

6.

## BIODIVERSITY

6.1

### Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) assesses the likely direct and indirect significant effects (both alone and cumulatively with other projects) that the proposed quarry at Lomaunaghbaun may have on Biodiversity and sets out the mitigation measures proposed to avoid, reduce, or offset any potential significant effects that are identified. The assessment has a particular focus on species and habitats with national and international protection under the EU Habitats Directive (92/43/EEC) (together with the Birds Directive (79/409/EEC), as subsequently codified by Council Directive 2009/147/EC on the conservation of wild birds) (*i.e.* the Habitats and Birds Directives) and the Wildlife Acts 1976 (as amended). The full description of the Proposed Development is provided in Chapter 4 of this EIAR.

6.1.1

### Purpose and Structure of this Chapter

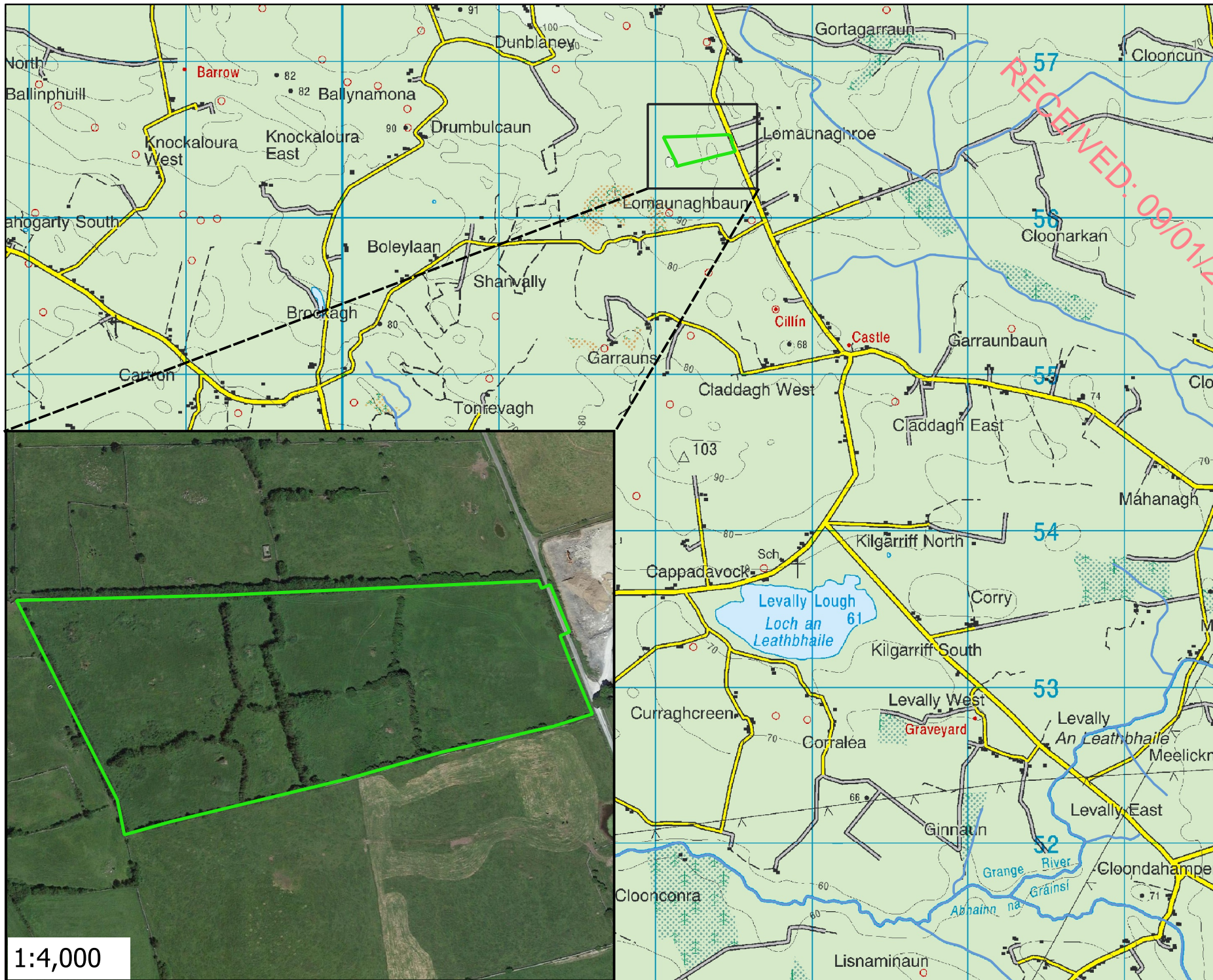
The purpose of this chapter is to assess the potential for impacts on biodiversity.

The chapter is structured as follows:

- The Introduction provides a description of the legislation, guidance, and policy context applicable to Biodiversity.
- This is followed by a comprehensive description of the ecological survey and impact assessment methodologies that were followed to inform the robust assessment of likely significant effects on ecological receptors.
- A description of the Baseline Ecological Conditions and Receptor Evaluation is then provided.
- This is followed by an Assessment of Effects which are described with regard to each phase of the development: construction phase, operational phase and decommissioning phase. Potential cumulative effects in combination with other projects are fully assessed.
- Proposed mitigation and best practice measures to avoid, reduce or offset the identified effects are described and discussed. This is followed by an assessment of residual effects taking into consideration the effect of the proposed mitigation and best practice measures.
- The conclusion provides a summary statement on the overall significance of predicted effects on Biodiversity.

The following defines terms utilised in this chapter:

- For the purposes of this EIAR, the proposed quarry at Lomaunaghbaun is referred to as the 'Proposed Development'.
- For the purpose of this EIAR, the term 'EIAR Site Boundary' as outlined in Chapter 1 of this EIAR or 'Site' refers to the study area for this EIAR, comprising the entire area shown in Figure 6-1.
- For the purposes of this Biodiversity Chapter, 'Construction phase' refers to site enabling works which include the construction of the site infrastructure and processing plant. The 'Operational phase' refers to the proposed extraction works within the quarry.
- The area actually covered by the Proposed Development is referred to as the 'Development Footprint'.
- "Key Ecological Receptor" (KER) is defined as a species or habitat occurring within the zone of influence of the development upon which likely significant effects are anticipated.
- "Zones of Influence" (ZoI) for individual ecological receptors refers to the zone within which potential effects are anticipated. ZoIs differ depending on the sensitivities of particular habitats and species and were assigned in accordance with best available guidance and through adoption of a precautionary approach.



## Map Legend

- Site Boundary
- WFD Watercourses



Drawing Title

## Site Location

Project Title	
Lomaunaghbaun Quarry, Lomaunaghbaun, Tuam, Co. Galway	
Drawn By	Checked By
DM	SC
Project No. 211034	Drawing No. 6-1
Scale 1:32,000	Date 30/11/2023



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## Legislation and Policy

### National Legislation

The Wildlife Act, 1976 (as amended), is the principal piece of legislation governing protection of wildlife in Ireland. The Wildlife Act provides strict protection for species of conservation value. The Wildlife Act conserves wildlife (including game) and protects certain wild creatures and flora. These species are therefore considered in this report as ecological receptors. Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites. Only NHAs are designated under the Wildlife (Amendment) Act 2017. These sites do not form part of the Natura 2000 network of European sites and the AA process, or screening for same, does not apply to NHAs or pNHAs. Proposed Natural Heritage Areas (pNHAs) were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated<sup>1</sup>. However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future (NPWS, 2020).

The Flora (Protection) Order, 2022 (S.I. No. 235 of 2022) lists the species, hybrids and/or subspecies of flora protected under Section 21 of the Wildlife Acts. It provides protection to a wide variety of protected plant species in Ireland including vascular plants, mosses, liverworts, lichens and stoneworts. Under the Flora Protection Order it is illegal to cut, pick, collect, uproot or damage, injure or destroy species listed or their flowers, fruits, seeds or spores or wilfully damage, alter, destroy or interfere with their habitat (unless under licence).

In addition to the above, the following legislation applies with respect to habitats, fauna and water quality in Ireland and has been considered in the preparation of this report:

- The International Convention on Wetlands of International Importance especially Waterfowl Habitat (Concluded at Ramsar, Iran on 2 February 1971)
- S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 and S.I. No. 722 of 2003 European Communities (Water Policy) Regulations 2003 which give further effect to EU Water Framework Directive (2000/60/EC).
- Planning and Development Acts 2000 – 2023.

The following legislation applies with respect to non-native species:

- Regulation 49 and 50 of European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011).

This assessment has been prepared with respect to the various planning policies and strategy guidance documents listed below:

- Galway County Development Plan 2022-2028
- National Biodiversity Action Plan 2017-2021
- Draft National Biodiversity Action Plan 2023 - 2027

### National Policy

The National Biodiversity Action Plan 2017-2021 (Department of Culture, Heritage and the Gaeltacht, 2021) (the “Plan”) demonstrates Ireland’s continuing commitment to meeting and acting on its obligations to protect Ireland’s biodiversity for the benefit of future generations through a series of targeted strategies and actions. The main objective of the Plan is to bring biodiversity into the mainstream of policy and decision-making. Objective 1 (*Mainstream biodiversity into decision-making across all sectors*) of the Plan identifies the following relevant measures in relation to future developments:

<sup>1</sup> <https://www.npws.ie/protected-sites/nha> (accessed 23 January 2023).

- “Incorporate into legislation the requirement for consideration of impacts on biodiversity to ensure that conservation and sustainable use of biodiversity are taken into account in all relevant plans and programmes and relevant new legislation;
- Public and Private Sector relevant policies will use best practice in SEA, AA and other assessment tools to ensure proper consideration of biodiversity in policies and plans;
- All Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure;
- Strengthen ecological expertise in local authorities and relevant Government Departments and agencies;
- Local Authorities will review and update their Biodiversity and Heritage Action Plans;
- Local Authorities will review and update their Development Plans and policies to include policies and objectives for the protection and restoration of biodiversity;
- Develop a Green Infrastructure at local, regional and national levels and promote the use of nature-based solutions for the delivery of a coherent and integrated network;
- Continue to produce guidance on the protection of biodiversity in designated areas, marine and the wider countryside for Local Authorities and relevant sectors;
- Integrate Natura 2000 and Biodiversity financial expenditure tracking into Government Programmes internal paying agency management procedures including linkage to the Prioritised Action Framework and this NBAP;
- Develop a Natural Capital Asset Register and national natural capital accounts by 2020, and integrate these accounts into economic policy and decision-making;
- Initiate natural capital accounting through sectoral and small-scale pilot studies, including the integration of environmental and economic statistics using the framework of the UN System of Experimental-Ecosystem Accounting (SEEA);
- Establish a national Business and Biodiversity Platform under the CBD’s Global Business Partnership;
- Ensure Origin Green produces tangible benefits for biodiversity with increased emphasis on conservation and restoration of biodiversity;
- Implement actions from Ireland’s Biodiversity Climate Change Sectoral Adaptation Plan;
- Identify and take measures to minimise the impact of incentives and subsidies on biodiversity loss, and develop positive incentive measures, where necessary, to assist the conservation of biodiversity;
- Establish and implement mechanisms for the payments of ecosystem services including carbon stocks, to generate increased revenue for biodiversity conservation and restoration;
- Develop and implement a National Biodiversity Finance Plan to set out in detail how the actions and targets of this NBAP will be delivered from 2017 and beyond; and
- Monitor the implementation of the Plan”

Such policies have informed the evaluation of ecological features recorded within the study area and the ecological assessment process.

### European Legislation

The EU Habitats and Birds Directive forms the cornerstone of Europe's nature conservation within the EU. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. The Habitats Directive protects over 1,000 animal and plant species and over 200 "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance. The Habitats Directive and Birds Directive, which were transposed into Irish law through Part XAB of the Planning and Development Acts 2000 (as amended) (from a land use planning perspective) recognise the significance of protecting rare and endangered species of flora and fauna, and more importantly, their habitats.

Annex I of the Habitats Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. marsh



fritillary, Atlantic salmon, and Killarney fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as lesser horseshoe bat and otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish hare, common frog and pine marten. Species can be listed in more than one Annex, as is the case with otter and lesser horseshoe bat which are listed on both Annex II and Annex IV. The disturbance of species under Article 12 of the Habitats Directive (and in particular avoidance of deliberate disturbance of Annex IV species, particularly during the period of breeding, rearing, hibernation and migration and avoidance of deterioration or destruction of breeding sites or resting places) has been specifically assessed in this EIAR.

Council Directive 2009/147/EC on the conservation of wild birds (the “Birds Directive”) instructs Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). According to Recital 1 of the Birds Directive, Council Directive 79/409/EEC on the conservation of wild birds was substantially amended several times and in the interests of clarity and rationality, the Birds Directive codifies Council Directive 79/409/EEC. Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3). A subset of bird species has been identified in the Directive and are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

In summary, the species and habitats provided National and International protection under these legislative and policy documents have been considered in this impact assessment. A detailed assessment of the likelihood of the Proposed Development having either a significant effect or an adverse impact on any relevant European Sites (i.e. SACs, cSACs, SPAs or cSPAs) has been carried out in the Natura Impact Statement (NIS) which accompanies the planning application for the Proposed Development. A separate assessment has not been carried out in this chapter, to avoid duplication of assessments. However, the relevant conclusions from the NIS have been cross-referenced and incorporated.

### 6.3

## Scoping/Review of Relevant Guidance and Sources of Consultation

The assessment methodology is based primarily upon the National Road Authority (NRA)’s Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2 (NRA, 2009) (referred to hereafter as the NRA Ecological Impact Assessment Guidelines), and the survey methodology is based on the NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009). Although these survey methodologies relate to road schemes, these standard guidelines are recognised survey methodologies that ensure good practice regardless of the development type.

In addition, the following guidelines were consulted in the preparation of this document to provide the scope, structure and content of the assessment:

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal (CIEEM, 2018).
- EPA Guidelines on information to be included in Environmental Impact Assessment Reports (EPA, 2022)

### 6.3.1 Statement of Authority

Ecological baseline surveys, including bat surveys, were conducted by MKO ecologists; Claire Stephens (BSc.) and Katie Grice (BSc). All surveyors have relevant academic qualifications and experience in undertaking habitat and ecological assessments. Bat survey data was compiled and assessed by Kate Greaney (BSc., MSc.) and Stephanie Corkery (BSc., MSc.).

This EIAR Chapter has been prepared by Stephanie Corkery and Pádraig Desmond (BSc.). Pádraig is a Project Ecologist with over 2.5 years' experience in ecological consultancy. This report has been reviewed by Aoife Joyce and Corey Cannon. Corey is a Senior Ecologist with MKO, she holds a BSc in Zoology and an MSc in Biodiversity Survey. Corey is a Chartered Ecologist (CEcol) and Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM).

## 6.4 Methodology

The following sections describe the methodologies followed to establish the baseline ecological condition of the EIAR Site Boundary and surrounding area. Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

### 6.4.1 Desk Study

The desk study undertaken for this assessment included a thorough review of available ecological data including the following:

- Review of online web-mappers: National Parks and Wildlife Service (NPWS), EPA (Envision), Water Framework Directive (WFD) and Inland Fisheries Ireland (IFI).
- Data on potential occurrence of protected bryophytes – as per NPWS online map viewer; Flora Protection Order Map Viewer – Bryophytes.
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper
- Records from the NPWS web-mapper and review of specially requested records from the NPWS Rare and Protected Species Database for the hectads in which the Proposed development is located.

### 6.4.2 Scoping and Consultation

MKO undertook a scoping exercise during preparation of this EIAR, as described in Chapter 2, Section 2.4 of this EIAR.

Copies of all scoping responses are included in **Appendix 2.1** of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this chapter. Table 2.7 in Chapter 2 of this EIAR describes where the comments raised in the scoping responses received have been addressed in this assessment.

### 6.4.3 Field Surveys

A comprehensive survey of the biodiversity of the entire site was undertaken in the optimal survey season in 2022. The following sections fully describe the ecological surveys that have been undertaken and provide details of the methodologies, dates of survey and guidance followed.

### 6.4.3.1 Multi-disciplinary Walkover Surveys

Prior to the commencement of multidisciplinary walkover surveys of the proposed site, the habitats within the site were initially assessed from aerial photography.

#### 6.4.3.1.1 Habitat classification

Ecological baseline surveys, including bat surveys, were conducted on the 26<sup>th</sup> of July and 9<sup>th</sup> of August 2022. The site was systematically and thoroughly walked in a ground-truthing exercise with the habitats on site assessed, classified and mapped using aerial imagery.

The multi-disciplinary ecological walkover surveys were undertaken in accordance with NRA (2009) Guidelines. This survey provided baseline data on the ecology of the study area and assessed whether further, more detailed habitat or species-specific ecological surveys were required. The multi-disciplinary ecological walkover survey comprehensively covered the entire study area.

Habitats were classified in accordance with the Heritage Council's 'Guide to Habitats in Ireland' (Fossitt, 2000). Habitat mapping was undertaken with regard to guidance set out in 'Best Practice Guidance for Habitat Survey and Mapping' (Smith *et al.*, 2011).

Habitats considered to be of ecological significance and with the potential to be impacted as part of the Proposed Development were identified and classified as Key Ecological Receptors (KERs).

Plant nomenclature for vascular plants follows '*New Flora of the British Isles*' (Stace, 2010).

The walkover surveys were designed to detect the presence, or suitable habitat for a range of protected faunal species that may occur in the vicinity of the EIAR Site Boundary.

The survey timing falls within the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith *et al.*, 2011).

Other targeted survey methodologies undertaken at the site are described in the following subsections.

#### 6.4.3.1.2 Terrestrial Fauna Surveys

The results of the desk study, scoping replies, incidental records of protected species during ecological survey work and multidisciplinary walkover surveys were used to inform the scope of targeted ecological surveys required. Dedicated surveys for bats and badger were undertaken at the times set out below with the methodologies followed also provided below. During the multidisciplinary walkover surveys, records of invertebrates including butterflies, damselflies, dragonflies, moths, beetles etc. were recorded.

##### Badger Survey

As part of the multidisciplinary survey, a search for indications of badger was carried out. This search was conducted in order to determine the presence or absence of badger within EIAR Site Boundary. This involved a search for all potential signs of badger activity within the site (latrines, badger paths and setts). Following the results of the multi-disciplinary surveys, no requirement for further, more detailed surveys for badger was identified.

The badger surveys covered the entire EIAR Site Boundary. The badger survey was not constrained by vegetation given the nature of the habitats within the site and the timing of the surveys (NRA 2009).



## Marsh Fritillary Surveys

Following the desk study and as per the National Biodiversity Data Centre (NBDC) map viewer, marsh fritillary are known to occur within the hectad (M55), in which the EIAR Site Boundary is located. Therefore, as part of the multidisciplinary survey, a search for potential suitable habitat for marsh fritillary was carried out. This included a search for devil's-bit scabious (*Succisa pratensis*) which is the food plant for the larval stage of this species. Devil's-bit scabious species was found to be present within a small area of the site (see Section 6.6.1) and as such a search for larval webs was conducted in this area on the 9<sup>th</sup> August 2022.

### 6.4.3.1.3 Bat Surveys

#### Bat Habitat Suitability Appraisal

Habitats within the EIAR Site Boundary were surveyed on the 9<sup>th</sup> of August 2022 and evaluated for their suitability to support roosting, foraging and commuting bats. Connectivity with the wider landscape was also considered. Suitability was evaluated following Collins (2016) which provides suitability categories for habitats. The categories are described fully in Collins (2016) and are broken down into *High*, *Moderate*, *Low* and *Negligible*, suitability.

#### Roost Surveys

A search for roosts was undertaken within the EIAR Site Boundary. The aim was to determine the presence of roosting bats and the potential need for further survey work or mitigation. The site was visited on the 9<sup>th</sup> of August 2022.

No buildings were present on site. Any potential tree roosts were examined for the presence of rot holes, hazard beams, cracks and splits, partially detached bark, knot holes, gaps between overlapping branches and any other potential roost features (i.e. PRFs) identified by Andrews (2018).

#### Manual Activity Surveys

A manual bat activity survey was undertaken in the form of a walked transect on the 9<sup>th</sup> of August 2022. Surveyors were equipped with an active full spectrum bat detector, the Batlogger M bat detector (Elekon AG, Lucerne, Switzerland) and all bat activity was recorded for subsequent analysis to confirm species identifications. Individual bats of the same species cannot be identified using this method: the number of bat passes recorded is used as a measure of activity within the area, although it might not reflect the number of individual bats present, as the same bat can be recorded multiple times.

A dusk survey was carried out during weather conditions suitable for bat surveying (Collins, 2016). Details of the survey are presented in Table 6-1 and described below.

Table 6-1 Manual Activity Surveys

Date	Surveyors	Survey Type	Sunset/ Sunrise	Start-End	Weather
9 <sup>th</sup> August 2022	Claire Stephens & Katie Grice	Dusk Transect	21:15	20:52 – 23:20	13 - 22 °C; dry; calm

The transect route commenced 30 minutes before sunset and concluded approximately 2 hours after sunset. The aim of the survey was to identify the bat species using the site and gather any information on bat behaviour and important features used by bats inside and outside the EIAR Site Boundary. The transect route was prepared with reference to the proposed layout, desktop, and walkover survey results as well as any health and safety considerations and access limitations. As such, the transect route followed existing tracks and paths and trails along the treelines. The transect route is presented in Figure 6-5.

## Static Detector Surveys

Two full spectrum bat detectors, Song Meter SM4BAT (Wildlife Acoustics, Maynard, MA, USA) were deployed for a total of 14 nights; from the 26<sup>th</sup> of July 2022 to the 9<sup>th</sup> of August inclusive. The location of the static detector was selected to represent likely habitats used by foraging and commuting bat species in proximity of the site (ITM Grid Ref: X 552062 Y 756543 and X 552341 Y 756448).

Settings used were those recommended by the manufacturer for bats, with minor adjustments in gain settings and band pass filters to reduce background noise when recording. The detector was set to record from 30 minutes before sunset until 30 minutes after sunrise. The Song Meter automatically adjusts sunset and sunrise times using the Solar Calculation Method when provided with GPS coordinates. The location of the static detector is shown in Figure 6-5.

All recordings were later analysed using bat call analysis software Kaleidoscope Pro v.5.4.9 (Wildlife Acoustics, MA, USA). The aim of this was to identify, to a species or genus level, what bats were present at the site. Bat species were identified using established call parameters, to create site-specific custom classifiers. All identified calls were also manually verified.

### 6.4.3.2 Invasive species survey

During the survey of the site a search for non-native invasive species was undertaken. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 -2021.

### 6.4.3.3 Survey Limitations

The field survey was carried out during suitable weather conditions and the site was fully accessible. There were no barriers to access, and the weather conditions were suitable for this type of survey. In relation to bat surveys, July is within the optimal bat survey season.

Seasonal factors that affect distribution patterns and habits of species were taken into account when conducting the surveys. The potential of the site to support certain populations (in particular those of conservation importance that may not have been recorded during the field survey due to their seasonal absence or nocturnal/cryptic habits) was assessed.

## 6.4.4 Methodology for Assessment of Impacts and Effects

### 6.4.4.1 Identification of Target Receptors and Key Ecological Receptors

The methodology for assessment followed a precautionary screening approach with regard to the identification of Key Ecological Receptors (KERs). Following a comprehensive desk study, site visits and stakeholder consultation; “Target receptors” likely to occur in the zone of influence of the development were identified. The target receptors included habitats and species that were protected under the following legislation:

- Annexes of the EU Habitats Directive
- Qualifying Interests (QI) of Special Areas of Conservation (SAC) within the likely Zone of Influence.
- Special Conservation Interests (SCI) of Special Protected Areas (SPA) within the likely Zone of Influence.
- Species protected under the Wildlife Acts 1976-2022
- Species protected under the Flora Protection Order 2022

#### 6.4.4.2 Determining Importance of Ecological Receptors

The importance of the ecological features identified within the study area was determined with reference to a defined geographical context. This was undertaken following a methodology that is set out in Chapter 3 of the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009). These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

- International
- National
- County
- Local Importance (Higher Value)
- Local Importance (Lower Value)

The Guidelines clearly set out the criteria by which each geographic level of importance can be assigned. Locally Important (lower value) receptors contain habitats and species that are widespread and of low ecological significance and of any importance only in the local area. Internationally Important sites are either designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna. Specific criteria for assigning each of the other levels of importance are set out in the guidelines and have been followed in this assessment. Where appropriate, the geographic frame of reference set out above was adapted to suit local circumstances. In addition, and where appropriate, the conservation status of habitats and species is considered when determining the significance of ecological receptors.

Any ecological receptors that are determined to be of National or International, County or Local importance (Higher Value) following the criteria set out in NRA (2009) are considered to be Key Ecological Receptors (KERs) for the purposes of ecological impact assessment if there is a pathway for effects thereon. Any receptors that are determined to be of Local Importance (Lower Value) are not considered to be Key Ecological Receptors and are therefore not assessed within the impact assessment.

#### 6.4.4.3 Characterisation of Impacts and Effects

The Proposed Development will result in a number of impacts. The ecological effects of these impacts are characterised as per the CIEEM 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018). These guidelines are the industry standard for the completion of Ecological Impact Assessment in the UK and Ireland. This chapter has also been prepared in accordance with the corresponding EPA guidance (EPA 2022). The headings under which the impacts are characterised follow those listed in the guidance document and are applied where relevant. A summary of the impact characteristics considered in the assessment is provided below:

- **Positive or Negative.** Assessment of whether the Proposed Development results in a positive or negative effect on the ecological receptor.
- **Extent.** Description of the spatial area over which the effect has the potential to occur.
- **Magnitude** Refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
- **Duration** is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. For example, five years, which might seem short-term in the human context or that of other long-lived species, would span at least five generations of some invertebrate species.
- **Frequency and Timing.** This relates to the number of times that an impact occurs and its frequency. A small-scale impact can have a significant effect if it is repeated on numerous occasions over a long period.



- **Reversibility.** This is a consideration of whether an effect is reversible within a 'reasonable' timescale. What is considered to be a reasonable timescale can vary between receptors and is justified where appropriate in the impact assessment section of this report.

#### 6.4.4.4 Determining the Significance of Effects

The ecological significance of the effects of the Proposed Development are determined following the precautionary principle and in accordance with the methodology set out in Section 5 of CIEEM (2018).

For the purpose of Ecological Impact Assessment (EcIA), 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local (CIEEM, 2018).

When determining significance, consideration is given to whether:

- Any processes or key characteristics of key ecological receptors will be removed or changed.
- There will be an effect on the nature, extent, structure, and function of important ecological features.
- There is an effect on the average population size and viability of ecologically important species.
- There is an effect on the conservation status of important ecological habitats and species.

The EPA Guidelines on information to be included in Environmental Impact Assessment Reports (EPA, 2022) and the *Guidelines for assessment of Ecological Impacts of National Road Schemes*, (NRA, 2009) were also considered when determining significance and the assessment is in accordance with those guidelines.

The terminology used in the determination of significance follows the suggested language set out in the EPA Guidelines (2022) as shown in Table 6-2.

Table 6-2 Criteria for Descriptions of Effects, based on EPA (2022) guidelines.

Significance of Effects	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.

As per NRA (NRA, 2009) and CIEEM (CIEEM, 2018) best practice guidelines, the following key elements should also be examined when determining the significance of effects:

- The likely effects on 'integrity' should be used as a measure to determine whether an impact on a site is likely to be significant (NRA, 2009).
- A 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives (CIEEM, 2018).

## Integrity

In the context of EIAR, 'integrity' refers to the coherence of the ecological structure and function, across the entirety of a site, that enables it to sustain all of the ecological resources for which it has been valued (NRA, 2009). Impacts resulting in adverse changes to the nature, extent, structure and function of component habitats and effects on the average population size and viability of component species, would affect the integrity of a site, if it changes the condition of the ecosystem to unfavourable.

## Conservation status

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status. According to CIEEM (2018) guidelines the definition for conservation status in relation to habitats and species are as follows:

- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area.
- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

As defined in the EU Habitats Directive 92/43/EEC, the conservation of a habitat is favourable when:

- Its natural range, and areas it covers within that range, are stable or increasing.
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.
- The conservation status of its typical species is favourable.

The conservation of a species is favourable when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats.
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future.
- There is and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis.

According to the NRA/CIEEM methodology, if it is determined that the integrity and/or conservation status of an ecological feature will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county, national, international).

### 6.4.4.5 Incorporation of Mitigation

Section 6.7 of this Biodiversity chapter assesses the potential effects of the Proposed Development to ensure that all effects on KERs are adequately addressed. Where significant effects on KERs are predicted, mitigation is incorporated into the project design or layout to address such impacts. The implemented mitigation measures aim to avoid, reduce or offset potential significant residual effects, post mitigation.

## 6.5 Establishing the Ecological Baseline

### 6.5.1 Desk Study

The following sections describe the results of a survey of published material that was consulted as part of the desk study for the purposes of the ecological assessment. It provides a baseline of the ecology known to occur in the existing environment. Material reviewed includes the Site Synopses for designated sites within the zone of

influence, as compiled by the National Parks and Wildlife Service (NPWS) of the Department of Culture, Heritage and the Gaeltacht, bird and plant distribution atlases and other research publications.

### 6.5.1.1 Designated Sites

#### 6.5.1.1.1 Identification of the Designated Sites within the Likely Zone of Influence of the Proposed Development

The potential for the Proposed Development to impact on sites that are designated for nature conservation was considered in this Ecological Impact Assessment.

Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under the EU Habitats Directive and EU Birds Directive, respectively and are collectively known as 'European Sites'. The potential for significant effects and/or adverse impacts on the integrity of European Sites is fully assessed in the AA Screening Report and Natura Impact Statement that accompanies this application. As per EPA Guidance 2022, *"a biodiversity section of an EIAR, for example, should not repeat the detailed assessment of potential effects on European sites contained in documentation prepared as part of the Appropriate Assessment process"* but should *"refer to the findings of that separate assessment in the context of likely significant effects on the environment, as required by the EIA Directive"*. Section 6.7.5 of this Biodiversity Chapter provides a summary of the key assessment findings with regard to European Designated Sites.

Natural Heritage Areas (NHAs) are designated under Section 18 the Wildlife (Amendment) Act 2000 and their management and protection is provided for by this legislation and planning policy. The potential for effects on these National Sites is fully considered in this EIAR.

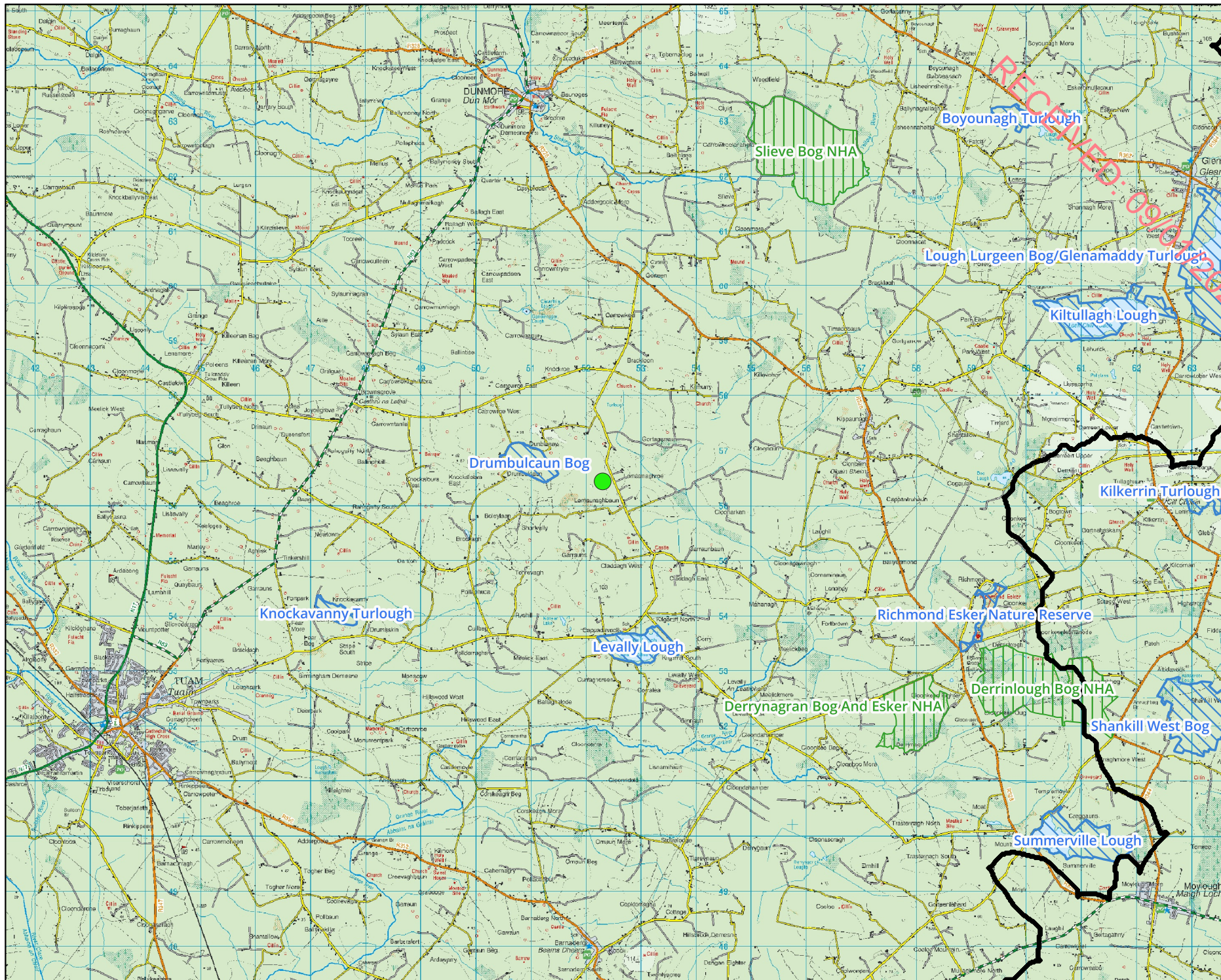
Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these designated sites is fully considered in this EcIA.

The following methodology was used to establish sites that are designated for nature conservation have the potential to be impacted by the Proposed Development:

- Initially the most up to date GIS spatial datasets for European and Nationally designated sites and water catchments were downloaded from the NPWS website ([www.npws.ie](http://www.npws.ie)) and the EPA website ([www.epa.ie](http://www.epa.ie)) on the 08/11/2023. The datasets were utilised to identify Designated Sites which could feasibly be affected by the Proposed Development.
- All European and National Sites that could potentially be affected were identified using a source-pathway - receptor model. To provide context for the assessment, National and European Sites surrounding the EIAR Site Boundary are shown on Figures 6-2 and 6-3 respectively. Sites that were further away from the Proposed Development were also considered and, in this case, no potential source-pathway-receptor chain for effect on any additional Designated Site Proposed Development was identified.
- A map of all the National Sites within the likely zone of influence is provided in Figure 6-2 with all European sites shown in Figure 6-3.
- Table 6-3 provides details of all relevant National Sites as identified in the preceding steps and assesses which are within the likely Zone of Influence. All European Designated Sites are fully described and assessed in the Screening for Appropriate Assessment and Natura Impact Statement reports submitted as part of this planning application.
- The designation features of these sites, as per the NPWS website ([www.npws.ie](http://www.npws.ie)), were consulted and reviewed at the time of preparing this report.

Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Influence and further assessment is required.





## Map Legend

- Site location
- ▨ Natural Heritage Area (NHA)
- ▨ Proposed Natural Heritage Area (pNHA)
- ▭ WFD Catchments



Drawing Title  
Nationally Designated Sites in the likely zone of influence

Project Title  
Lomaunaghbaun Quarry,  
Lomaunaghbaun, Tuam, Co. Galway

Drawn By	Checked By
DM	SC

Project No.	Drawing No.
211034	6-2

Scale	Date
1:90,000	30/11/2023

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Table 6-3 Identification of Nationally designated sites within the Likely Zone of Influence

Designated Site	Features of Interest	Likely Zone of Influence Determination
Natural Heritage Areas		
Slieve Bog NHA [000247]	➤ Peatlands	<p>This NHA is located 6.1km southeast of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>No indirect pathways for effect exist between the EIAR Site Boundary and Slieve Bog NHA due to its terrestrial nature and the intervening distance between the Proposed Development Site and the NHA.</p> <p>Therefore, this NHA is <b>not</b> considered to be within the Zone of Influence of the Proposed Development.</p>
Derrynagran Bog and Esker NHA [001255]	➤ Peatlands	<p>This NHA is located 6.2km southeast of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>No indirect pathways for effect exist between the EIAR Site Boundary and Derrynagran Bog and Esker NHA due to its terrestrial nature and the intervening distance between the Proposed Development Site and the NHA.</p> <p>Therefore, this NHA is <b>not</b> considered to be within the Zone of Influence of the Proposed Development.</p>
Derrinlough Bog NHA [001254]	➤ Peatlands	<p>This NHA is located 7.3km southeast of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>No indirect pathways for effect exist between the EIAR Site Boundary and Derrinlough Bog NHA due to its terrestrial nature and the intervening distance between the Proposed Development Site and the NHA.</p> <p>Therefore, this NHA is <b>not</b> considered to be within the Zone of Influence of the Proposed Development.</p>
Killaclogher Bog NHA [001280]	➤ Peatlands	<p>This NHA is located 13.8km south of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>No indirect pathways for effect exist between the EIAR Site Boundary and Killaclogher Bog NHA due to its terrestrial nature and the intervening distance between the Proposed Development Site and the NHA.</p> <p>Therefore, this NHA is <b>not</b> considered to be within the Zone of Influence of the Proposed Development.</p>
Proposed Natural Heritage Area (pNHA)		
Drumbulcaun Bog pNHA [000263]	➤ Peatlands ➤ Fen	<p>This pNHA is located 0.6km west of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p>



	<p>&gt; Flooded grasslands</p>	<p>However, it is located in the same groundwater catchment as the EIAR Site Boundary, the Clare-Corrib. Taking a precautionary approach, the potential for the Proposed Development to result in significant impacts on groundwater fed features of interest within this pNHA is considered further in the assessment.</p> <p><b>Therefore, this pNHA is within the Likely Zone of Influence of the Proposed Development.</b></p>
<p>Levally Lough pNHA [000295]</p>	<p>&gt; No NPWS site synopsis available</p>	<p>This pNHA is located 2.7km south of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>However, it is located in the same groundwater catchment as the EIAR Site Boundary, the Clare-Corrib. As this pNHA corresponds to Levally Lough SAC [000295], which is designated for turloughs, and taking a precautionary approach, there is potential for the Proposed Development to result in significant impacts on groundwater fed features of interest within this pNHA.</p> <p><b>Therefore, this pNHA is within the Likely Zone Influence of the Proposed Development.</b></p>
<p>Knockavanny Turlough pNHA [000289]</p>	<p>&gt; Turloughs &gt; Wigeon</p>	<p>This pNHA is located 4.9km southwest of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>However, it is located in the same groundwater catchment as the EIAR Site Boundary, the Clare-Corrib. Taking a precautionary approach, there is potential for the Proposed Development to result in significant impacts on groundwater fed features of interest within this pNHA.</p> <p><b>Therefore, this pNHA is within the Likely Zone of Influence of the Proposed Development.</b></p>
<p>Richmond Esker Nature Reserve pNHA [000323]</p>	<p>&gt; Wooded esker</p>	<p>This pNHA is located 6.9km southeast of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>No indirect pathways for effect exist between the EIAR Site Boundary and this pNHA due to its terrestrial nature and the intervening distance between the Proposed Development Site and the NHA.</p> <p>Therefore, this pNHA is <b>not</b> within the likely Zone of Influence.</p>
<p>Kiltullagh Lough pNHA [001282]</p>	<p>&gt; Lakes &gt; Waterfowl &gt; Turloughs</p>	<p>This pNHA is located 8.3km northeast of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>However, it is located in the same groundwater catchment as the EIAR Site Boundary, the Clare-Corrib. Taking an extremely approach, there is potential for the Proposed Development to result in significant impacts on groundwater fed features of interest within this pNHA.</p> <p><b>Therefore, this pNHA is within the Likely Zone of Influence.</b></p>

Boyounagh Turlough pNHA [001237]	<ul style="list-style-type: none"> <li>Turloughs</li> </ul>	<p>This pNHA is located 9.4km north of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>However, it is located in the same groundwater catchment as the EIAR Site Boundary, the Clare-Corrib. Taking an extremely approach, there is potential for the Proposed Development to result in significant impacts on groundwater fed features of interest within this pNHA.</p> <p><b>Therefore, this pNHA is within the Likely Zone of Influence.</b></p>
Summerville Lough pNHA [001319]	<ul style="list-style-type: none"> <li>Lakes</li> <li>Peatlands</li> <li>Species rich grassland</li> </ul>	<p>This pNHA is located 9.9km from the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>No indirect pathways for effect exist between the EIAR Site Boundary and this pNHA due to the absence of surface water connectivity and the intervening distance between the Proposed Development Site and the NHA.</p> <p>Therefore, this NHA is <b>not</b> within the likely Zone of Influence.</p>
Kilkerrin Turlough pNHA [001279]	<ul style="list-style-type: none"> <li>Turloughs</li> </ul>	<p>This pNHA is located 10.4km from the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>However, it is located in the same groundwater catchment as the EIAR Site Boundary, the Clare-Corrib. Taking an extremely approach, there is potential for the Proposed Development to result in significant impacts on groundwater fed features of interest within this pNHA.</p> <p><b>Therefore, this pNHA is within the Likely Zone of Influence.</b></p>
Shankill West Bog pNHA [000326]	<ul style="list-style-type: none"> <li>No NPWS site synopsis available</li> </ul>	<p>This pNHA is located 10.6km southeast from the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>No indirect pathways for effect exist between the EIAR Site Boundary and this pNHA due to the absence of surface water connectivity and the intervening distance between the Proposed Development Site and the NHA.</p> <p>Therefore, this NHA is <b>not</b> within the likely Zone of Influence.</p>
Lough Lurgeen Bog/Glenamaddy Turlough pNHA [000301]	<ul style="list-style-type: none"> <li>No NPWS site synopsis available</li> </ul>	<p>This pNHA is located 10.9km northeast of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>No surface water connectivity exists between the EIAR Site Boundary and this pNHA and they are located within separate groundwater catchments.</p> <p>Therefore, this NHA is <b>not</b> within the likely Zone of Influence.</p>

Lisnageeragh Bog and Ballinastack Turlough pNHA [000296]	> No NPWS site synopsis available	<p>This pNHA is located 13.9km northeast of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>No surface water connectivity exists between the EIAR Site Boundary and this pNHA and they are located within separate surface and ground water catchments.</p> <p>Therefore, this NHA is <b>not</b> within the likely Zone of Influence.</p>
Carrownagappul Bog pNHA [001242]	> No NPWS site synopsis available	<p>This pNHA is located 14.4 km southeast of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>No surface water connectivity exists between the EIAR Site Boundary and this pNHA and they are located within separate surface and ground water catchments.</p> <p>Therefore, this NHA is <b>not</b> within the likely Zone of Influence.</p>
Curraghleanagh Bog pNHA [000256]	> No NPWS site synopsis available	<p>This pNHA is located 14.5 km southeast of the EIAR Site Boundary and therefore, there is no potential for direct impacts.</p> <p>No surface water connectivity exists between the EIAR Site Boundary and this pNHA and they are located within separate surface and ground water catchments.</p> <p>Therefore, this NHA is <b>not</b> within the likely Zone of Influence.</p>

No NHA was identified to be within the Likely Zone of Influence, as detailed above. Several pNHA, on a precautionary basis, have been determined to be within the likely Zone of Influence, as they are important sites for groundwater dependent habitats, and they are located within the same groundwater catchment as the EIAR Site Boundary. The EIAR Site Boundary is also located in an area of high vulnerability to groundwater contamination.

The following pNHAs have been identified to be within the likely Zone of Influence;

- Drumbulcaun Bog pNHA [000263]
- Levally Lough pNHA [000295]
- Knockavanny Turlough pNHA [000289]
- Kiltullagh Lough pNHA [001282]
- Boyounagh Turlough pNHA [001237]
- Kilkerrin Turlough pNHA [001279]

The AA Screening that accompanies this application identified the potential for likely significant effects (LSEs) on European sites from the proposed development. These sites include:

- Levally Lough SAC (000295)
- Lough Corrib SAC (000297)
- Williamstown Turloughs SAC (002296)
- Lough Corrib SPA (004042)

The potential for adverse effects on these sites has been assessed within the NIS which accompanies this application. The potential for impacts on these sites is summarised in Section 6.7.5 of this chapter.

### 6.5.1.2 NPWS Article 17 Reporting

A review of the Irish Reports for Article 17 of the Habitats Directive (92/42/EEC), including the Heath, Bogs and Mires, Irish Semi-Natural Grassland Survey datasets, National Survey of Native Woodlands and Ancient and Long-Established Woodland datasets were conducted prior to undertaking the multi-disciplinary walkover survey.

Available NPWS datasets were downloaded and overlain on the Proposed Development study area. None of the NPWS GIS datasets contain polygon or point data within the EIAR Study Area.

### 6.5.1.3 Vascular plants

A search was made in the New Atlas of the British & Irish Flora (Preston et al., 2002) to investigate whether any rare or unusual plant species listed as Annex II of the Habitats Directive, Ireland Red List no 10 Vascular Plants (Wyse Jackson et al., 2016) or protected under the Flora (Protection) Order, 2022 had been recorded in the relevant 10km squares in which the study site is situated (M55) during the 1987-1999 atlas survey. Each hectad contains 100 whole one kilometre squares containing terrestrial habitats. Species of conservation concern are given in Table 6-4. No species listed in Annex II of the Habitats Directive or the Flora (Protection) Order are shown in the atlas for square M55.

Table 6-4 Species listed designated under the Flora Protection Order or the Irish Red Data Book within Hectad M55

Common Name	Scientific Name	Status
Corn Marigold	<i>Chrysanthemum segetum</i>	NT
Greater knapweed	<i>Centaurea scabiosa</i>	NT
Autumn gentian	<i>Gentianella amarella</i>	NT
Least bur-reed	<i>Sparganium natans</i>	NT
Marsh fern	<i>Thelypteris palustris</i>	NT

Near Threatened (NT), Vulnerable (VU), Critically Endangered (CR), Regionally Extinct (RE)

#### 6.5.1.4 Bryophytes

A search of the NPWS online data map for bryophytes (NPWS, 2018) was also undertaken with no protected bryophytes recorded within or adjacent to the EIAR Site Boundary.

#### 6.5.1.5 National Biodiversity Data Centre (NBDC) Records

A search of the National Biodiversity Data Centre (NBDC) website was conducted on the 1<sup>st</sup> of November 2023. This helped to inform survey effort and provide a baseline of likely species composition in the area. Records of protected fauna recorded from hectad M55 are provided in Table 6-5.

Table 6-5 NBDC records for species of conservation interest in hectad M55.

Common name	Scientific name	Designation
Common Frog	<i>Rana temporaria</i>	HD Annex V, WA
Freshwater White-Clawed Crayfish	<i>Austropotamobius pallipes</i>	HD Annex II, IV
Marsh Fritillary	<i>Euphydryas aurinia</i>	HD Annex II, WA
European Otter	<i>Lutra lutra</i>	HD Annex II, IV, WA
Pine Martin	<i>Martes martes</i>	HD Annex V, WA
Eurasian Badger	<i>Meles meles</i>	WA
Eurasian Pygmy Shrew	<i>Sorex minutus</i>	WA
West European Hedgehog	<i>Erinaceus europaeus</i>	WA

HD = EU Habitats Directive; WA = Wildlife Acts (Ireland).

#### 6.5.1.6 National Bat Database of Ireland

The National Bat Database of Ireland holds records of bat observations received and maintained by Bat Conservation Ireland. These records include results of national monitoring schemes, roost records as well as ad-hoc observations. A search was undertaken, on the 1<sup>st</sup> of November 2023, for bat presence within a 10km radius of the EIAR Site Boundary (Grid Ref: X 552367 Y 756474 ITM). The EIAR Site Boundary is outside the known range of lesser horseshoe bat.

Following the search, no bat records were obtained for hectad M55.

#### 6.5.1.7 NPWS Protected Species Records

National Parks and Wildlife Service (NPWS) online records were searched to see if any rare or protected species of flora or fauna have been recorded from hectad M55. An information request was also sent to the NPWS scientific data unit requesting records from the Rare and Protected Species Database. Table 6-6 lists rare and protected species records obtained from NPWS.

Table 6-6 NPWS records for rare and protected species.

Common name	Scientific name	Designation
Common frog	<i>Rana temporaria</i>	HD Annex V, WA
Irish Hare	<i>Lepus timidus subsp. Hibernicus</i>	Annex V, WA
Freshwater White-Clawed Crayfish	<i>Austropotamobius pallipes</i>	HD Annex II, IV
Pine Martin	<i>Martes martes</i>	HD Annex V, WA
Badger	<i>Meles meles</i>	WA
European otter	<i>Lutra lutra</i>	HD Annex II, IV, WA

FPO = Flora Protection Order; RL = Red List, VU = Vulnerable, WA = Wildlife Act

#### 6.5.1.8 Invasive Species

The NBDC database also contains records of invasive species identified within the relevant hectad. Records of 'high impact' invasive species for hectad M55 are provided in Table 6-7.



Table 6-7 NBDC records for invasive species (hectad M55)

Common Name	Scientific Name	Hectad
Fallow Deer	<i>Dama dama</i>	M55

### 6.5.1.9 Baseline Hydrology

The baseline hydrology of the site and surrounding area has been reviewed on the EPA web-mapper (<https://gis.epa.ie/EPAMaps/>) was consulted on the 03/11/2023.

Regionally, the EIAR Site Boundary is located in the Corrib surface water catchment (IEWE) within Hydrometric Area 30 of the Corrib River Basin District. A regional hydrology map is shown in Figure 8-1, Chapter 9 of this EIAR. On a more local scale, the EIAR Site Boundary is located within the Corrib (catchment ID\_30) surface water catchment. This is located within the Western River Basin District.

Within these catchments, the study area is located within the Clare-Galway sub-catchment (Clare[Galway]\_SC\_040) (Subcatchment ID\_30\_19). The study area is located within the Levally stream (LEVALLY STREAM\_010) sub-basin. With regards to local hydrology, there are no mapped watercourses either within or adjacent to the site. The nearest mapped watercourse within the Levally Stream\_010 sub-basin is the Dunblaney stream (EPA Code: 30D34 – Order 1), located 596m to the east of the proposed development. Levally Lough is located approximately 2.71km to the south. The Dunblaney stream is separated from the Proposed Development by local roads, residential dwellings, and agricultural lands. There is no mapped surface water connectivity occurring between the site of the Proposed Development and the watercourse.

The Biotic Index of Water Quality (BIWQ) was developed in Ireland by the Environmental Protection Agency (EPA). Q-values are assigned using a combination of habitat characteristics and structure of the macro-invertebrate community within the waterbody. Individual macro-invertebrate families are classified according to their sensitivity to organic pollution and the Q-value is assessed based primarily on their relative abundance within a sample.

The site of the Proposed Development is located within the Clare-Corrib groundwater catchment. This groundwater body has been identified as 'At Risk' (as per the Water Framework Directive risk score), with the overall water status assessed as 'Good'.

#### 6.5.1.9.1 Water Quality

River Basin Management Plans (RBMPs) have been published for all River Basin Districts in Ireland in accordance with the requirements of the Water Framework Directive. The online EPA Envision map viewer provides access to water quality information at individual waterbody status for all the River Basin Districts in Ireland. The EPA Envision map viewer was consulted on the 5<sup>th</sup> of October 2023 regarding the water quality status of the Dunblaney stream, which flows into the Levally Stream\_10, located 596m east of the Study Area. This is the closest waterbody to the site of the Proposed Development. The WFD River Waterbody Status 2016 – 2021 for the watercourses closest to the site have been assessed in Table 6-8.

Table 6-8 Watercourses on site with relevant water quality statuses

Name	Location	Status	Risk
Levally Stream_10	Located to the east of the proposed site, flowing south-east	Good	Not at risk

Status– WFD River Waterbody Status 2016-2021 Risk – WFD River Waterbodies Risk

Table 6-9 provides the respective Q-value status results from monitoring stations located along rivers which flow through the site or along rivers which are fed directly by watercourses which flow through or around the site.

Table 6-9 Water quality monitoring stations and associated Q values

Watercourse Name	Sampling Station	Location	Sampling Year	Q-Value & Water Quality Status
Levally Stream (EPA Code: 30L07)	Bridge N. of Mahanagh	E155976 N 254185	1989	3 (Poor)

#### 6.5.1.10 Conclusions of the Desktop Study

The desktop study has provided information about the existing environment in hectad M55, within which the EIAR Site Boundary is located. The Proposed Development is located in the Corrib surface water catchment (IEWE) within Hydrometric Area 30 of the Corrib River Basin District. On a more local scale, the site is located in the Clare-Galway sub-catchment.

There are no watercourses which drain the Proposed Development site, with the closest watercourses being located over 0.5 km from the EIAR Site Boundary. The Proposed Development site is located in a groundwater catchment where there is high surface to ground water interaction, and the site is underlain by highly porous sands and gravels. Taking an extremely approach, several European and National Sites have been identified to be within the likely Zone of Influence.

The desk study identified that a variety of protected faunal species are known to occur within hectad M55, , including marsh fritillary, otter, lamprey spp., Atlantic salmon, and badger. The species recorded during the desk study informed the survey methodologies undertaken during the site visits.

The desk study provided useful information to inform the ecological surveys undertaken on site as well as the identification of pathways for potential impacts on sensitive ecological receptors.