise and human activity	<u>Assessment of Effects:</u> The noise generated from the existing quarrying operations is typically below 55dB. During the stripping of topsoil and overburden there may be a temporary elevation in ambient noise levels over 55dB returning to below 55dB during quarrying operations. Although baseline noise levels are not predicted to change the direction of any noise, visual disturbance and vibration will change. No noise sensitive species of bird or which may be especially sensitive to other types of human disturbance were recorded as present in the proposed quarry extension area. Given that the species recorded as present in the application area are already likely to be habituated to noise, other human disturbance and vibration	Not significant

Impact	Assessment of Effects	Significance of Impact Before and After Mitigation (Residual Impact)
	from the existing quarry, no likely significant effects on the overall population status is on any bird species at and within the local surrounding area from the proposed extension of quarrying operations.	
	<u>Mitigation:</u> The current measures employed by the quarry to ensure the protection of breeding peregrine will continue to be implemented including ensuring an adequate buffer zone is maintained between any blasting / extraction of rock and active nesting site.	

Ecosystem Services

6.54 The habitats in the application site provide some provisioning, regulating and supporting services. These include amongst other things:

- Provisioning: grassland providing forage for livestock;
- Regulating: grassland providing water regulation and recharging of aquifers,
- Regulating: hedgerows providing carbon sequestration; and
- Supporting: grassland assisting in soil formation.

6.55 However, the scale and nature of the habitats in the application site is limited and therefore the ecosystem services provided is not likely to be significant or important in the locality of the existing quarry site or immediate wider surrounding area.

Cumulative Effects

6.56 A review of available planning information identified no permitted or under-construction projects in close proximity that would act in-combination to give rise to significant biodiversity effects. One proposed wind energy project (Laurclavagh Renewable Energy Development), located c. 2.4 km from the application site, was identified through desk-based review of planning registers and the project's NIS/EIAR documentation for in-combination consideration.

6.57 **Pathways:** The quarry extension does not introduce turbines, aviation lighting or overhead lines; therefore there is no shared collision pathway for birds or bats. Potential shared pathways are limited to temporary construction disturbance (noise/human presence) and, in theory, hydrological links.

6.58 **Wind farm residuals:** The wind farm's reports (2024) conclude no significant residual effects on European Sites and no cumulative hydrological/hydrogeological effects with other plans/projects; operational disturbance sources are limited, with reinstatement following construction.

6.59 **Quarry residuals:** This EIAR finds no significant residual effects on bats or birds (including peregrine) from the extension: no roost loss, low bat activity, poor on-site connectivity, and standard good-practice lighting.

6.60 **Overlap and separation:** At ~2.4 km separation, and given the quarry's established baseline and the wind farm's limited operational disturbance, any temporal overlap of construction would not create additive disturbance sufficient to affect local bat populations or peregrine breeding success. There is no hydrological pathway from the quarry extension that would alter habitats supporting qualifying interests.

6.61 **Conclusion:** On the evidence available, the proposed quarry extension does not contribute to in-combination significant effects on biodiversity with the identified wind energy project or other plans/projects.

Ecological Enhancement and Compensation

6.62 It is proposed that the screening berm along the northern and southern boundary of the proposed quarry extension area will be landscaped and planted with some trees to

compensate for the hedgerows that will be lost as part of the extension of quarrying operations.

6.63 Consideration will also be made to retain and enhance any other existing hedgerows along the boundary of the quarry extension area using supplementary planting of appropriate tree species.

Monitoring

6.64 No specific ecological monitoring is deemed necessary prior to the onset of quarrying operation or during quarrying operations in extension area.

Legal and Policy Implications

Legal Implications

6.65 The proposed extension of the limestone quarry at Ardgaineen has no implications for any statutory designated nature conservation sites.

6.66 The only statutory protected species with relevance to the proposed extension of the limestone quarry are breeding birds. However, provided that appropriate mitigation strategies are put in place it will be possible for the proposed quarry extension at Ardgaineen to be carried out without the risk of breaching current wildlife legislation.

Policy Implications

6.67 Hedgerows and stone walls are identified as features in the Galway County Development Plan under policies *NHB 5: Ecological Connectivity and Corridors* and *TWHS 1: Trees, Hedgerows, Natural Boundaries and Stone Walls*. Although the hedgerows and associated stone walls within the application area for the extension of the limestone at Ardgaineen may form part of the ecological network they are not considered important due to their structure, species-composition and historical significance. Proposed landscape tree planting and the enhancement of retained hedgerows along the boundaries of the application site where present will ensure that any loss of hedgerows / stone walls will be in compliance with current planning policies relating to biodiversity.

6.68 Provided all appropriate mitigation measures to ensure the compliance with the Wildlife Act 1976 (as amended) in respect to breeding birds it is considered that the proposed extension to the limestone quarry at Ardgaineen will comply with the requirements of current national, regional and local planning policies relating to protected species.

Residual Effects

6.69 The proposed extension of the limestone at Ardgaineen will result in loss of approximately 6.77ha of improved agricultural grassland, 820m of hedgerow and 916m of stone wall that will have a residual negative effect on these habitats at a Local (lower) level.

6.70 No significant residual effects on the bat assemblage (Local [higher]) or bird assemblage (Local [lower]) are predicted.

FIGURES

NOTES

LEGEND

- APPLICATION SITE

HABITATS

- ED4 - ACTIVE QUARRIES AND MINES
- GA1 - IMPROVED AGRICULTURAL GRASSLAND
- GS2 - DRY MEADOWS AND GRASSY VERGES
- WS1 - SCRUB
- WS2 - IMMATURE WOODLAND

Linear Habitats

- BL1 - STONEWALLS
- WL1 - HEDGEROWS / BL1 STONEWALLS
- HEDGEROW ASSESSMENT REFERENCE

QUARRY CONSULTING

PROPOSED LATERAL EXTENSION TO AN EXISTING LIMESTONE QUARRY AT ARDGAINEEN, CLAREGALWAY, CO. GALWAY

HABITAT PLAN

FIGURE 6.1

QC-24.003

Scale 1:2,000 @ A3

Date AUGUST 2024

APPENDICES

APPENDIX 6A: LOCAL POLICIES RELEVANT TO BIODIVERSITY

Policy / Objective	Description
Natural Heritage and Biodiversity	
NHB 1: Natural Heritage and Biodiversity of Designated Sites, Habitats and Species	Protect and where possible enhance the natural heritage sites designated under EU Legislation and National Legislation (Habitats Directive, Birds Directive, European Communities (Birds and Natural Habitats) Regulations 2011 and Wildlife Acts) and extend to any additions or alterations to sites that may occur during the lifetime of this plan. Protect and, where possible, enhance the plant and animal species and their habitats that have been identified under European legislation (Habitats and Birds Directive) and protected under national Legislation (European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011), Wildlife Acts 1976-2010 and the Flora Protection Order (SI 94 of 1999). Support the protection, conservation and enhancement of natural heritage and biodiversity, including the protection of the integrity of European sites, that form part of the Natura 2000 network, the protection of Natural Heritage Areas, proposed Natural Heritage Areas, Ramsar Sites, Nature Reserves, Wild Fowl Sanctuaries (and other designated sites including any future designations) and the promotion of the development of a green/ ecological network.
NHB 2: European Sites and Appropriate Assessment	To implement Article 6 of the Habitats Directive and to ensure that Appropriate Assessment is carried out in relation to works, plans and projects likely to impact on European sites (SACs and SPAs), whether directly or indirectly or in combination with any other plan(s) or project(s). All assessments must be in compliance with the European Communities (Birds and Natural Habitats) Regulations 2011. All such projects and plans will also be required to comply with statutory Environmental Impact Assessment requirements where relevant.
NHB 3: Protection of European Sites	No plans, programmes, or projects etc. giving rise to significant cumulative, direct, indirect or secondary impacts on European sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects.
NHB 4: Ecological Appraisal of Biodiversity	Ensure, where appropriate, the protection and conservation of areas, sites, species and ecological/networks of biodiversity value outside designated sites. Where appropriate require an ecological appraisal, for development not directly connected with or necessary to the management of European Sites, or a proposed European Site and which are likely to have significant effects on that site either individually or cumulatively.

Policy / Objective	Description
NHB 5: Ecological Connectivity and Corridors	Support the protection and enhancement of biodiversity and ecological connectivity in non-designated sites, including woodlands, trees, hedgerows, semi-natural grasslands, rivers, streams, natural springs, wetlands, stonewalls, geological and geo-morphological systems, other landscape features and associated wildlife areas where these form part of the ecological network and/or may be considered as ecological corridors in the context of Article 10 of the Habitats Directive.
NHB 7: Mitigation Measures	Require mitigating measures in certain cases where it is evident that biodiversity is likely to be affected. These measures may, in association with other specified requirements, include establishment of wildlife areas/corridors/parks, hedgerow, tree planting, wildflower meadows/marshes and other areas. With regard to residential development, in certain cases, these measures may be carried out in conjunction with the provision of open space and/or play areas.
NHB 9: Protection of Bats and Bats Habitats	Seek to protect bats and their roosts, their feeding areas, flight paths and commuting routes. Ensure that development proposals in areas which are potentially important for bats, including areas of woodland, linear features such as hedgerows, stonewalls, watercourses and associated riparian vegetation which may provide migratory/foraging uses shall be subject to suitable assessment for potential impacts on bats. This will include an assessment of the cumulative loss of habitat or the impact on bat populations and activity in the area and may include a specific bat survey. Assessments shall be carried out by a suitably qualified professional and where development is likely to result in significant adverse effects on bat populations or activity in the area, development will be prohibited or require mitigation and/or compensatory measures, as appropriate. The impact of lighting on bats and their roosts and the lighting up of objects of cultural heritage must be adequately assessed in relation to new developments and the upgrading of existing lighting systems.
Water Resources	
WR1: Water Resources	Protect the water resources in the plan area, including rivers, streams, lakes, wetlands, springs, turloughs, surface water and groundwater quality, as well as surface waters, aquatic and wetland habitats and freshwater and water dependant species in accordance with the requirements and guidance in the EU Water Framework Directive 2000 (2000/60/EC), the European Union (Water Policy) Regulations 2003 (as amended), the River Basin District Management Plan 2018 – 2021 and other relevant EU Directives, including associated national legislation and policy guidance (including any superseding versions of same) and also have regard to the Freshwater Pearl Mussel Sub-Basin Management Plans.
Wetlands, Turloughs, Watercourses	

Policy / Objective	Description
WTWF 1: Wetland Sites	Protect and conserve the ecological and biodiversity heritage of the wetland sites in the County. Ensure that an appropriate level of assessment is completed in relation to wetland habitats that are subject to proposals which would involve drainage or reclamation that might destroy, fragment or degrade any wetland in the county. This includes lakes and ponds, turloughs, watercourses, springs and swamps, marshes, fens, heath, peatlands, some woodlands as well as some coastal and marine habitats. Protect Ramsar sites under The Convention on Wetlands of International Importance (especially as Waterfowl Habitat).
Peatlands	
P1: Protection of Peatlands	Ensure that peatland areas which are designated (or proposed for designation) as NHAs, SACs or SPAs are conserved for their ecological, climate regulation, education and culture, archaeological potential including any ancient walkways (toghers) through bogs.
P2: Best Practice in Peatland Conservation and Management	Work in partnership with relevant stakeholders on all suitable peatland sites to demonstrate best practice in sustainable peatland conservation, management and restoration techniques and to promote their heritage and educational value subject to Ecological Impact Assessment and Appropriate Assessment Screening, as appropriate.
Invasive Species	
IS 1: Control of Invasive Alien Invasive Species	It is a policy objective of the Planning Authority to support measures for the prevention and eradication of invasive species.
IS 2: Invasive Species Management Plan	Ensure that proposals for development do not lead to the spread or introduction of invasive species. If developments are proposed on sites where invasive species are currently or were previously present, an invasive species management plan will be required. A landscaping plan will be required for developments near water bodies and such plans must not include alien invasive species.
Trees, Woodlands, Hedgerows and Stone Walls	
TWHS 1: Trees, Hedgerows, Natural Boundaries and Stone Walls	Protect and seek to retain important trees, tree clusters and tree boundaries, ancient woodland, natural boundaries including stonewalls, existing hedgerows particularly species rich roadside and townland boundary hedgerows, where possible and replace with a boundary type similar to the existing boundary. Ensure that new development proposals take cognisance of significant trees/tree stands and that all planting schemes developed are suitable for the specific site and use suitable native variety of trees of Irish provenance and hedgerows of native species. Seek Tree Management Plans to ensure that trees are adequately protected during development and incorporated into the design of new developments.

Policy / Objective	Description
TWHS 2: Protection of Forestry	Protect all substantial areas of deciduous forest, other than areas of commercial forestry. Proposals for development in these areas should seek to interact with the landscape character of the forested areas and its limits while also enhancing the forested areas so as to increase biodiversity value.
Eskers	
ESK 1: Protection of Eskers	Protect and conserve the landscape, natural heritage and biodiversity value of esker systems in the county. Assess applications for quarrying and other proposed developments with reference to their status or relative importance, for example, amenity, landscape and scientific value in the context of the overall esker system.
Inland Lakes, Waterways	
IW 1: Inland Waterways	(a) Protect and conserve the quality, character and features of inland waterways by controlling developments close to navigable and non-navigable waterways in accordance with best practice guidelines. (b) Preserve, protect and enhance Galway's inland lakes and waterways for their amenity and recreational resource amenity. (c) Protect the riparian zones of watercourse systems throughout the County, recognising the benefits they provide in relation to flood risk management and their protection of the ecological integrity of watercourse systems and ensure they are considered in the land use zoning in Local Area Plans. (d) The Planning Authority will support in principle the development and upgrading of the Inland Waterways and their associated facilities in accordance with legislation, best practice and relevant management strategies, key stakeholders and bodies including Waterways Ireland. (e) Ensure all abstractions of water will be subject to assessment for compliance with the requirements of Article 6 of the Habitats Directive. (f) Seek to provide additional accesses to lake shores and rivers for public rights of way, parking and layby facilities, where appropriate. (g) Developments shall ensure that adequate soil protection measures are undertaken, where appropriate, including investigations into the nature and extent of any soil/groundwater contamination.
Green and Blue Infrastructure	
GBI 1: New Developments	Require all proposals for large scale development to contribute to the protection, management and enhancement of the existing green/blue infrastructure of the County and the delivery of new green/blue infrastructure, where appropriate by including a green/ blue infrastructure plan as an integral part of any planning application. This plan should identify environmental and ecological assets, constraints and opportunities and shall include proposals which protect, manage, and enhance the development of green infrastructure resources in a sustainable manner.

APPENDIX 6B: HEDGEROW APPRAISAL

Reference	Historical (a)	Species Diversity per 30m Section (b)	Structure, Construction and Associated Features (c)	Habitat Connectivity (d)	Landscape (E)	Overall Assessed Significance
H1	Score = 1 Internal Field Boundary	Score = 0 Hawthorn, Blackthorn, Bramble	Score = 1 Remnant stone wall <0.5m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low
H2	Score = 1 Internal Field Boundary	Score = 1 Hawthorn, Blackthorn, Elder, Bramble	Score = 2 Stone wall 1m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low
H3	Score = 1 Internal Field Boundary	Score = 0 Hawthorn, Blackthorn, Bramble Herb-Robert	Score = 1 Remnant stone wall <0.5m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low
H4	Score = 1 Internal Field Boundary	Score = 0 Hawthorn, Blackthorn, Bramble	Score = 1 Remnant stone wall <0.5m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low
H5	Score = 1 Internal Field Boundary	Score = 1 Hawthorn, Blackthorn, Bramble Lords-and-Ladies Herb-Robert	Score = 1 Remnant stone wall <0.5m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low
H6	Score = 1 Internal Field Boundary	Score = 0 Hawthorn, Blackthorn, Bramble	Score = 1 Remnant stone wall <0.5m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low
H7	Score = 1 Internal Field Boundary	Score = 0 Hawthorn, Blackthorn, Bramble Herb-Robert	Score = 1 Remnant stone wall <0.5m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low

Reference	Historical (a)	Species Diversity per 30m Section (b)	Structure, Construction and Associated Features (c)	Habitat Connectivity (d)	Landscape (E)	Overall Assessed Significance
H8	Score = 1 Internal Field Boundary	Score = 0 Hawthorn, Blackthorn, Bramble	Score = 2 Stone wall 0.75m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low
H9	Score = 1 Internal Field Boundary	Score = 0 Hawthorn	Score = 1 Remnant stone wall <0.5m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low
H10	Score = 1 Internal Field Boundary	Score = 1 Hawthorn, Blackthorn, Bramble Lords-and-Ladies Herb-Robert	Score = 2 Stone wall 0.75m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low
H11	Score = 1 Internal Field Boundary	Score = 0 Hawthorn, Blackthorn, Bramble	Score = 1 Remnant stone wall <0.5m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low
H12	Score = 1 Internal Field Boundary	Score = 0 Hawthorn, Blackthorn	Score = 1 Remnant stone wall <0.5m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low
H13	Score = 1 Internal Field Boundary	Score = 1 Hawthorn, Holly, Blackthorn, Elder, Bramble	Score = 1 Remnant stone wall <0.5m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low
H14	Score = 1 Internal Field Boundary	Score = 0 Hawthorn	Score = 1 Remnant stone wall <0.5m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low
H15	Score = 1 Internal Field Boundary	Score = 0 Hawthorn, Blackthorn, Bramble	Score = 1 Remnant stone wall <0.5m in height	Score = 2 Multiple links with other hedgerows	Score = 0	Low

APPENDIX 6C: SUMMARY OF BIRDS RECORDED DURING THE HABITAT SURVEY (APRIL 2024)

Scientific Name	Common Name	Annex I EU Birds Directive	Red List	Amber List
Columba palumbus	Wood Pigeon	-	-	-
Corvus cornix	Hooded Crow	-	-	-
Corvus frugilegus	Rook	-	-	-
Corvus monedula	Jackdaw	-	-	-
Cyanistes caeruleus	Blue Tit	-	-	-
Erithacus rubecula	Robin	-	-	-
Falco peregrinus	Peregrine Falcon	√	-	-
Fringula coelebs	Chaffinch	-	-	-
Parus major	Great Tit	-	-	-
Prunella modularis	Dunnock	-	-	-
Troglodytes troglodytes	Wren	-	-	-
Turdus merula	Blackbird	-	-	-

APPENDIX 6D: BAT SURVEY AND EVALUATION REPORT

Extension to an Existing Limestone Quarry at Ardgaineen, Claregalway, Co. Galway

Bat Survey and Evaluation Report

August 2025

Harrington Concrete and Quarries

Reference: QC-24.003 v2.0

REVISION HISTORY

Date	Version	Issued To	Comments
July 2024	QC-24.003 ver 1.0	Quarry Consulting on behalf of Harrington Concrete and Quarries	Draft report issued to client for review and comment.
October 2024	QC-24.003 ver 1.1	Quarry Consulting on behalf of Harrington Concrete and Quarries	Final version
August 2025	QC-24.003 ver 2.0	Quarry Consulting on behalf of Harrington Concrete and Quarries	Draft report incorporating additional survey work issued to client for review and comment.
August 2025	QC-24.003 ver 2.0	Quarry Consulting on behalf of Harrington Concrete and Quarries	Final version

CONTRACT

This document has been prepared by Green & Blue Ecology for Harrington Concrete and Quarries to provide information of a bat survey as part of the proposed lateral extension to an existing limestone quarry at Ardgaineen, Claregalway, Co. Galway.

Prepared by: 

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Green & Blue Ecology

Date: August 2025

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CONTENTS

TABLES

FIGURES

1. INTRODUCTION

1.1. Background

This report presents the findings of the manual bat activity surveys carried out at the site of the proposed lateral extension of an existing limestone quarry at Ardgaineen, Claregalway, Co. Galway.

It has been prepared by Green & Blue Ecology on behalf of Harrington Concrete and Quarries to inform the Ecological Impact Assessment (EcIA) and Environmental Impact Assessment (EIA) process as part of the planning submission for the proposed lateral extension of an existing limestone quarry at Ardgaineen at the request of Galway County Council.

1.2. Legislation Context

All bat species are listed on Annex II and IV of European Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive) and a fully protected in Ireland under the Wildlife Act 1976 (as amended) and the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) making it an offence to:

- deliberately capture or kill a bat;
- deliberately disturb any individual or group of bats particularly during the period of breeding, rearing of young or hibernation;
- damage or destroy a breeding site or resting place of any individual or group of bats.

1.3. Survey Aims and Objectives

The aim of the surveys were to identify the level of bat usage of lands within the application site of the proposed quarry extension and provide an evaluation of the overall importance of the site for bat populations.

The key objectives of the survey were specifically to:

- confirm the likely presence / absence of any bat roosts within the study area and assess their likely usage and conservation significance if present;
- identify any other area of particular significance for bats, e.g. important foraging areas or commuting routes;
- assess the bat species present within the study area and provide evidence on their likely population size and distribution; and
- evaluate the bat interest of the site based on established criteria.

2. METHODOLOGY

Baseline ecological data were collated through a combination of desk-based study and field survey based on standard methodologies and published good practice guidelines by the Bat Conservation Trust (BCT)[1].

2.1. Study Area

The existing limestone quarry is located in the townland of Ardgaineen approximately 7.6 km north of Claregalway, Co. Galway.

The study area for the bat survey included all land within the application site for the proposed quarry extension covering approximately 12 hectares (ha) (Figure 1). The study area encompasses parts of the existing operational quarry used for the extraction of limestone and ten agricultural fields, or parts of fields, under permanent pasture (please refer to Figure 2).

2.2. Preliminary Ecological Appraisal for Bats

2.2.1. Desk-based Study

A desk-based study was undertaken on 9th June 2024 and involved collating data from a number of organisations and examining published data relating to the presence of bats at the site of the proposed quarry extension and within a 2km radius of the site. Data sources included any records held by the National Biodiversity Data Centre (NBDC)[2] and previous bat surveys carried out at this site by Earth Science Partnership Ireland Ltd in 2018 as part of a previous planning application for the quarry at Ardgaineen.

2.2.2. Daytime Bat Walkover

A preliminary ecological appraisal (PEA) of the application site for the quarry extension was carried out as part of the Habitat Survey carried out at this site on 18th April 2024 to assess and record any habitats suitable for bats to roost, commute and forage.

A further Daytime Bat Walkover (DBW) of the study area was undertaken on 21st July 2024 and a subjective assessment, based on the guidance in Table 1, was made on any feature with the potential to be used by roosting bats and on the surrounding landscape and its associated features on their likely importance as bat commuting routes and/or foraging habitat.

[1] Collins, J. (ed.) (2023). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition)*. Bat Conservation Trust, London.
[2] www.biodiversiy Ireland.ie

Table 1: Grading System for the Potential Suitability of Sites for Bats

Suitability	Description of Roosting Habitats	Description of Potential Commuting and Foraging Habitat
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices/suitable shelter at all ground / underground levels).	No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e. not habitats that provide continuous lines of shade / protection for flight-lines, or generate / shelter insect populations available to foraging bats).
Negligible	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion..	No obvious habitat features on site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity and not a classic cool / stable hibernation site, but could be used by individual hibernating bats).	Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape or other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as lone tree (not in a parkland situation) or patch of scrub.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed)	Continuous habitat connected to the wider landscape that could be used by bats for flight-paths such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger number of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support high conservation status roosts, e.g. maternity or classic cool / stable hibernation site.	Continuous, high-quality habit that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

2.3. Manual Bat Activity Surveys

Manual bat activity surveys of the study area were undertaken at dusk on 21st July 2024, dawn on 22nd July 2024 and dusk on 5th May 2025. Each survey comprised of a Night-time Bat Walkover (NBW) based on a transect encompassing as far as practically possible the whole of the study area, but especially areas of likely higher value for commuting and foraging bats. A number of listening stops (LS) were used at potentially important areas along the transect for bats with a minimum of two minutes of stationary recording undertaken at each station. In May 2025, the transect was extended to pass through the active quarry site. Figure 2 shows the transect routes and LS.

The dusk NBW commenced 30 minutes before local sunset time and continued for at least 2 hours after sunset. The dawn survey commenced 2 hours before sunrise and continued until local sunrise time.

Bat detection equipment used during the survey included an Echo Meter Touch 2 Pro detector attached to a mobile device to continuously record throughout the survey.

2.4. Survey Personnel

The surveys were led by Steve Judge of Green & Blue Ecology. Steve has over 24 years of experience in ecological and environmental consultancy and a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM) and is experienced in carrying out a range of bat surveys in the Republic of Ireland and throughout the UK and Northern Ireland.

2.5. Uncertainty of Data and Limitations

The existing operational quarry was not covered by the NBW transect in July 2024 primarily for health and safety reasons. However, parts of the quarry were surveyed in May 2025 and based on these findings it is considered that the inclusion of the operational quarry in July 2024 would not have significantly alter the findings of the survey given the quarry provides negligible bat habitat.

The use of structures, trees and other features or a particular area of land by bats can vary significantly not only on a seasonal basis but also from day to day. Therefore the lack of evidence of any one particular bat species does not necessarily preclude their presence on the site at a later date.

Myotis calls are difficult to distinguish on the basis of both echolocation and sightings due to the known parameters of this genus being broadly similar. Calls have been identified to species level wherever possible, by using archive examples to provide a comparative baseline. However, it is important to note that with such species there is the potential for a degree of interpretative error.

3. RESULTS

3.1. Contextual Information and Historical Records

3.1.1. Historical Records for Bats

NBDC returned a solitary record for pipistrelle (*Pipistrellis pipistrellis sensu lato*) within a 2km radius of the application site.

Lough Corrib Special Area of Conservation (SAC) has lesser horseshoe bat (*Rhinolophus hipposideros*) listed as a qualifying Annex II species. This Natura 2000 site lies approximately 2.4km east of the application site at its closest point. The closest record for lesser horseshoe bat is over 8km from the application site.

3.1.2. Previous Bat Surveys

A bat survey encompassing the application site was carried out by Earth Science Partnership Ireland Ltd in 2018. This survey recorded five species of bats including: common pipistelle (*Pipistrellus pipistrellus*); soprano pipistrelle (*Pipistrellus pygmaeus*); Leisler's bat (*Nyctalus leisleri*); brown long-eared bat (*Plecotus auratus*); and a *myotis* species.

3.2. General Habitat Description

The application site for the quarry extension encompasses parts of the existing operational quarry used for the extraction of limestone and ten agricultural fields, or parts of fields, under permanent pasture typically bounded by hedgerows and associated stone walls.

Some security lighting is present on the asphalt plant and other buildings / structures located in the quarry site however, the illumination from any lamps is limited to parts of the quarry only.

The surrounding landscape is characterised by agricultural land comprised of relatively small fields under permanent pasture with some hedgerow boundaries interspersed by small blocks of woodland. The N83 national road runs in a north to south direction approximately 1.4km to the east of the quarry site with a large number of local roads criss-crossing the local area with associated dispersed residential properties scattered along these roads and lanes.

The application site and its immediate surrounding area lie in an identified with a low index suitability for all bat species with a score of 25.11[3].

3.3. Preliminary Ecological Appraisal

3.3.1. Roosting Habitat

The application site and its immediate surrounding area is considered to provide negligible roosting opportunities for bats.

All buildings / structures associated with the quarry are of a construction and design that they have no features likely to be used by bats for roosting purposes.

The limestone quarry walls have some natural fissuring and crevices. However, these are considered not likely to provide appropriate conditions for roosting bats and due to high levels of disturbance from daytime quarrying operations. The quarry is therefore assessed as providing negligible roosting opportunities for bats.

3.3.2. Commuting and Foraging Habitat

The habitats within the application site are assessed as being of low suitability for commuting and foraging bats. Although there are a number of hedgerows at and adjacent the application site these are relatively

[3] https://www.biodiversityireland.ie

isolated and not well connected to other habitat patches of potential higher value for bats in the much wider surrounding area.

3.4. Summary of the Manual Bat Activity Surveys

A summary of the manual bat activity dates, timings and weather conditions is presented in Table 2.

Table 2: Manual Activity Dates, Timings and Weather Conditions

Date	Survey Type	Local Sunset / Sunrise Time	Timings	Weather Conditions
21/07/2024	NBW (dusk)	21:48	21:18 to 23:50	Start: temperature 16^{O}C, cloud cover 8/8, wind speed 1 (light air from south west), rain (none) but moderate showers earlier in the evening.. Finish: temperature 16^{O}C, cloud cover 8/8, wind speed 1 (light air from south west), rain 0 (none).
22/07/2024	NBW (dawn)	05:36	03:25 to 05:40	Start: temperature 16^{O}C, cloud cover 7/8, wind speed 1 (light air from south west), rain (none). Finish: temperature 18^{O}C, cloud cover 5/8, wind speed 1 (light air from south west), rain 0 (none).
05/05/2025	NBW (dusk)	21:09	20:34 to 23:09	Start: temperature 12^{O}C, cloud cover 2/8, wind speed 1 (light air from south east), rain (none). Finish: temperature 10^{O}C, cloud cover 2/8, wind speed 1 (light air from south east), rain 0 (none).

The manual activity surveys recorded relatively low levels of activity of four species of bat including: Natterer's bat, Leisler's bat, common pipistrelle and soprano pipistrelle. Table 3 provides of summary of each NBW.

Table 3: Manual Bat Activity Surveys – Summary of Results

Date	Summary of Results
21/07/2024 (NBW dusk)	The transect was walked in an anticlockwise direction starting and ending in the north west corner of the application site and stopping at each LS sequentially, i.e. LS1, LS2, LS3 etc. Two circuits of the transect were walked during the survey. No bats were recorded on the first circuit of the transect. The first bat recorded was a soprano pipistrelle at 22:39 (51 minutes after sunset) commuting over the quarry void in a north westerly direction. This was followed by a further soprano pipistrelle (heard not seen) at 22:48 (LS5) and at 22:51 (LS6). A common pipistrelle was recorded foraging (two passes) at LS9 at 23:08 and another commuting in a north easterly direction across open field at 23:20 that was the last bat recorded.

Date	Summary of Results
22/07/2024 (NBW dawn)	The transect was walked in a clockwise direction starting and ending in the north west corner of the application site and stopping at each LS initially sequentially, i.e. LS13, LS12, LS11 etc but route changed at LS10 to then sequentially LS4, LS5 etc to assess number of bats recorded. One circuit of the transect were walked during the survey. The first bat recorded was a common pipistrelle at 03:31 foraging at the intersection of hedgerows near LS2. This was followed by a commuting Leisler's bat flying in a south easterly direction over a gap in the hedgerow at 03:38 and a common pipistrelle foraging along a hedgerow west of LS3 from 03:45 to 03:47 (8 passes) and another across open field at 03:50. A soprano pipistrelle was then recorded foraging (3 passes) at LS13 at 03:52. At the end of the hedgerow and field gateway a soprano pipistrelle and common pipistrelle were recorded foraging at 04:04 and 04:05 respectively. A foraging common pipistrelle (heard not seen) was recorded between LS12 and LS11 at 04:09 and soprano pipistrelle commuting in an easterly direction at LS11 at 04:11. At 04:14 common pipistrelle recorded foraging (3 passes) along boundary of field and quarry and a detour of the transect taken to assess number of bats to LS4. Confirmation of one foraging bat (8 passes) to 04:17. Further bats observed along boundary of field and quarry included a Leisler's bat commuting in a north westerly direction at 04:14. At LS5 a foraging common pipistrelle and soprano pipistrelle were recorded at 04:19 and a further common pipistrelle at 04:21. Leisler's bat (heard not seen) was recorded foraging along the edge of the field north of LS5 at 04:25 and 04:27 (2 passes) with common pipistrelle also recorded along this point at 04:26. At LS7 a soprano pipistrel was heard not seen along with a Natterer's bat at 04:35. Natterer's bat was recorded foraging over open field at 04:39. At 04:42 a common pipistrelle was commuting in a northerly direction at the intersection of hedgerows to the north of LS7 with the last bat recorded a soprano pipistrelle (heard not seen) also at this location.
05/05/2025 (NBW dusk)	The transect started at the entrance to the quarry site, passing through the quarry and then walking the two circuits of the transect line used on 21/07/25 before returning through the quarry and finishing back at the entrance to the quarry. The first bat recorded was a Leisler's bat at 21:20 (11 minutes after sunset) commuting in a north easterly direction along the edge of the quarry between LS3 and LS4. A further Leisler's bat was recorded foraging at LS7 at 21:37 and 21:39. The first soprano pipistrelle was recorded foraging (2 passes) at the gateway near LS3 at 21:56 and was followed by another foraging (5 passes) on the approach to LS13 at 22:59 at LS7. Further foraging soprano pipistrelle activity was recorded between 22:03 and 22:04 (11 passes) at LS3 and at 22:17 (2 passes) at LS7. At 22:18 a Leisler's bat was recorded foraging on the approach to LS8. At 22:26 a soprano pipistrelle was recorded at the gateway near LS3 and was first joined by a foraging common pipistrelle and then a Leisler's bat. Common pipistrelle were then recorded foraging on route to LS2 at 22:34, at LS1 at 22:26 and on the northern edge of a overburden storage berm in the quarry itself. Within the quarry site a soprano pipistrelle was recorded commuting in a northerly direction at 22:42 and followed by the commuting common pipistrelle flying in an easterly direction. A further common pipistrelle was recorded foraging along the access road between 22:44 and 22:45 (3 passes) and was the last bat recorded.

Table 4 presents the total number of passes for each species of bat recorded for each NBW and the distribution of bats recorded are shown in Figures 3, 4 and 5 for each of the NBWs respectively.

Table 4: Total bat Passes per Species by Survey

Species	21/07/2024	22/07/2024	05/05/2025
Common pipistrelle	3	49	9
Soprano pipistrelle	3	6	26
Leisler's bat	0	4	5
Natterer's bat	0	3	0
Total:	**6**	**62**	**40**

4. INTERPRETATION AND EVALUATION

4.1. Evaluation of Bat Roost Status

The timing of the first bats recorded after dusk would indicate that that there are no bat roosts within the application site and is backed up by the DBW that assessed the application site for the proposed quarry extension at Ardgaineen as providing negligible roosting opportunities for bats.

4.2. Evaluation of Habitat Resource for Foraging and Commuting

The assessment of value of the application site for the quarry extension at Ardgaineen in terms of its habitat and its value to bats is based on Wray *et al*. (2010)[4] for determining a score for bat habitat values for both commuting and foraging habitat. Although developed for use in the UK and Northern Ireland, it is considered transferable to evaluating the value of bat habitats in Ireland.

It should be noted that the Wray *et a*l. system provides a framework that still requires the consideration of local factors and professional judgement to be made. The approach, for example, does not provide a definition of what constitutes '*small*' or *'large*' numbers of bats. Information on known colony sizes for each species has been used to assess whether the numbers of each species recorded using the application site should be treated as '*small*' or *'large*' numbers of bats when using the system. This includes referencing known roost sizes for each species in a local context. Also, in order to evaluate whether the population using the site is 'small' or 'large' it is important to consider the estimated (study area) population size, the size of the site being surveyed and relative status (commonness) of the bat species being evaluated. The evaluation also considers the likely usage of the site by such species, i.e. do they range over wide areas or tend to stay local to a roosting site based on their core sustenance zones (CSZ).

Table 5 provides an overview of the criteria and scoring system (scores in brackets) at taken from Wray *et a*l.

Table 5: Scoring System for Valuing Commuting and Foraging Habitats

Species	Number of Bats	Roosts / Potential Roosts Nearby	Type and Complexity of Commuting Routes	Foraging Habitat Characteristics
Common bat species (2)	Individual Bats (5)	None (1)	Absence of linear features (1)	Industrial or other site without established vegetation (1)
Rarer bat species (5)	Small number of bats (10)	Small number (3)	Un-vegetated fences and large field sites (2)	Suburban areas or intensive arable land (2)
Rarest bat species (20)	Large number of bats (20)	Moderate number / not known (4)	Walls, gappy or flailed hedgerows, isolated well-grown hedgers and moderate field sizes (3)	Isolated woodland patches, less intensively arable and/or small towns and villages (3)

[4] Wray, S., Wells, D., Long, E & Mitchell-Jones, E. (2010). *Valuing Bats in Ecological Impact Assessment*. In Practice 70: 23-25. December 2010, Chartered Institute of Ecology and Environmental Management.

Species	Number of Bats	Roosts / Potential Roosts Nearby	Type and Complexity of Commuting Routes	Foraging Habitat Characteristics
		Large number of roosts, or close to a nationally designated site for the species (5)	Well-grown and well connected hedgerows, small field sizes (4)	Larger or connected woodland blocks, mixed agriculture and small villages and hamlets (4)
		Close to or within a SAC for the species (20)	Complex network of mature well-established hedgerows, small fields and rivers / streams (5)	Mosaic of pasture, woodland and wetland areas (5)

The scores from the first three columns and taking the highest score obtained from commuting routes and foraging habitat columns are added together to determine the appropriate geographic from of reference used to evaluate value based on the scoring system in Table 6.

Table 6: Assigning a Geographic Frame of Reference

Geographic Frame of Reference	Score
International	>50
National	41 - 50
County	21 - 40
Local (Higher)	11-20
Local (Lower)	1 - 10

The application site is characterised as agricultural fields under permanent pasture typically bounded by hedgerows that is relatively isolated and not well connected to other potentially higher value habitats for bats in the much wider surrounding area.

Relatively low levels of activity of four species of bat were recorded during the survey. Common pipistrelle was the most frequent recorded species followed by soprano pipistrel, Leisler's bat and Natterer's bat.

A summary of the evaluation for each bat species recorded at the application site is provided in Table 7.

Table 7: Determination of Ecological Value of Bat Habitats for Individual Species for the Application Site at Ardgaineen

Species	Species Value	Number of Bats	Roosts / Potential Roosts Nearby	Type and Complexity of Commuting Routes	Geographic Frame of Reference and Score for Application Site
Common Pipistrelle	Common (2)	Individual Bats (5)	Small Number (3)	Walls, gappy or flailed hedgerows, isolated well-grown hedgers and moderate field sizes Isolated woodland patches, less intensively arable and/or small towns and villages (3)	Local (Higher) (13)
Soprano Pipistrelle	Common (2)	Individual Bats (5)	Small Number (3)	Walls, gappy or flailed hedgerows, isolated well-grown hedgers and moderate field sizes Isolated woodland patches, less intensively arable and/or small towns and villages (3)	Local (Higher) (13)
Leisler's Bat	Common (2)	Individual Bats (5)	Small Number (3)	Walls, gappy or flailed hedgerows, isolated well-grown hedgers and moderate field sizes Isolated woodland patches, less intensively arable and/or small towns and villages (3)	Local (Higher) (13)
Natterer's Bat	Rarer (5)	Individual Bats (5)	Small Number (3)	Walls, gappy or flailed hedgerows, isolated well-grown hedgers and moderate field sizes Isolated woodland patches, less intensively arable and/or small towns and villages (3)	Local (higher) (16)

5. CONCLUSIONS

The manual bat activity surveys recorded a total of four species of bat using the applications site for the proposed extension of the existing limestone quarry at Ardgaineen, including: Natterer's Bat, Leisler's bat common pipistrelle and soprano pipistrelle with relatively low levels of activity of individual bats recorded for each of these species.

Based on the evidence available, it is considered that the application site does not support any bat roosts.

The habitat resource for commuting and foraging bats at the application site is evaluated at Local (higher) value for all species recorded.

FIGURES

NOTES

LEGEND

APPLICATION SITE / STUDY AREA

QUARRY CONSULTING

PROPOSED LATERAL EXTENSION TO AN EXISTING LIMESTONE QUARRY AT ARDGAINEEN, CLAREGALWAY, CO. GALWAY

BAT SURVEY AND EVALUATION LOCATION OF THE STUDY AREA

FIGURE 1

Scale 1:50,000 @ A3

Date AUGUST 2025

QC-24.003

NOTES

1. Night-time Bat Walkover surveys started and ended at Listening Stop 1.

LEGEND

- Application Site / Study Area
- Transect
- Listening Stop

QUARRY CONSULTING

PROPOSED LATERAL EXTENSION TO AN EXISTING LIMESTONE QUARRY AT ARDGAINEEN, CLAREGALWAY, CO. GALWAY

BAT SURVEY AND EVALUATION
TRANSECT ROUTE & LISTENING STOPS

FIGURE 2

Scale	Date
1:2,000 @ A3	AUGUST 2025

QC-24.003

NOTES

1. Night-time Bat Walkover surveys started and ended at Listening Stop 1.

LEGEND

- Application Site / Study Area
- Transect
- Listening Stop

BAT SPECIES

- Common Pipistrelle
- Soprano Pipistrelle

QUARRY CONSULTING

PROPOSED LATERAL EXTENSION TO AN EXISTING LIMESTONE QUARRY AT ARDGAINEEN, CLAREGALWAY, CO. GALWAY

BAT SURVEY AND EVALUATION
BAT ACTIVITY ON 21/07/2024 (DUSK)

FIGURE 3

Scale	Date
1:2,000 @ A3	AUGUST 2025

QC-24.003

NOTES

1. Night-time Bat Walkover surveys started and ended at Listening Stop 1.

LEGEND

- Application Site / Study Area
- Transect
- Listening Stop

BAT SPECIES

- 22/07/2024, Common Pipistrelle
- 22/07/2024, Leisler's Bat
- 22/07/2024, Natterer's Bat
- 22/07/2024, Soprano Pipistrelle

QUARRY CONSULTING

PROPOSED LATERAL EXTENSION TO AN EXISTING LIMESTONE QUARRY AT ARDGAINEEN, CLAREGALWAY, CO. GALWAY

BAT SURVEY AND EVALUATION
BAT ACTIVITY ON 22/07/2024 (DAWN)

FIGURE 4

Scale	Date
1:2,000 @ A3	AUGUST 2025

QC-24.003

NOTES

1. Night-time Bat Walkover survey started and ended at the entrance of the quarry.

LEGEND

- Application Site / Study Area
- Transect
- Transect Extension
- Listening Stop

BAT SPECIES

- 05/05/2025, Common Pipistrelle
- 05/05/2025, Leisler's Bat
- 05/05/2025, Myotis
- 05/05/2025, Soprano Pipistrelle

QUARRY CONSULTING

PROPOSED LATERAL EXTENSION TO AN EXISTING LIMESTONE QUARRY AT ARDGAINEEN, CLAREGALWAY, CO. GALWAY

BAT SURVEY AND EVALUATION
BAT ACTIVITY ON 05/05/2025 (DUSK)

FIGURE 5

Scale	Date
1:3,000 @ A3	AUGUST 2025

QC-24.003