

Chapter 6:

BIODIVERSITY

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6 BIODIVERSITY

6.1 Introduction

This retrospective assessment presents a summary of ecological features which had the potential to be residually affected by the legacy of extractive works undertaken at Drumbeagh, Mountcharles, Co. Donegal. This rEIAR is to accompany a substitute consent application for the extraction and processing activities that have been carried out to date.

This Chapter of the rEIAR evaluates the importance of the ecological resources past and present and defines the degree of significance of potential impacts resulting from the historic development through until the present day. The report also identifies appropriate mitigation measures and defines residual impacts should they be identified. Particular attention has been paid to species and habitats of ecological importance. These include species and habitats with national and international protection under the Wildlife Acts 1976 to 2018 (as Amended), EU Habitats Directive 92/43/EEC and EU Birds Directive 2009/147/EC.

The full description of the development is provided in Chapter 3, *Project Description*, of this EIAR.

The chapter is structured as follows:

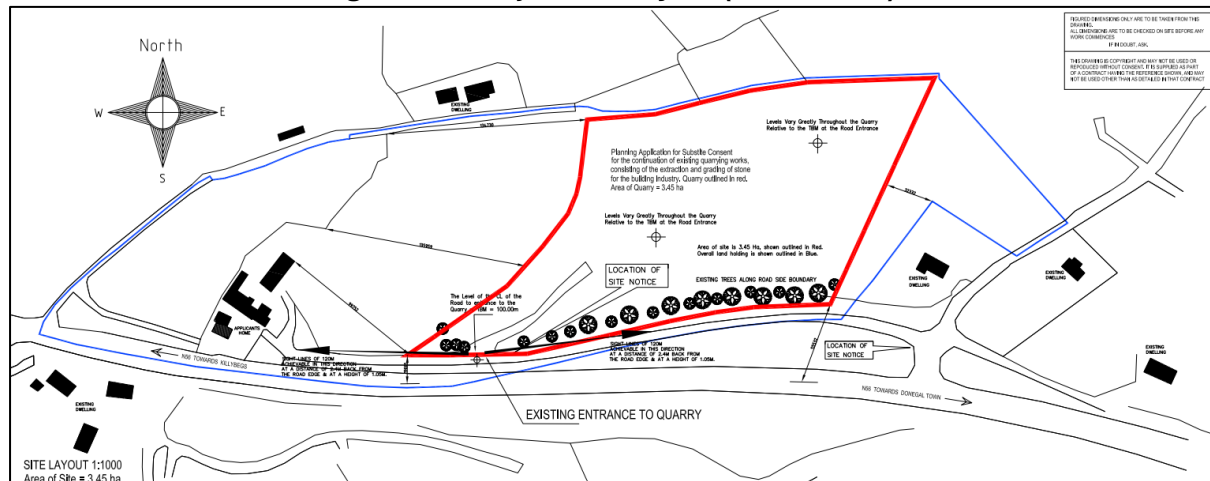
- The Introduction provides a description of the legislation, guidance, and policy context applicable to Biodiversity, Flora and Fauna.
- This is followed by a comprehensive description of the ecological survey and impact assessment methodologies that were followed to inform the robust assessment of 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 regarding each phase of the development. Potential Cumulative effects in combination with other projects are also fully assessed.
- Proposed (remedial) 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 past and predicted effects on Biodiversity, Flora and Fauna.

The following defines terms utilised in this chapter:

- For the purposes of this rEIAR, the red line site as submitted for planning subject to this application for substitute consent is referred to as the subject site (Figure 6.1).
- “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. ZOI’s differ depending on the sensitivities of habitats and species and were assigned in accordance with best available guidance and through adoption of the precautionary approach.

Figure 6.1 below shows the current site layout.

Figure 6.1: Subject Site layout (not to scale)



6.2 Requirements for Ecological Impact Assessment

National and European legislation and Policy set out the requirement for the ecological impact assessment of development.

6.2.1 National Legislation

The Wildlife Acts (1976/2000) provides legal protection to various species from anthropogenic interference with licensing providing the only derogation. The 2000 amendment set out the designation of NHAs and pNHAs. This designation is to provide protection to species and habitats found therein. pNHAs were proposed in 1995 but have yet to be statutorily approved. However, the NPWS considers pNHAs of significant value for flora and fauna. NHAs, pNHAs and the species therein are considered Key Ecological Receptors in this assessment.

Rare plant species are afforded protection from cutting, picking and damage and their habitats are protected from alteration, interference, and damage under The Flora Protection Order 1999. Any rare plant species listed are considered Key Ecological Receptors in this assessment.

6.2.2 National Policy

The United Nations Convention on Biological Diversity (CBD) places an obligation on U.N member states to develop national strategies and action plans for the conservation and sustainable use of biodiversity. Out of this requirement the Irish National Biodiversity Action Plan was formed. The Current National Biodiversity Action Plan 2023 -2030 expands on the targets set out in the previous iteration. The principal aim of this plan is to deliver the transformative changes required to the ways in which we value and protect nature. The plan highlights the following measures as significant in the context of the principal objective of mainstreaming biodiversity in decision making across all sectors of the economy:

- Objective 1 - Adopt a Whole of Government, Whole of Society Approach to Biodiversity
- Objective 2 - Meet Urgent Conservation and Restoration Needs
- Objective 3 - Secure Nature's Contribution to People
- Objective 4 - Enhance the Evidence Base for Action on Biodiversity
- Objective 5 - Strengthen Ireland's Contribution to International Biodiversity Initiatives

6.2.3 European Legislation

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna) formed a basis for the designation of Special Areas of Conservation (SAC's). Similarly, Special Protection Areas are legislated for under the Birds Directive (Council Directive 79/409/EEC on the

Conservation of Wild Birds). Collectively, SACs and SPAs are referred to as Natura 2000 sites. In general terms, they are of exceptional importance in terms of rare, endangered or vulnerable habitats and species within the European Community. Under Article 6(3) of the Habitats Directive an Appropriate Assessment must be undertaken for any plan or project that is likely to have a significant effect on the conservation objectives of a Natura 2000 site. An Appropriate Assessment is an evaluation of the potential impacts of a plan or project on the conservation objectives of a Natura 2000 site, and the development, where necessary, of mitigation or avoidance measures to preclude negative effects. The main aim of the EU Habitats Directive is to “contribute towards ensuring biodiversity through the conservation of natural habitats of wild fauna and flora in the European territory of the Member States to which the treaty applies”. The Directive was originally transposed into Irish law by the European Communities (Natural Habitat) Regulations, S1 94/1997. However, two judgments of the Court of Justice of the EU (CJEU) – notably cases C-418/04 and C-183/05 - found that Ireland had not adequately transposed the two Directives. Therefore, Part 6 of the European Communities (Birds and Natural Habitats) Regulations 2011-2015 is now the relevant part dealing with the protection of flora and fauna since the revoke of the European habitats Regulations of 1997. This consolidates the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats) (Control of Recreational Activities) Regulations 2010, as well as addressing transposition failures identified in CJEU judgments.

Article 6 (3) of the Habitats Directive states that:

“Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public”.

As such any project likely to have a significant effect, either individually or in combination with other plans or projects, upon the conservation objectives of a Natura 2000 site must undergo an assessment of its implications on relevant Natura 2000 sites.

A separate remedial Appropriate Assessment Screening Report (rAAsr) has been prepared to examine the potential effects of this development on the Natura 2000 network and to inform appropriate assessment by the consent authority. Furthermore, the species and habitat protected under European legislation are considered key ecological receptors in this assessment.

The EIA Directive (85/337/EEC) is in force since 1985 and applies to a wide range of defined public and private projects, which are defined in Annexes I and II:

- Mandatory EIA: all projects listed in Annex I are considered as having significant effects on the environment and require an EIA (e.g. long-distance railway lines, motorways and express roads, airports with a basic runway length ≥ 2100 m, installations for the disposal of hazardous waste, installations for the disposal of non-hazardous waste > 100 tonnes/day, wastewater treatment plants > 150.000 p.e.).
- Discretion of Member States (screening): for projects listed in Annex II, the national authorities have to decide whether an EIA is needed. This is done by the "screening procedure", which determines the effects of projects on the basis of thresholds/criteria or a case-by-case examination. However, the national authorities must take into account the criteria laid down in Annex III. The projects listed in Annex II are in general those not included in Annex I (railways, roads waste disposal installations, wastewater treatment plants), but also other types such as urban development projects, flood-relief works, changes of Annex I and II existing projects)

The EIA Directive of 1985 has been amended three times, in 1997, in 2003 and in 2009:

- Directive 97/11/EC brought the Directive in line with the UN ECE Espoo Convention on EIA in a Transboundary Context. The Directive of 1997 widened the scope of the EIA Directive by increasing the types of projects covered, and the number of projects requiring mandatory environmental impact assessment (Annex I). It also provided for new screening arrangements, including new screening criteria (at Annex III) for Annex II projects, and established minimum information requirements.
- Directive 2003/35/EC was seeking to align the provisions on public participation with the Aarhus Convention on public participation in decision-making and access to justice in environmental matters.
- Directive 2009/31/EC amended the Annexes I and II of the EIA Directive, by adding projects related to the transport, capture and storage of carbon dioxide (CO₂).

The initial Directive of 1985 and its three amendments have been codified by DIRECTIVE 2011/92/EU of 13 December 2011. Directive 2011/92/EU has been amended in 2014 by DIRECTIVE 2014/52/EU.

6.3 Guidance Documents

Guidance from the National Roads Authority forms the basis of both survey techniques and assessment methodology. The documents 'NRA Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2' (NRA, 2009) and 'NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009)' were initially designed in the context of assessing the development of roads. However, the guidelines follow standardised techniques and are considered good practice in terms of ecological assessment. Guidance documents that informed this assessment include:

- Chartered Institute of Ecology and Environmental Management (CIEEM) (2019). Guidelines for Ecological Impact Assessment.
- Chartered Institute of Ecological and Environmental Management (CIEEM) (2012). Preliminary Ecological Appraisal.
- Fossitt JA (2000). A Guide to Habitats in Ireland.
- The Heritage Council (2011) Habitat Survey Guidelines: A Standard Methodology for Habitat Survey and Mapping in Ireland.
- Draft Revised guidelines on the information to be contained in Environmental Impact Statements (EPA, 2017).
- Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment. Department of the Environment, Community and Local Government DoEHLG (2013).
- Guidelines for assessment of Ecological Impacts of National Road Schemes, (NRA, 2009). Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2009).
- Environmental Assessment and Construction Guidelines (NRA, 2006).
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (Environmental Protection Agency (EPA), 2003).
- Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2022).
- European Commission Guidance on the preparation of the Environmental Impact Assessment Report (2017)
- Environmental Protection Agency (EPA) 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (May 2022).

6.4 Statement of Authority

This Chapter of the EIAR has been compiled by Daniel Faulkner with input from Colin Farrell. Daniel has a BSc in Environmental Science from NUIG and MSc in Environmental Sustainability from UCD. He has been involved in various projects requiring Environmental Impact Assessment since 2020.

6.5 Methodology

Prior to assessing the ecological impact of a development, the environmental baseline must first be described. Baseline ecological conditions were assessed in line with CIEEM (2018) 'Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine '. The baseline was assessed through desk and field survey methodology which are described in the following sections.

6.5.1 Desk Study

The desk study was informed by the following resources

- EPA Map Viewer
- Donegal County Council Map Viewer
- NPWS Map Viewer
- NPWS records
- Inland Fisheries Reports
- National Biodiversity Data Centre records and map viewer
- Geohive.ie

6.5.2 Field Study

Multiple field surveys were carried out as part of this assessment from January – June 2022, and then January to July 2024. The following section describes the surveys carried out, the timing of the surveys and the guidance followed.

6.5.2.1 Site walkover

Initial multidisciplinary site walkovers were carried out over multiple site visits spanning a six-month period from January – June 2022, a further suite of walkovers was conducted from January to July 2024. The purpose of this exercise was to understand the context of the site and act as a 'ground-truthing exercise' to confirm any insights inferred from desk study as to the nature of the site. Annotations were marked on a sample map indicating the approximate location of any significant features noted such as important habitat, plant species or signs of important fauna. Incidental sightings of birds and invasive species were also noted, as relevant. Information collected during site walkovers informed the preceding survey work.

6.5.2.2 Habitat Survey

Following the multidisciplinary site walkovers, a more in-depth Phase 1 habitat survey was conducted on 04/06/2024. All habitats were classified according to Fossitt (2000)¹. The habitat study was conducted to provide an understanding of the ecological baseline of the quarry site. Data gathered from habitat surveys was used to produce a thematic map illustrating the relative position and scale of habitats in the quarry site and surrounding environs. This was compared to the Ordnance Survey Ireland (OSI) maps for the site prior to the existence of the current workings. Following on from this an impact assessment was carried out to establish any impacts of quarrying related activities on habitats, flora and fauna (biodiversity features). Guidelines from the Heritage Council were followed, and classification were designated according to Fossitt's. However, position and scale of habitats shown are approximate and should be considered only as a broad representation of the study area.

¹ J. Fossitt. (2000) A Guide to Habitats in Ireland. The Heritage Council, Dublin

6.5.2.3 Mammal Surveys

The information gathered from desk study methods in addition to ecological surveys informed the focus of targeted terrestrial fauna surveys. Relevant surveys as detailed below were conducted within the footprint of the development.

6.5.2.3.1 Badger

A preliminary assessment of potential habitat was conducted to determine if further surveys were required. The assessment covered the entire footprint of the development. The assessment intended to identify any potential signs of badger such as setts/tracks/latrines. The survey was conducted with respect to NRA guidelines (2009).

6.5.2.3.2 Otter

An otter survey for the site was deemed to be unnecessary after conducting a thorough site walkover due to the lack of supporting habitat onsite.

6.5.2.3.3 Other mammals

Any evidence of mammals that were not the subject of dedicated surveys was noted during site walkovers.

6.5.2.3.4 Bats

A daytime bat walkover (DBW) was conducted. Structures and trees were inspected for potential roost features. Roost suitability was assigned in the context of species that are known to occur in the wider landscape of the development. Following this an assessment of foraging/flight path provision of the habitat on site was undertaken.

6.5.2.4 Bird Survey

A series of bird observation reports was conducted during spring – summer 2024 which covered the entire footprint of the subject site. Lands within, and adjacent to the development boundary were walked in a manner allowing the surveyor to come within 50m of all habitat features. Birds were identified by sight and sound, and general location was recorded. Physical parameters such as weather conditions, and the presence of any disturbance factors were also noted. Guidelines from the following were considered:

- CIEEM Bird census and survey techniques, Gregory RD, Gibbons DW and Donald PF (2004)
- CIEEM Guidance for bird surveys in relation to development, Good practice guidance for birds, Keith Ross and James Latham
- Common bird census (CBC) methodology
- British Trust for Ornithology's (BTO's) Survey (WeBS) methodology
- Birdwatch Ireland Countryside Bird Survey manual

6.5.2.5 Amphibian and Reptile Survey

An amphibian and reptile survey was carried out on 04/06/2024. This involved searching for basking animals on banks, piles of wood or laying out artificial refuges like corrugated iron sheets which were bedded down well into the vegetation. No amphibians or reptiles were noted throughout the survey or throughout the multiple walkovers conducted.

6.5.2.6 Invasive Species Surveys

During initial multidisciplinary site walkover, invasive species were noted. A full invasive species survey and mapping exercise was conducted. Focus was placed on identifying the location and extent of any third schedule species listed in the European Communities Birds and Natural Habitats Regulations 2011. An Invasive Alien Species Management Plan was produced.

6.5.2.7 Field Survey Limitations

Initial surveys were conducted in 2022, since that time some aspects of the site have changed. A recent suite of surveys in June 2024 provided up to date data for this survey. The timing of surveys was good for most vegetation. With regard to faunal surveys, wintering birds would be missed during summer surveys. Mid-summer amphibian walkover is slightly later than ideal timing for observing breeding frog and newt. No limitations with regard to bat walkovers and non-volant mammal habitat appraisal were encountered.

6.5.3 Impact and Effect Assessment Methodology

This sub section will describe the methodology followed to identify key ecological receptors (KER) and their significance before describing the methodology followed to characterise impacts and effects on identified KERs.

6.5.3.1 Identification of Key Receptors

The culmination of desk/field survey and consultation with relevant bodies informed the identification of Key Ecological Receptors. Target receptors that were found to likely occur with the zone of impact of 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)/ Special Protection Areas (SPA) within the likely zone of impact
- Species protected under the Wildlife Acts 1976-2019
- Species protected under the Flora Protection Order 2015

6.5.3.2 Assessing the Importance of Receptors

Ecological evaluation and impact assessment methodologies in the following sections have implemented guidance from the NRA. An outline for this methodology is provided in 'Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009)'. This methodology follows the same modality as the assessment criteria described by CIEEM (2018).

This guidance provides a scale of importance for features in a geographical context. Importance ranges from:

- International/European
- National
- Regional (County)
- Local (High Value)
- Local (Low Value)

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.

Ecological receptors considered to be of International, National, Regional or Local (Higher Value) are to be considered KERs provided a pathway for significant effects exist thereon. Ecological receptors of Local importance (Lower Value) are not considered KERs.

6.5.3.3 Characterising impacts and effects on Key Ecological Receptors

Once the Baseline has been established, impact on KERs can be assessed and mitigation/compensation or enhancement measures can be put in place to negate any negative effect. Impacts will be characterised according to CIEEM guidance (2019) in addition to EPA guidance (2022) document 'Guidelines on the information to be contained in environmental impact assessment reports. The following criteria was used to characterise impacts:

- **Magnitude** relates to the quantum of effect, for example the number of individuals affected by an activity. Described in Table 6.1
- **Extent** should also be predicted in a quantified manner and relates to the area over which the effect occurs.
- **Duration** is intended to refer to the time during which the effect is predicted to continue, until recovery or re-instatement.
- **Reversibility** should be addressed by identifying whether an effect is ecologically reversible either spontaneously or through specific action; and,
- **Timing/frequency** of effects in relation to important seasonal and/or life-cycle constraints should be evaluated. Similarly, the frequency with which activities (and associated effects) would take place can be an important determinant of the effect on receptors.

6.5.3.4 Assessing the significance of effect

The ecological significance of effects is described using guidance provided in section 5 of CIEEM guidelines (2019). When assessing ecological impacts, a 'significant effect' can be described as an effect that supports or undermines biodiversity conservation objectives for important ecological features. Effects can be considered significant at a variety of geographic scales from international to local.

Any assessment of effect should take account of:

- Construction and operational phases.
- direct, indirect, and synergistic effects.
- and those that are temporary, reversible, and irreversible.

The EPA provides the following terminology to describe duration of effects:

- Momentary effects - Effects lasting from seconds to minutes
- Brief effects - Effects lasting less than a day
- Temporary effects - Effects lasting less than a year
- Short-term – 1 to 7 years
- Medium term – 7 to 15 years
- Long term – 15 to 60 years
- Permanent – over 60 years
- Reversible effects - Effects that can be undone, for example through remediation or restoration.

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 language suggested by the EPA (2022) to describe the magnitude of effects is outlined in Table 6.1.

Table 6.1 Magnitude of Impacts

Magnitude	Description
No change	No discernible change in the ecology of the affected feature.
Imperceptible Effect	An effect capable of measurement but without noticeable consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effect	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effect	An effect that alters the character of the environment that is consistent with existing and emerging trends.
Significant Effect	An effect which, by its character, its magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant Effect	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effect	An effect which obliterates sensitive characteristics

Effects on Key ecological receptors can be of varying quality as described by the EPA (2022) they can be one of the following:

- **Negative** - A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
- **Neutral** - No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
- **Positive** - A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).

The following are key considerations when determining significance:

- Integrity
- Conservation Status

Integrity refers to the essential unity of a site in terms of its ecological structure and function. NRA (2009) describes integrity as “the coherence of 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. Impacts resulting in adverse changes to those ecological structures and functions would be significant.”

Conservation Status

An impact on the conservation status of a habitat or species is considered significant if it will result in a change in conservation status. According to CIEEM (2019) 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 methodologies, 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).

6.5.3.5 Incorporating Mitigation

Section 6.6 of this rEIA assesses the potential effects of the existing development to ensure that all effects on sensitive ecological receptors are adequately addressed. Where significant effects on sensitive ecological receptors are found, mitigation is incorporated into the project design or layout to address such impacts. The implemented mitigation measures avoid or reduce or offset potential significant residual effects, post mitigation. The primary mitigation employed should be mitigation by avoidance.

6.6 Establishing the Baseline

The following sections provide the results from desk and field studies and describe the baseline ecological conditions at the quarry site.

6.6.1 Desk Study

This section describes the results of review of available public information including:

- EPA Map Viewer
- Donegal County Council Map Viewer
- NPWS Map Viewer
- NPWS records
- Inland Fisheries Reports
- National Biodiversity Data Centre records and map viewer
- Geohive.ie
- A collection of relevant reports and records

6.6.1.1 Baseline Hydrology

Full details of watercourses, waterbodies and water quality relating to the development are presented in chapter 8 'Water'. The subject site is located within the Water Framework Directive (WFD) Catchment 37 Donegal Bay North (GBNIIENW) and the WFD sub catchment Eany (Water)_SC_010. A tributary of the Eany Water River (EPA code: IE_NW_37E030350) flows along the northern boundary of the site, and through the southern boundary of the site. The site is

located in the Eany Water sub basin catchment. The Eany Water River flows into the sea at Inver Bay approximately 3 km southwest of the subject site. The hydrological distance from the site to Inver Bay is approximately 4.67 km. The site is outside any *Margaritifera* catchment and does not influence any waters designated under the Salmonid Regulations (SI 293/1988). There are no EPA monitoring stations on the tributary of the Eany water system leading from the site. There are a number of EPA monitoring stations in other unconnected tributaries of the Eany water to the north of the application site. The latest Q values (2022) from these stations indicate both good and high ecological status.

Figure 6.2: Hydrological Connections



(Created using QGIS software and NPWS datasets)

Water flow in and around the quarry is shown in Figure 6.2 above. There are effectively two outflows from the site. A small proportion of the runoff from the site flows north through a settlement pond, which has been unmanaged, and onwards into a tributary of the Eany Water River. The majority of the runoff from the footprint of the site flows into a settlement pond located in the central southern part of the site. The outflow from this settlement pond flows into a vegetated drainage ditch and into an open drain at the entrance of the site. This drain is then culverted and flows southwest into a tributary of the Eany Water.

The processing area where stone is cut and guillotined is surfaced with concrete. The concrete is graded towards a sump covered by slatted concrete. All runoff from this area is directed to the sump. Water is recycled for use within the circular saws from the sump and there is no other outflow from this sump.

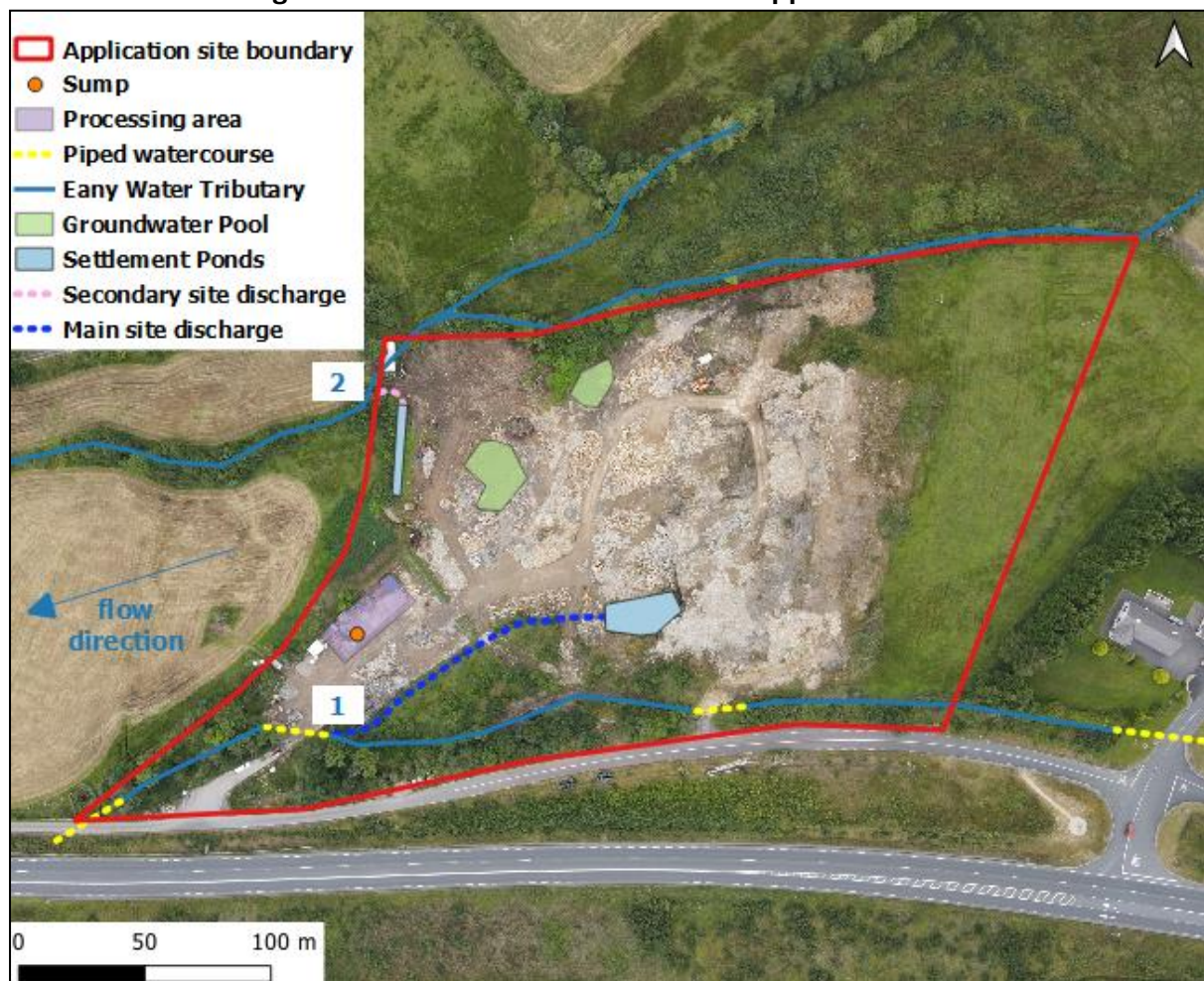
The current drainage flow directions for the site and surrounding areas were examined and identified within the site. The main surface water features are shown in Figure 6.3 below.

The general slope of ground is from northeast to southwest, and the main central settlement pond captures the vast majority of runoff from the site. A small area in the northwest of the site drains through a screening berm to a linear settlement pond in the northwest.

Stream tributaries of the Eany Water River system flow along the northern boundary of the site and through the southern edge of the site. The southern tributary is piped in several places through the site and the main effluent discharge from the central settlement pond discharges to this southern tributary (point 1, Figure 6.3) Discharge is via a 60m heavily vegetated open channel which provides a high degree of impediment and hence treatment of the effluent. Photograph 8.1 shows this impeded pathway. Discharge from the linear settlement pond in the northwest is to the northern tributary of Eany Water (Point 2, Figure 6.3)

The product at the site is cut stone and dimension stone so minimal processing is required. There is no crushing, screening or washing of product. Processing activities include guillotining and cutting with a saw. These activities are carried out in a dedicated area in the west of the site which is underlain by a concrete base draining to a sump. There is no outflow to this sump, and the applicant states that he has never known it to overflow. Small amounts of water are recycled for use with the cutting saws. The sludge at the base of the sump is periodically cleaned out and used to supplement screening berms.

Figure 6.3 Water movement within the application site



(Created with QGIS and Greentrack aerial imagery)

The GSI have characterised the underlying groundwater body (GWB) as the Frosses groundwater body and produced a conceptual model of the Frosses GWB. These are the main characteristics of the Frosses GWB:

- The GWB is mainly bounded by differing types of aquifers. A small portion of the SW boundary is coastline. The topography ranges from gently sloping to hilly, with a small area of drumlins in the north/northwest. Elevations range from sea level to 150 mAOD.
- The sole rock group in this body is Dinantian Sandstone, which is considered to have the potential for relatively high fissure permeability. Most of the unconfined groundwater flux is expected to be in the uppermost part of the aquifer comprising a broken and weathered zone typically less than 3m thick, a zone of interconnected fissuring typically less than 40m, and a zone of isolated fissuring typically less than 150m.
- Transmissivity values are expected to be 10-50 m² /d although may be as high as 100-150 m² /d, especially in the vicinity of faults. Storativity is likely to be relatively good.
- High fissure permeability aquifers can generally support regional scale flow systems. Long flow paths (e.g. 2000 m) can be expected although are likely to be shorter (100-300 m) as this GWB mainly constitutes a discharge area.
- Recharge will occur diffusely through the thinner and/or more permeable subsoil and rock outcrops, although is limited by any thicker low permeability subsoil and bedrock.
- The main discharges are to the streams, rivers and springs within the GWB, and seeps along the coastline. Overall, the flow direction is to the southwest, as determined by the topography.

A well bedded blue and brown/buff sandstone, part of the Mullaghmore Sandstone Formation, is present on site. The aquifer underlying the application site is described by the GSI as a Locally Important Aquifer (Lm) – Bedrock which is Generally Moderately Productive. Locally important aquifers are capable of ‘good’ well yields 100-400 m³/day. Information reported in the County Donegal Groundwater Protection Scheme, Volume I July 2004, produced by Donegal County Council and the GSI highlight that groundwater will circulate primarily through fissures and cracks as these rock units do not show significant intergranular permeability. Fissure permeability is generally more developed in the top 20-30 m of the aquifer and the Mullaghmore Sandstone Formation tends to have calcareous cement that is prone to dissolution leading to increasing permeability. The underlying aquifer is expected to be moderately productive but also variable dependent on the fracture pattern and extent. The Dinantian Sandstones, of which the Mullaghmore Formation is a member, make up approximately 3% of the aquifers in county Donegal.

6.6.1.2 Designated Sites

The impacts of the existing development on European sites are examined in the accompanying rAAsr. As per EPA guidance (2022) this biodiversity chapter will not repeat the information provided but instead will incorporate the key findings provided in same.

The rAAsr found that due to the separation of the site from European sites, the nature and scale of the proposed development and the nature and scale of the pathways for effect, that there is no likelihood of significant negative effects in the absence of mitigation on any European site.

Several nationally designated sites occur within 15km of the subject site. These include Proposed Natural Heritage Areas (pNHAs). No designated Natural Heritage Areas (NHAs) were noted within the 15km radius. Table 6.2 provides proximal Nationally Designated Sites and a preliminary impact determination for each.

Table 6.2 Impact Determination for Nationally Designated Sites.

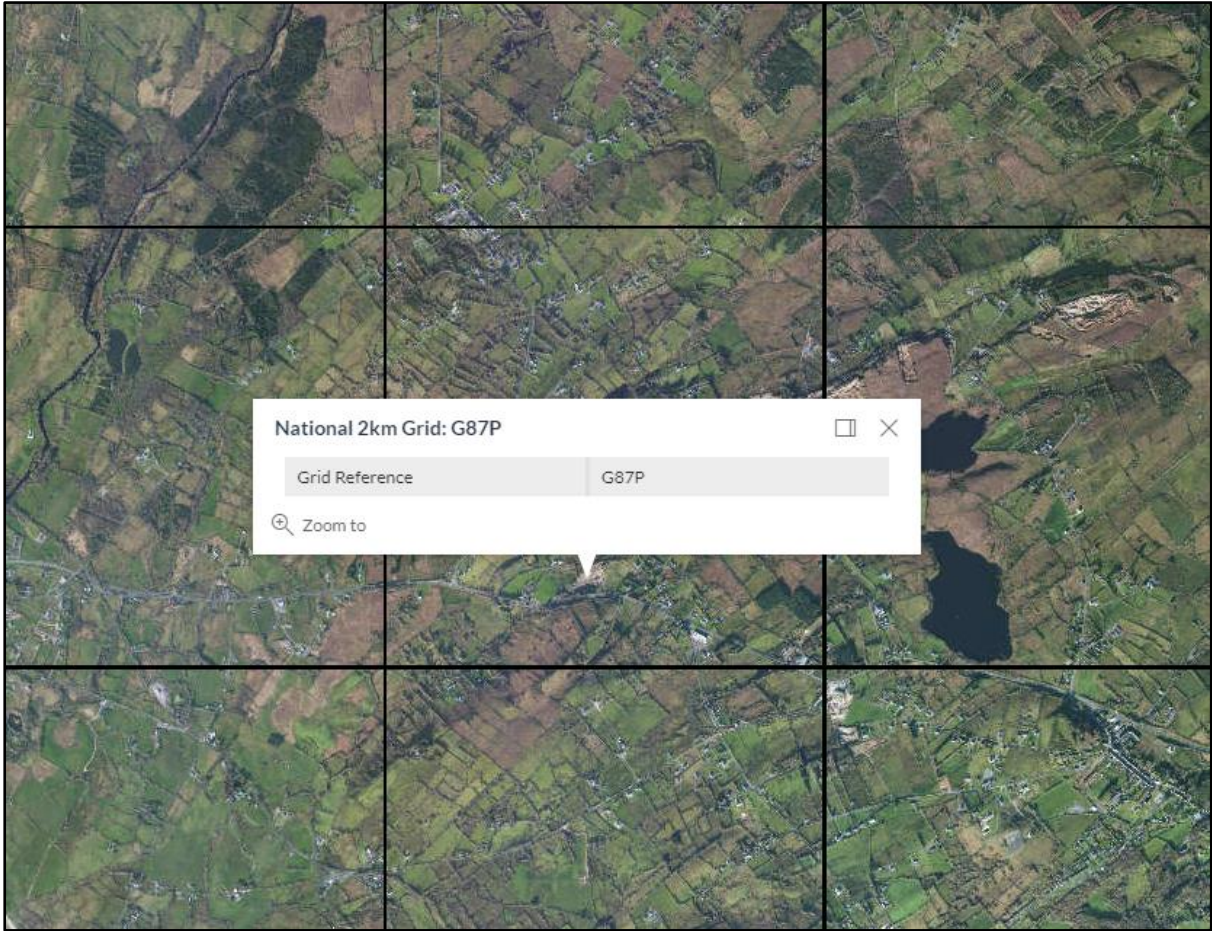
Designated Site	Distance	Feature of Interest	Impact Determination
Donegal Bay (Murvagh) 000133	2.90 SE	Coastal Habitat	No SPR Chain for effect surface water pathway from site drains to sea at Inver Bay after c.4.9km hydrological distance. Where surface water from site enters the sea there is significant separation from the pNHA. There is no likelihood of effect.
Meenaguse/Ardbane Bog 000172	6.65 N	Peatland	No Spr Chain for effect to this pNHA
Meenybraddan Bog 001177	7.13 NW	Bog and Flush, Lake	No Spr Chain for effect to this pNHA
Lough Nillan Bog (Carrickatlieve) 000162	7.86 N	Peatland	No Spr Chain for effect to this pNHA
Durnesh Lough 000138	8.07 S	Lagoons, Molinia Meadows	No Spr Chain for effect to this pNHA
St. John's Point 000191	11.26 SW	Dry Grasslands, Molinia Meadows, Alkaline fens, coastal habitats, Marsh Fritillary, Marine Mammals	No Spr Chain for effect to this pNHA
Ballintra 000115	11.60 SE	Dry Heath, Limestone Pavement	No Spr Chain for effect to this pNHA
Lough Eske And Ardnamona Wood 000163	11.70 NE	Salmon and Freshwater Pearl Mussell, Old oak wood, killarney fern, Springs	No Spr Chain for effect to this pNHA
Meenaguse Scragh 001880	12.07 N	Atlantic Wet Heath	No Spr Chain for effect to this pNHA
Carricknahorna Lough And Lough Gorman 002068	13.02 S	Marl Lakes, Limestone Pavement, Peatland	No Spr Chain for effect to this pNHA
Erne Estuary/Finner Dunes 000139	14.23 S	Coastal habitat, Waterfowl	No Spr Chain for effect to this pNHA
West of Ardara/Maas Road 000197	14.70 NW	Coastal Habitats, Oligotrophic waters, Salmon, Otter, Seal, Marsh Fritillary, Peatlands, Grasslands, Slender Naiad	No Spr Chain for effect to this pNHA
Owendoo and Cloghervaddy Bogs 002046	14.74 NE	Peatlands	No Spr Chain for effect to this pNHA

No Natural Heritage Areas occur within 15km of the proposed development. There is no pathway for significant effect on any proposed Natural Heritage Area.

6.6.1.2 Flora and Fauna Records and Implications for Field Study

Data from the National Biodiversity Data Centre was used for this desk study. A data report for the 2km National Grid Square of the proposed development G87P was generated on the National Biodiversity Data Centre Map Viewer on 29/07/2024. The data is collated and presented in Table 6.3 through 6.10.

Map 6.1: Location of subject site within National Grid G87



(National Biodiversity Data Centre Map Viewer, <https://maps.biodiversityireland.ie/Map>, accessed 29/07/2024)

6.6.1.2.1 Mammals

Table 6.3 provides non-volant mammal records within G87P.

Table 6.3: Mammal Records

Species Name	Count	Date	Dataset	Designation
Brown Rat (<i>Rattus norvegicus</i>)	1	09/12/2014	Atlas of Mammals in Ireland 2010-2015	Invasive Species: Invasive Species Invasive Species: Invasive Species >> High Impact Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
Eurasian Badger (<i>Meles meles</i>)	1	19/04/2017	Mammals of Ireland 2016-2025	Protected Species: Wildlife Acts
Eurasian Red Squirrel (<i>Sciurus vulgaris</i>)	4	19/04/2018	Mammals of Ireland 2016-2025	Protected Species: Wildlife Acts
Irish Hare (<i>Lepus timidus subsp. hibernicus</i>)	6	26/12/2022	Mammals of Ireland 2016-2025	
Red Fox (<i>Vulpes vulpes</i>)	1	26/02/2017	Mammals of Ireland 2016-2025	

6.6.1.2.2 Bats

Table 6.4 presents data of bat records within G87P

Table 6.4: Bat Records

Species Name	Count	Date	Dataset	Designation
Pipistrelle (<i>Pipistrellus pipistrellus sensu lato</i>)	1	16/06/2007	National Bat Database of Ireland	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	2	16/06/2007	National Bat Database of Ireland	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts

The data presented in Table 6.5 presents the bat landscape suitability index for G87P. This index was accessed through the National Biodiversity Data Centre and is calculated based on research on bat landscape and habitat requirements². The index ranges on a scale from 0 to 59 depending on the suitability of the habitats and resources available.

Table 6.5: Breakdown of All Bats Suitability Index by Species

Species	Suitability Index
All Bats	26.89
<i>Pipistrellus pygmaeus</i>	44
<i>Plecotus auritus</i>	33
<i>Pipistrellus pipistrellus</i>	36
<i>Rhinolophus hipposideros</i>	1
<i>Nyctalus leisleri</i>	35
<i>Myotis mystacinus</i>	7
<i>Myotis daubentonii</i>	43
<i>Pipistrellus nathusii</i>	5
<i>Myotis nattereri</i>	38

6.6.1.2.4 Birds

Records of bird species in National Grid G87P are provided in Table 6.6 below.

² Lundy, M.G., Aughney, T., Montgomery, W.I., & Roche, N., (2011) Landscape conservation for Irish bats & species-specific roosting characteristics. Bat Conservation Ireland.

Table 6.6: National Biodiversity Data Centre and Bird Atlas of Ireland records in Hectad C30

Species Name	Count	Date	Dataset	Designation
Black-billed Magpie (<i>Pica pica</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
Blue Tit (<i>Cyanistes caeruleus</i>)	2	10/06/2017	Birds of Ireland	
Chaffinch (<i>Fringilla coelebs</i>)	2	10/06/2017	Birds of Ireland	
Common Blackbird (<i>Turdus merula</i>)	2	10/06/2017	Birds of Ireland	
Common Bullfinch (<i>Pyrrhula pyrrhula</i>)	2	10/06/2017	Birds of Ireland	
Common Buzzard (<i>Buteo buteo</i>)	4	11/08/2021	Birds of Ireland	
Common Cuckoo (<i>Cuculus canorus</i>)	2	17/05/2017	Birds of Ireland	
Common Grasshopper Warbler (<i>Locustella naevia</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List.
Common Kingfisher (<i>Alcedo atthis</i>)	1	31/12/2011	Bird Atlas 2007 - 2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List.
Common Pheasant (<i>Phasianus colchicus</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species.

Species Name	Count	Date	Dataset	Designation
Common Starling (<i>Sturnus vulgaris</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List.
Common Whitethroat (<i>Sylvia communis</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
Eurasian Jackdaw (<i>Corvus monedula</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
Eurasian Sparrowhawk (<i>Accipiter nisus</i>)	2	28/12/2022	Birds of Ireland	
European Robin (<i>Erithacus rubecula</i>)	2	10/06/2017	Birds of Ireland	
Great Tit (<i>Parus major</i>)	1	10/06/2017	Birds of Ireland	
Hedge Accentor (<i>Prunella modularis</i>)	2	10/06/2017	Birds of Ireland	
Hooded Crow (<i>Corvus cornix</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
House Sparrow (<i>Passer domesticus</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List.
Lesser Redpoll (<i>Carduelis cabaret</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
Mallard (<i>Anas platyrhynchos</i>)	1	31/12/2011	Bird Atlas 2007 - 2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species.

Species Name	Count	Date	Dataset	Designation
Meadow Pipit (<i>Anthus pratensis</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
Mistle Thrush (<i>Turdus viscivorus</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
Reed Bunting (<i>Emberiza schoeniclus</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
Rook (<i>Corvus frugilegus</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
Sand Martin (<i>Riparia riparia</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List.
Sky Lark (<i>Alauda arvensis</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List.
Song Thrush (<i>Turdus philomelos</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
White Wagtail (<i>Motacilla alba</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
Willow Warbler (<i>Phylloscopus trochilus</i>)	2	10/06/2017	Birds of Ireland	
Winter Wren (<i>Troglodytes troglodytes</i>)	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	

6.6.1.2.4 Amphibians and Reptiles

Table 6.7 provides records for amphibians and reptiles within G87P.

Table 6.7: Amphibians and Reptiles

Species Name	Scientific Name
Common Frog	<i>Rana temporaria</i>
Smooth Newt	<i>Lissotriton vulgaris</i>

6.6.1.2.5 Invertebrates

Table 6.8 provides records of Invertebrate Species within National 2km Grid Square G87P.

Table 6.8 Invertebrate Records

Species Name	Count	Date	Dataset	Status
Common Blue (<i>Polyommatus icarus</i>)	1	11/06/2021	Atlas of Butterflies in Ireland 2021	
Green-veined White (<i>Pieris napi</i>)	4	04/08/2021	Atlas of Butterflies in Ireland 2021	
Holly Blue (<i>Celastrina argiolus</i>)	1	03/05/2020	Atlas of Butterflies in Ireland 2021	
Large White (<i>Pieris brassicae</i>)	1	22/05/2018	Atlas of Butterflies in Ireland 2021	
Meadow Brown (<i>Maniola jurtina</i>)	2	04/08/2021	Atlas of Butterflies in Ireland 2021	
Orange-tip (<i>Anthocharis cardamines</i>)	4	02/05/2021	Atlas of Butterflies in Ireland 2021	
Peacock (<i>Inachis io</i>)	8	11/08/2021	Atlas of Butterflies in Ireland 2021	
Red Admiral (<i>Vanessa atalanta</i>)	1	20/06/2020	Atlas of Butterflies in Ireland 2021	
Ringlet (<i>Aphantopus hyperantus</i>)	2	26/07/2020	Atlas of Butterflies in Ireland 2021	
Silver-washed Fritillary (<i>Argynnis paphia</i>)	1	09/08/2020	Atlas of Butterflies in Ireland 2021	
Small Copper (<i>Lycaena phlaeas</i>)	1	03/06/2018	Atlas of Butterflies in Ireland 2021	
Small Heath (<i>Coenonympha pamphilus</i>)	2	03/06/2018	Atlas of Butterflies in Ireland 2021	Threatened Species: Near threatened.
Small Tortoiseshell (<i>Aglais urticae</i>)	2	26/06/2023	Atlas of Butterflies in Ireland 2021	
Speckled Wood (<i>Pararge aegeria</i>)	2	28/05/2018	Atlas of Butterflies in Ireland 2021	
Common Blue Damselfly (<i>Enallagma cyathigerum</i>)	1	17/07/2022	Dragonfly Ireland 2019 to 2024	
Bombus (<i>Bombus lucorum</i>)	2	22/03/2019	Bees of Ireland	
Bombus (<i>Bombus terrestris</i>)	2	27/03/2022	Bees of Ireland	
Common Carder Bee (<i>Bombus (Thoracomus) pascuorum</i>)	1	24/05/2018	Bees of Ireland	
Early Bumble Bee (<i>Bombus (Pyrobombus) pratorum</i>)	1	30/05/2018	Bees of Ireland	

Species Name	Count	Date	Dataset	Status
Greater Horntail Wasp (<i>Urocerus gigas</i>)	1	01/08/2016	Sawflies of Ireland	
Grey Mining Bee (<i>Andrena (Melandrena) cineraria</i>)	1	24/05/2018	Bees of Ireland	
Small Garden Bumble Bee (<i>Bombus (Megabombus) hortorum</i>)	1	24/05/2018	Bees of Ireland	
Silver-ground Carpet (<i>Xanthorhoe montanata</i>)	1	05/06/2018	Moths Ireland	
<i>Helophilus pendulus</i>	1	04/06/2018	Hoverflies (Syrphidae) of Ireland	
<i>Rhingia campestris</i>	1	06/06/2018	Hoverflies (Syrphidae) of Ireland	
<i>Sericomyia lappona</i>	1	04/06/2018	Hoverflies (Syrphidae) of Ireland	
7-spot Ladybird (<i>Coccinella septempunctata</i>)	1	08/04/2024	Ladybirds of Ireland	
Common Darter (<i>Sympetrum striolatum</i>)	1	20/09/2023	Dragonfly Ireland 2019 to 2024	

6.6.1.2.5 Vascular Plants

Records of Vascular Plants within 2km National Grid Square G87P are provided in Table 6.9

Table 6.9: Vascular Plant Species

Species Name	Count	Date	Dataset	Designation
Bilberry (<i>Vaccinium myrtillus</i>)	2	10/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Black Medick (<i>Medicago lupulina</i>)	1	03/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Blackthorn (<i>Prunus spinosa</i>)	2	20/04/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Bluebell (<i>Hyacinthoides non-scripta</i>)	1	02/05/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Bugle (<i>Ajuga reptans</i>)	1	31/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Coltsfoot (<i>Tussilago farfara</i>)	1	22/02/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Columbine (<i>Aquilegia vulgaris</i>)	2	10/04/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Common Bird's-foot-trefoil (<i>Lotus corniculatus</i>)	1	03/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Common Cottongrass (<i>Eriophorum angustifolium</i>)	1	30/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Common Dog-violet (<i>Viola riviniana</i>)	1	13/03/2017	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Common Knapweed (<i>Centaurea nigra</i>)	2	06/11/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Common Mouse-ear (<i>Cerastium fontanum</i>)	1	30/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Common Spotted-orchid (<i>Dactylorhiza fuchsii</i>)	1	31/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Common Twayblade (<i>Listera ovata</i>)	1	03/07/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Cow Parsley (<i>Anthriscus sylvestris</i>)	1	31/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
<i>Euphrasia officinalis</i> agg.	1	26/06/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Foxglove (<i>Digitalis purpurea</i>)	2	31/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
<i>Fuchsia magellanica</i>	4	21/08/2016	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Germander Speedwell	2	19/06/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	

Species Name	Count	Date	Dataset	Designation
<i>(Veronica chamaedrys)</i>				
Guelder-rose <i>(Viburnum opulus)</i>	1	31/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Herb-Robert <i>(Geranium robertianum)</i>	1	07/11/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Himalayan Knotweed <i>(Persicaria wallichii)</i>	2	27/08/2015	National Invasive Species Database	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
Holly <i>(Ilex aquifolium)</i>	1	03/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Japanese Knotweed <i>(Fallopia japonica)</i>	1	27/08/2015	National Invasive Species Database	Invasive Species: Invasive Species Invasive Species: Invasive Species >> High Impact Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
Lesser Celandine <i>(Ranunculus ficaria)</i>	2	25/02/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Lesser Spearwort <i>(Ranunculus flammula)</i>	1	30/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Marsh-marigold <i>(Caltha palustris)</i>	2	12/05/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Meadow Thistle <i>(Cirsium dissectum)</i>	1	01/06/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Meadowsweet <i>(Filipendula ulmaria)</i>	1	17/07/2016	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Narrow-leaved Marsh-orchid <i>(Dactylorhiza traunsteinerioides)</i>	2	03/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Northern Marsh-orchid <i>(Dactylorhiza purpurella)</i>	1	31/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Primrose <i>(Primula vulgaris)</i>	1	02/05/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Ragged-Robin <i>(Lychnis flos-cuculi)</i>	1	30/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Ramsons	1	13/03/2017	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	

Species Name	Count	Date	Dataset	Designation
<i>(Allium ursinum)</i>				
Red Clover <i>(Trifolium pratense)</i>	1	30/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Ribwort Plantain <i>(Plantago lanceolata)</i>	1	31/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Selfheal <i>(Prunella vulgaris)</i>	1	02/05/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Silverweed <i>(Potentilla anserina)</i>	1	23/06/2016	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Sneezewort <i>(Achillea ptarmica)</i>	1	21/08/2016	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Snowberry <i>(Symphoricarpos albus)</i>	1	07/11/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Soft-rush <i>(Juncus effusus)</i>	1	21/08/2016	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Sun Spurge <i>(Euphorbia helioscopia)</i>	1	21/08/2016	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
<i>Taraxacum aggregate</i>	2	05/01/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Water Forget-me-not <i>(Myosotis scorpioides)</i>	1	30/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
White Clover <i>(Trifolium repens)</i>	1	30/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Wild Strawberry <i>(Fragaria vesca)</i>	1	02/05/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Wood Anemone <i>(Anemone nemorosa)</i>	2	02/05/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	

6.6.1.2.6 Invasive Species

Invasive species recorded with 2km National Grid Square G87P are presented in Table 6.10

Table 6.10 Invasive Species

Species Name	Scientific Name
Vertebrates	
Brown Rat	<i>Rattus norvegicus</i>
Flora	
Japanese Knotweed	<i>Fallopia japonica</i>
Himalayan Knotweed	<i>Persicaria wallichii</i>

6.6.1.4 Conclusions from Desk Study

Table 6.11 presents the conclusion of analysis of desk study data.

Table 6.11 Desk Study Conclusion

Receptor	Findings from Desk Study	Implication for Field Survey
Designated Sites	Several pNHAs occur within 15km of the site. However, there is no SPR chain for significant effect. These receptors can be excluded from assessment. No NHA's occur within 15km. European sites are to be assessed within the remedial AAsr.	None
Waterbodies	There is a SPR chain for effect to the Eany River System from the two Surface Water Pathways on site. Further assessment required.	Water quality sampling upstream and downstream of discharge points
Non-Volant Mammals	Records of non-vollant mammals exist within the 2km Grid Square of the development. Further field survey required.	Investigation of site to determine if (1) there is potential supporting habitat, and (2) if identified, dedicated survey of supporting habitat
Bats	Low-Moderate Bat Suitability. Records of two species within 2km Grid Square.	Investigation of site to determine if (1) there is potential supporting habitat, and (2) if identified, dedicated survey as per rational contained within NPWS and Bat Conservation Trust guidance ^{3, 4} .

³ Marnell, F., Kelleher, C. & Mullen, E. (2022) Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland

⁴ Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust

Receptor	Findings from Desk Study	Implication for Field Survey
Birds	Extensive records of bird species within 2km Grid Square	Onsite Bird survey to determine to what extent the site support bird species and if specific mitigation or avoidance is required.
Invertebrates	Extensive records of invertebrates. Threatened small heath butterfly record.	Potential habitat to be investigated during multi-disciplinary site walkover
Amphibian and Reptiles	Records of two amphibians.	Potential habitat to be investigated during multi-disciplinary site walkover
Invasive Species	Records of two invasive species of which one is known to be established on site, namely Himalayan Balsam	Full survey and management plan required.

6.6.2 Field Study

This section outlines the result of field study conducted.

6.6.2.1 Habitat Survey

The following habitats listed in Table 6.12 were recorded within the red line boundary. This includes the extraction site and the surrounding environments. All habitats were recorded during a Phase 1 habitat survey and classified according to Fossitt (2000).

Table 6.12: Habitats on Site and surrounding environs

Fossitt Code Key	
ED4	Active quarries and mines
ED3	Recolonising bare ground
ED2	Spoil and Bare Ground
WS1	Scrub
WS3	Non-native Shrub
GA1	Improved Grassland
GS4	Wet grassland
FL8	Other artificial lakes and ponds
FW4	Drainage ditches
WN6	Wet Willow Alder Ash Woodland
BL2	Earth Banks
BL3	Buildings

The habitats recorded are illustrated in Figure 6.3 with a legend of habitat details. A brief outline of the characteristics of habitats on site is provided in the remainder of this section. However, position and scale of habitats shown are approximate only and should be considered only as a broad representation of the study area.

Figure 6.3: Habitats within the red line boundary

Current land use for the application site is as a working quarry. Extraction and processing take part in the central part of the site on the quarry deck within the main quarry void. Large parts of previous quarry workings within the site are partially recolonised with pioneer vegetation, especially along the southern boundary.

ED4 Active quarry

Active Quarry is the dominant habitat type within the site. It can be broadly described as exposed rock faces and stockpiles of excavated material. The quarry void also contains standing water. As the quarry is active, no vegetation was noted within the void with areas of scrub noted around the ledges.

WS1 Scrub

This habitat was observed dispersed over the site, with areas dominant around the current quarry ledges. Scrub onsite predominantly consists of Gorse (*Ulex* spp.), Willows (*Salix* spp.), Bramble (*Rubus fruticosus* agg.) and Bracken (*Pteridium aquilinum*). Areas of non-native shrub have become established in several areas of scrub; the majority of non-native shrub on-site warrants classification as a distinct habitat of WS3 Non-Native / Ornamental Shrub

WS3 Non-Native / Ornamental Shrub

Himalayan knotweed (*Persicaria wallichii*) is the main invasive on site. It is well established and has completely dominated certain areas of the site. A sole occurrence of Giant Rhubarb (*Gunnera Tinctoria*) occurs at the north of the site as illustrated in Figure 6.3. Ongoing disturbance allows non-native invasive species to readily colonise new exposed areas of soil. There is an ongoing invasive species management plan which was devised in 2022 in place at the site. A patch of woodland has been replaced by this habitat at the northwestern boundary of the site. The woodland lost measures c. 0.08 ha.

ED2 Spoil and Bare Ground

Largely unvegetated piles of spoil and rubble. Transient in nature due to quarrying activities. Approximately 0.074 ha of woodland has been cleared in this area and it has generally been kept devoid of vegetation through the movement of vehicles and stockpiling of materials.

ED3 Recolonising Bare Ground

There are multiple areas of recolonising bare ground around the subject site, mainly to the north of the site within the previously worked areas. These areas are of no significant ecological value and will eventually be encroached by scrub, if left undisturbed. Species noted within these areas include Greater Plantain (*Plantago major*) Nettle (*Urtica dioica*), Dandelion (*Taraxacum* spp.), Willow-herbs (*Epilobium* spp.) and Ragworts (*Senecio* spp.)

BL2 Earth Banks

Colt's Foot (*Tussilago farfara*) and Charlock (*Sinapis arvensis*) occur frequently on the banks. Silverweed (*Potentilla anserina*), Yorkshire Fog (*Holcus lanatus*) Creeping Buttercup (*Ranunculus repens*) and occasional Himalayan Knotweed (*Persicaria wallichii*) occur.

GS4 Wet Grassland

This habitat was observed at the wood edge at the south of the site. The habitat occurs in slight mosaic with ED3 Recolonising Bare Ground. Yorkshire Fog (*Holcus lanatus*) is the dominant grass with occasional meadow grasses (*Poa* spp.). Rushes occur moderately. Marsh thistle (*Cirsium palustre*), Flag Iris, Fringed Willowherb, Silverweed and nettles all occur moderately.

WN6 Wet Willow Alder Ash Woodland

The roadside edge of the woodland comprises Gorse, Sycamore Willow, Hawthorn, Willowherb, and Vetch with a grassy verge of Bents, Meadow Grasses and Yorkshire Fog. Forbs including Knapweed, Creeping Buttercup, Dandelion, Bedstraw, and Oxeye Daisy. The woodland centre contains Willow, Alder, Ash. Occasional Birch Trees occur. The Woodland is well developed with canopy heights exceeding 10m in places. The edge approaching the active quarry is buffered by a drainage ditch. Species composition at this edge is comprised of Bracken, Bramble, Nettle, Yorkshire Fog, Bents, Iris, and Creeping Buttercup.

GA1 Improved Agricultural Grassland

This habitat occurs east of the active quarry. It is buffered from the quarry by a patch of recolonising bare ground likely resultant from stockpiling of excavated earth during expansion of the quarry area. Yorkshire fog (*Holcus lanatus*) and Perennial Rye Grass (*Lolium perenne*) are common grasses in this habitat. Forbs including daisy (*Bellis perennis*), dandelion (*Taraxacum* spp.) and white clover (*Trifolium repens*) are recorded as frequent.

FW4 Drainage Ditch

Outflow from settlement ponds follows drainage ditches. Vegetation composition within each ditch is variable. Typical marsh species occur in places, this includes flag iris, horsetails and common Bur Reed.

FL8 Artificial lakes and ponds

The site water management system involves two settlement ponds in the northern portion of the site. Settlement Pond 1 supports lower nutrient species. Common Bur Reed and a small fringe of rushes and bents occurs although vegetation here is minimal. Settlement Pond 2 exhibits slightly higher nutrient species. Evidence of disturbance has led to presence of species such as Foxglove and Himalayan Knotweed in the periphery.

Photograph 6.1: FW4 Drainage Ditch, GS4 Wet Grassland and WN6 Wood Edge**Photograph 6.2: ED4 Active Quarry, grading to WS1 Scrub and WS3 Non-native Shrub**

Photograph 6.3: BL2 Earth Banks, ED2 Spoil, ED3 Recolonising Ground and BL3 Buildings and Artificial Surfaces



Photograph 6.4: FL8 Settlement Pond



Photograph 6.5: WN6 Wood at the south of the site



Photograph 6.6: Remnant Willows at the northwest of the site in an area now occupied by WS3 and ED2



6.6.2.1.1 Historical habitats within the subject site

The predominant change in the proceeding years since 1995 has been the gradual removal of grassland at the east of the active quarry. This grassland was likely improved agricultural grassland. Quantifying the exact amount of habitat loss is difficult due to the differences in aerial imagery from different time periods, and other factors including resolution of data and angle of imagery. It is estimated that c.0.6ha of improved agricultural grassland were lost between 1995 and 2024 as a result of continued quarry operation.

Additional changes in habitat composition of the site have occurred. Woodland measuring c.0.2ha at the northwest of the site has been lost. Examining aerial imagery this loss has occurred in the last 10 years. The woodland was likely a semi native wood of willow alder ash birch hawthorn and shrub species.

Woodland at the south of the site has increased slightly in extent in the last 30 years. Examining historical aerial imagery from c.1995/96 the woodland at the south of the site has increased in extent from c.0.26 hectares to c. 0.37ha. This represents a slight positive effect. However, it is important to note that the development has been transient in nature and there could have been periods where the extent of the wood was reduced. Nonetheless, examining a series of aerial imagery from 1995 to present day does reveal that this woodland has gradually increased in extent.

Figure 6.4 presents an aerial image of the quarry from 1995/96 with the current site boundary overlayed.

Figure 6.4: Subject site c. 1995/96



Geohive.ie ©Tailte Eireann

Land use as a quarry is historical with annotation referring to a quarry are visible on historic 6-inch maps. The surveying for these maps was conducted between 1892 to 1834. The quarry extent was minimal when compared to its current extent. Analysis of historical imagery shows that the original quarry as displayed on the first edition six-inch maps from Tailte Eireann has gradually increased in extent in the intervening period until official cataloguing of aerial imagery began c.1995. A further increase of c.0.6ha has occurred between 1995 and 2024.

6.6.2.2 Mammal Survey

6.6.2.2.1 Badger

There were no badger setts observed in the quarry site. There was no evidence of badger feeding, tracks or other signs onsite. The scrub habitat on-site is generally perched on quarried faces. The woodland understorey is on steep gradient and not potential sett habitat.

6.6.2.2.2 Other Mammal Evidence/Activity

There was no other tracks, signs or evidence of other non-volant mammals onsite. This includes deer, red and grey squirrel, fox and pine marten.

6.6.2.3 Bats

An inspection of potential bat supporting structures was conducted on site. This was informed by the roost preferences of species that have moderate to high affinity to features within the landscape of the development in combination with existing records of species with the 2km grid square of the development. Table 6.13 outlines the assessment for roost potential at the development site for bat species. BSI refers to the landscape suitability index for the species.

Table 6.13: Bat Roost and Foraging/Flight Path Potential Assessment

Species	BSI	Roost Requirements	Potential Roost Feature Present
<i>Pipistrellus pipistrellus</i> , <i>P. pygmaeus</i>	36/44	Maternity roosts in buildings, out of site in crevices, Male roosts in trees or buildings	No, the structures on site are small, transient, and do not offer suitable habitat. The structures on site are fragile and would not offer adequate support for roosting pipistrelles. The majority of trees are willow and ash. Inspection of mature trees did not reveal suitable prfs such as crevices, or woodpecker holes. The high level of anthropogenic activity on site likely discourages any potential roosts. There is low to negligible roost potential for this species based on the extent and nature of potential roost features on site
<i>Plecotus auritus</i>	33	Maternity roosts in trees, large voids in buildings and bat boxes. Commonly use wooden roof truss beams. High roost fidelity	No, the structures on site are small, transient, and do not offer suitable habitat. The species prefers roosts in houses and similar structures. No such structures are present on site

Species	BSI	Roost Requirements	Potential Roost Feature Present
			<p>The majority of trees are willow and ash. Inspection of mature trees did not reveal suitable crevices, or woodpecker holes.</p> <p>The high level of anthropogenic activity on site likely discourages any potential roosts.</p> <p>There is low to negligible roost potential for this species based on the extent and nature of potential roost features on site</p>
<i>Nyctalus leisleri</i>	35	Trees, bat boxes, gable end of lofts, disused chimneys	No suitable built features. Inspection of trees did not reveal suitable roost features
<i>Myotis daubentonii</i>	43	Hollows in trees, bridges or building, preference for oak trees.	There is low to negligible roost potential for these species based on the extent and nature of potential roost features on site
<i>Myotis nattereri</i>	38	Tree holes, attics, bridges.	
Foraging /Flight Path Assessment			
Species	BSI	Foraging / Flight Path Preference	Potential on Development Site
<i>Pipistrellus pipistrellus</i> , <i>P. pygmaeus</i>	36/44	Woodland and Riparian Habitat	The semi native woodland at the south of the site provides good connectivity to the wider landscape. This habitat is assigned moderate suitability in terms of provision of flight paths and foraging habitat. This habitat and the potential provision of support to bat species warrants assignment as KER for this assessment.
<i>Plecotus auritus</i>	33	Hedgerows and Native Woodland, strong preference for deciduous.	
<i>Nyctalus leisleri</i>	35	Woodland Edge, Scrub Pasture, drainage Channels, less preference for improved grassland	
<i>Myotis daubentonii</i>	43	Riparian habitat, Woodland, arable and rough grassland	
<i>Myotis nattereri</i>	38	Woodland, riparian woodland, ponds, pasture	

Examination of potential roosts features on site found that there is negligible to low potential that there are roost supporting features on site. There are 3no. enclosed galvanised stell/tin canopies covering machinery none of which exhibited signs of roosts. There were no obvious

crevices in the rock face that could support bats. The rock face is continuously disturbed further lowering the suitability of this feature. Trees on-site did not exhibit any potential roost features. The potential of roosting bats on sites can be excluded. This would warrant assignment as negligible bat roost potential on site. This is referenced by the criteria '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' ⁴.

In terms of foraging habitat /flight path the semi native woodland at the south of the site provides good connectivity to the wider landscape. This habitat is assigned moderate suitability in terms of provision of flight paths and foraging habitat. This habitat and the potential provision of support to bat species warrants assignment as KER for this assessment.

6.6.2.4 Bird Survey

Bird observation reports were conducted over a two-month period, encompassing the entire footprint of the quarry site. Detailed results of these observations are shown in Appendix 1. The site boundaries and settlement ponds recorded the most bird activity. The site boundaries of scrub vegetation provide good cover, foraging and habitat connectivity. Several species of bird were recorded during the survey including:

- | | | |
|---------------|-----------------|----------------|
| • Jackdaw | • Blue tit | • Pied wagtail |
| • Rook | • Great tit | • Siskin |
| • Robin | • Dunnock | • Stonechat |
| • Song thrush | • Meadow pipit | • Wren |
| • Wren | • Collared dove | |

No protected bird species were noted during any of the site visits undertaken. Although foraging meadow pipit were noted. This species is red listed on the birds of conservation concern list and is therefore considered a KER.

6.6.2.5 Other Faunal Activity

The drainage ditches and settlement ponds on site supported abundant invertebrate species. No suitable habitat on-site such as well drained grassland occurs to support the small heath butterfly, which is recorded in the 2km grid square of the development.

Survey time was not ideal for amphibians. Drainage ditches particularly to the south of the site could support amphibians although none were noted during walkovers. Maintenance of these wetland areas should occur moving forward.

6.6.3 Identification of Key Ecological Receptors

Table 6.14 lists all identified receptors and assigns them an ecological importance in accordance with the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009). This table also provides the rationale for this determination and identifies the habitats that are Key Ecological Receptors. These ecological receptors are considered in Section 6.7 of this report and remedial mitigation measures in place and proposed future measures will be incorporated where required, to avoid potential significant impacts on the features.

Table 6.14 Identification of KERs

Ecological Feature / Species	Reason for Consideration as KER	KER Yes/No
Designated Sites	Nationally Designated Sites No pNHA or NHAs are within the zone of likely impact or are connected to the site via a SPR Chain for significant effect.	No
	International/European Sites The rAAsr examined the impact the development has had on European Sites. A finding of no significant effects was made based on the nature scale and extent of both the proposed development and any pathways for effect	
Aquatic Habitats and Species	The Eany Water System is assigned local importance (Higher value) . The Eany Water system provides important connectivity to the wider landscape supports semi-natural vegetation assemblages and supports freshwater species	Yes
	Drainage ditches/Artificial ponds This habitat has been assigned local importance (lower value)	No
Built/Man Made Habitats	Active quarries and mines This habitat has been assigned local importance (lower value)	No
	Recolonising bare ground. This habitat has been assigned local importance (lower value)	No
	Buildings and artificial surfaces This habitat has been assigned local importance (lower value)	No
Scrub	This habitat has been assigned local importance (lower value)	No
Woodland	This habitat is assigned local importance (higher value) due to its species composition, connection to the wider landscape and foraging provision to faunal species.	Yes
Grassland	This habitat has been assigned local importance (lower value)	No
Bat	Bat presence was not identified during any walkover surveys and there is negligible potential for habitat to support roosting bats. Foraging/ Flight path provision may occur. The woodland at the south of the site was assessed as moderate suitability for foraging/ flight path provision. The habitat that may provide support to bats is assigned local importance (higher value)	Yes
Badger	Badger presence was not identified during survey and site investigation. This species is not a KER as its presence was not observed during site investigation and there is no evidence of badgers within the site	No
Otter	Otter presence was not identified on site. Both the drainage ditch and adjacent stream are too narrow and shallow to support the needs of otters	No
Deer/Squirrel/Other Mammals	No evidence of these mammal species was observed on site. These species are not a KER as its presence was not observed during site investigation	No

Ecological Feature / Species	Reason for Consideration as KER	KER Yes/No
Birds and bird habitat	Bird species occurring on site and the habitats including the ponds are assigned Local Importance (Higher Value) , these are considered a KER.	Yes
Amphibians/Reptiles	Amphibian and reptile presence was not identified on site and therefore not considered a KER.	No

6.7 Ecological Impact Assessment

6.7.1 Do Nothing Scenario

If development ceased, the main portion of the quarry would be colonised by pioneer species. The established infestation of Himalayan knotweed would readily colonise disturbed areas and the extent of infestation would grow. Over time, weeds and grasses would turn to scrub and woodland in patches of the site. The quarry void by its nature would not completely fill with water, instead there would be several small surface water fed lagoons that would develop.

6.7.2 Effects on Designated Sites

There is no SPR chain for significant effect on any Natural Heritage Area or Proposed Natural Heritage Area. The rAAsr found that the development has had no significant impact on any European Site.

6.7.3 Potential Invasive Species Threat

The development contains an infestation of Himalayan Knotweed, and one sole Giant Rhubarb plant, an attempt at Invasive Species management has been made by the applicant. This application is accompanied by an Invasive Alien Species Management Plan (IASMP) attached as Appendix II. The control of invasive alien species will follow guidelines issued by the National Roads Authority - The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (NRA 2010). The continued control of the infestation will ensure it does not spread beyond the site and affect any sensitive ecological receptors. Assessing the impact of the development with regard to invasive, it can be concluded that the activities have allowed an infestation of Himalayan Knotweed to establish. This infestation is contained within the site and has not conveyed negative effects to any sensitive ecological receptors. Management is ongoing with the aim of total eradication.

6.7.4 Likely Significant Effects

This section examines the likely significant effects on KERs from the development during the site clearance works and entire construction stage and operational stage to date. Where likely significant effects are predicted to have occurred, remedial mitigation in place and appropriate mitigation measures going forward will be suggested to avoid/reduce the significance of the effect on KERs.

Assessment of Effects on Rivers/Streams and Sensitive Aquatic Faunal Species

Description of effect	This assessment considers the Eany Water River System. Chapter 8: <i>Water</i> , outlines a series of analysis of the effects the development has had on receiving.
Characterisation of unmitigated effect	Temporary fluxes in received sediment/ pollutants.
Assessment of significance prior to mitigation	Slight negative
Mitigation Measures (Implemented and Proposed)	<ul style="list-style-type: none"> A water management system has been in operation at the quarry providing attenuation prior to surface water discharge. A new proposed upgraded water management system is to be put in place as detailed in Chapter 8.

Residual effect	No residual effect on this KER exists. Analysis of water quality suggest that the development has not conveyed a significant effect on water quality. Data is indicative that agricultural fertiliser is a pressure on water quality in this catchment.
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Assessment of potential effects on Woodland

Description of effects	<p>c.0.37 ha of semi natural wet willow alder ash woodland occurs at the south of the site. This wood provides good connectivity to the wider landscape and could offer support to bird and bat species. This woodland has increased in extent in the last 30 years.</p> <p>C. 0.2ha of wet willow wood has been lost at the northwest of the site. This has been replaced by habitat of low importance and has been infested with invasive species.</p>
Characterisation of unmitigated effect	<p>Woodland extent increase during operation has been a slight positive effect.</p> <p>Removal of Woodland during the operation of the development has been a reversible moderate negative.</p>
Assessment of significance prior to mitigation	Slight Positive for increase of southern wood, moderate negative for loss of northwestern wood
Mitigation	<ul style="list-style-type: none"> • Retain woodland moving forward • Implement sensitive planting of native willow alder ash and birch to further improve landscape connectivity. • Control INNS onsite to allow woodland regeneration at the Northern boundary
Residual effect	<p>Examining historical aerial imagery from c.1995/96 the woodland at the south of the site has increased in extent from c.0.26 hectares. This represents a slight positive effect. However, it is important to note that the development has been transient in nature and there could have been periods where the extent of the wood was reduced. Nonetheless examining a series of aerial imagery from 1995 to present day does reveal that this woodland has gradually increased in extent.</p> <p>The loss of wet willow wood at the northwest of the site measuring c.0.2ha in extent represents a moderate negative residual effect due to the impact this has on connectivity with the landscape at the northern boundary. Treating the INNS that have established here as per the management plan and subsequent replanting of Willow, Hawthorn, Birch, will remediate this effect and after implementation have a slight positive effect on woodland and its connectivity with the wider landscape.</p>

Assessment of Potential Effects on Fauna

The table below mainly focuses on the potential impacts from noise from the construction and operational works which could cause a disturbance to any birds/mammals which may be nesting/foraging within site.

Assessment of Effects on Birds of Conservation Concern

Description of Effects	<p>Noise from the operational works could have caused a disturbance to any birds foraging on site. Several common species were observed during surveys. Foraging resource is provided by berries from species such as hawthorn, and invertebrates present in exposed soil or at the wetlands on site.</p> <p>Removal of woodland at the northwest could have removed foraging/roosting resource.</p> <p>Increase of woodland at the south has slightly increased foraging habitat provision</p>
Characterisation of unmitigated Effect	<p>The effect is characterised as short-term negative.</p> <p>The loss of woodland is characterised as reversible-medium term negative</p> <p>The increase in woodland is characterised as medium-term positive</p>
Assessment of significance prior to mitigation	<p>Prior to mitigation disturbance considered slightly negative</p> <p>Loss of woodland is considered moderately negative</p> <p>Increase of woodland is considered slight positive</p>
Mitigation	<ul style="list-style-type: none"> Recorded noise levels from quarrying activity have been measured at a level well below typical guideline limit values. Plant used at the site must continue to have noise emission levels that comply with the limiting levels defined in EC Directive 86/662/EEC and any subsequent amendments. Any plant that is used intermittently must be shut down when not in use to minimise noise levels. All extraction and processing activities must continue to follow the guidelines as set within BS 5228 -1:2009+A1 2014. This includes guidance on several aspects of construction site practices, which include, but are not limited to: (a) Selection of quiet plant, (b) Control of noise sources, (c) Screening, (d) Hours of work. The best means practical, including proper maintenance of plant, must continue to be employed to minimise the noise produced by on-site operations. All vehicles and mechanical plant must be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract. Compressors must be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which must be kept closed whenever the machines are in use and all ancillary pneumatic tools must be fitted with suitable silencers. All motors and pulleys must be maintained to a high standard with regular maintenance so as to avoid any tonal or impulsive components in the emission. Proper management procedures (pre-blasting management procedures, loading management procedures and blasting

	<p>management procedures) must be implemented and in place at all times moving forward.</p> <ul style="list-style-type: none"> • Woodland is to be reinstated at the northwest of the site after eradication of INNS. • Woodland at the south is to be retained
Residual Effect	<p>No residual effects are envisaged after the implementation of mitigation on this KER in relation to disturbance.</p> <p>There will be a slight positive residual effect after remedial mitigation in the form of woodland restoration at the Northwest of the site and removal of INNS.</p>

Assessment of effects on Bats and supporting habitat

Description of Effects	<p>Disturbance of foraging bats through noise and light, and alterations to species behaviour through changes in the landscape.</p> <p>Removal of foraging resource</p>
Characterisation of unmitigated Effect	The effect is characterised as medium-term negative.
Assessment of significance prior to mitigation	Prior to mitigation this effect is considered significant
Mitigation	<ul style="list-style-type: none"> • The series of noise mitigation and monitoring that was outlined in the previous table and indeed within chapter 9 applies here in mitigating any impact on foraging / commuting bat species • Retain all woodland. • Retain all linear boundaries to the site • Promote Natural wetland at woodland edge • Avoid operation outside standard hours • Reinstate woodland to the northwest of site • Remove all INNS
Residual effect	<p>No residual effects have occurred. The extent of supporting habitat has increased in the last 30 years. Moving forward it is proposed to further improve the connectivity of habitat on site, and to maintain natural wetlands which should aid foraging for any bat species. Working hours have followed the standard working day thereby limiting nighttime disturbance. There is no nighttime lighting associated with the development.</p>

6.7.5 Likely Significant Effects During Decommissioning Stage

No likely significant effects are envisaged during the decommissioning of the existing development. There will be no additional habitat loss during decommissioning. The quarry void will be allowed to rewild, and enhancement measures will be implemented as appropriate. Chapter 15, *Landscape & Restoration*, details a restoration plan to be implemented in the case of decommissioning of the entire quarry and/or the current extraction area.

6.7.6 Transboundary Effects

There are no transboundary considerations. The site is c.20km from the border with Northern Ireland, there is no pathway for transboundary effect.

6.8 Cumulative Impact Assessment

The existing development was considered in combination with other plans and projects in the area that could result in cumulative impacts on the Key Ecological Receptors (KERs). Records from Donegal County Council planning registry, and the EIA portal, were considered to identify projects that had potential to generate cumulative impacts on KERS. An area of interest of approximately 2km was used, however in cases where a common SPR chain for effect exists between other projects and this project the area of interest was extended.

Plans/Project that are completed or pending decision are included in the assessment. Unauthorized developments will be referenced but as there is no documentary evidence of their operation it is not possible to fully assess cumulatively.

The following plans/projects have been considered:

- N56 road upgrade: This has had no effect on biodiversity within the site. A small patch of dry humid acid grassland has been fragmented between the old road bordering the site and the new road. The operation of the quarry has not combined with the N56 upgrades to culminate in negative effects on ecological receptors of importance greater than local (lower).
- Continued Aquaculture at Inver Bay: The development site discharges water to a pathway that leads to Inver Bay. Water analysis and water management on site has ensured that water emanating from site has been of acceptable quality. No aspect of this development is likely to combine with the aquaculture activities at Inver Bay to culminate in effect on marine ecological receptors.
- A series of unregulated quarries within the vicinity of the development site: There are several small-scale quarries within the general area of the development. These quarries are in a different surface water catchment to the development detailed in this report. There is no documentary evidence on the operation of these quarries, and they therefore cannot be properly assessed. However, it is unlikely that these quarries combined with the proposed development to culminate in negative effects on any ecological receptor of significance.
- The main plans that dictate development policy in Co. Donegal are the County Development Plan 2018-2024, and draft Development Plan 2024- 2030. The Development plan will aim to implement proper rural planning through stricter controls on rural one development. This will benefit local ecological receptors in ensuring connectivity across the landscape and avoiding further fragmentation.

6.9 Conclusion

This ecological impact assessment concludes that historic expansion of quarry activities within the subject site have had no significant residual effects on any key ecological receptor (KER's). Key ecological receptors comprised receptors of local importance (higher value) or above. KER's included the Eany Water River, Meadow Pipit who utilise scrub and wood for foraging, Bats who could potentially use the native wood for foraging and flight paths, and Wet Willow Alder Ash Woodland. The impacts continued operation of the quarry has had on these receptors was examined. No residual impact on any KER remains after the implementation of remedial mitigation. The primary remedial mitigation required is the removal of Himalayan Knotweed from the site and the re-instatement of semi-natural wet willow woodland at the northwest of the site. No significant cumulative or transboundary effects were found in the course of this assessment.

APPENDIX I: Bird Survey

Site Name:	Murray Stone
Date: Start time: End time:	21/05/2024 09.30 12.30
Counter: Weather: Activity:	DF Cloud cover: 33-66%, Rain: 0, Wind: 2, Visibility: 1. No other activity onsite.

Species	By sight			By sound
	In flight	Foraging	Roosting	
Blackbird				2
Blue tit		1		
Coal tit	1			
Wood pigeon	4			
Goldfinch		1		1
Great tit	1			
Hooded crow	1	2		
Jackdaw			1	2
Long tailed tit		1		
Meadow pipit		1		3
Collared dove	2			
Pied wagtail	1	2		2
Robin		1		3

Site Name:	Murray Stone
Date: Start time: End time:	04/06/2024 10.00 14.00
Counter: Weather: Activity:	DF Cloud cover: 66-100%, Rain: 3, Wind: 2, Visibility: 2. No other activity onsite.

Species	By sight			By sound
	In flight	Foraging	Roosting	
Jackdaw	1		1	
Common Whitethroat		3		
Hooded crow	2	2		
Blue tit				1
Bull Finch		1		
Blackbird				1
Robin		1		
Song thrush	1			2
Stonechat		2		
Wren				8

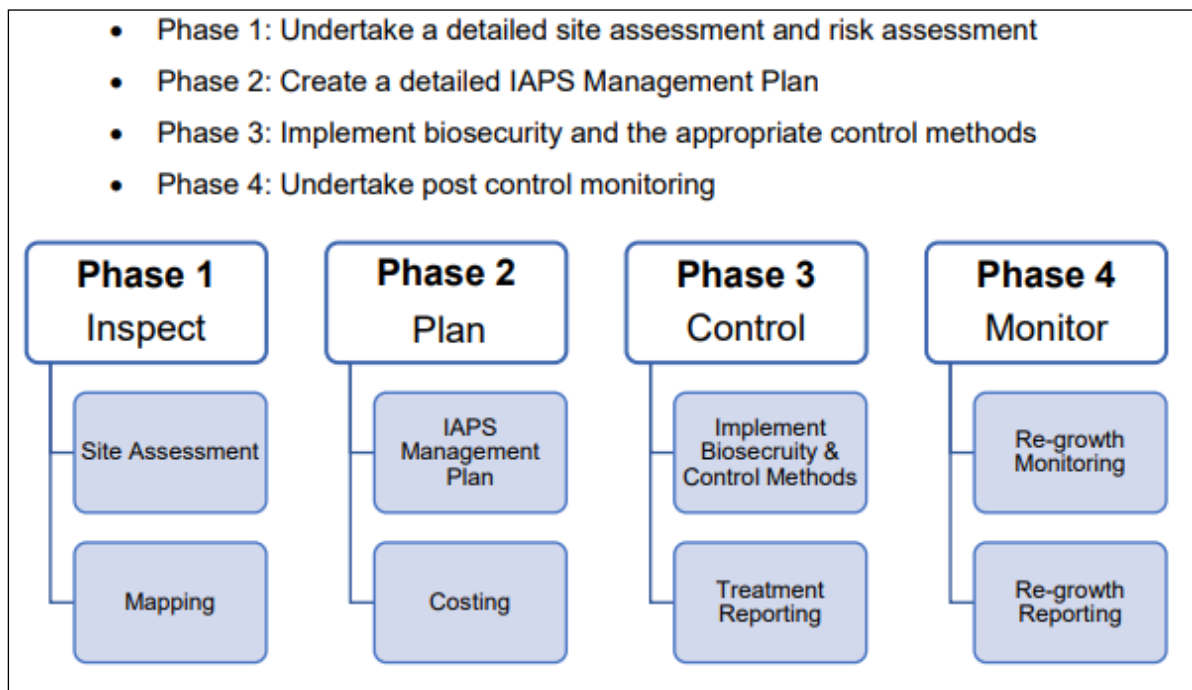
Appendix II: Invasive Species Management Plan

Introduction

Himalayan Knotweed has become established on site. This third schedule Invasive Species is robust and has formed dense thickets. One sole instance of Giant Rhubarb has become established onsite.

Eradication by the applicant is an obligation under European Communities (Birds and Natural Habitats) Regulations, 2011– 2015 and must be done in a manner that does not encourage the species to spread. Guidance on removal of this species is provided by the document The Management of Invasive Alien Plant Species on National Roads – Technical Guidance (GE-ENV-01105). Guidance document GE-ENV-01104 outlines the steps to a control program, this is illustrated in Figure 1.

Figure 1: Phases of Invasive Species Control



Extent of Infestation

Photograph 1 illustrate the Himalayan Knotweed Infestation on-site. Photograph 2 provides a drone image overview of the main infestation. Figure 2 illustrates the spatial extent of infestation overlain on drone imagery, also shown via point is the location of the sole giant rhubarb.





Control Programme

- Areas infested with Invasives as illustrated in Figure 2 must be clearly identified and the specific sites of infestation isolated with fencing or warning tape.
- 'Biosecure zone' signs must be erected at each contaminated site to alert workers that INNS are present and to avoid entering or interfering with these sites.
- Likewise, any stockpiles of soil that are or could be contaminated with INNS must be clearly marked.
- Designated and clearly marked cleaning and/or disinfection stations should be strategically placed within the work site for use by staff, vehicles and machinery.
- Where it is necessary to work in contaminated areas, every effort should be made not to use vehicles with caterpillar tracks.
- All vehicles and equipment that have been used in INNS control operations must be thoroughly pressure-washed in a designated wash-down area each time they leave the works site and once work in that area has been completed. This also includes footwear, personal protective equipment (PPE), tools, and other light equipment. It is important to remove soil that may contain seeds or plant fragments, which otherwise could be transported along the road corridor as works are being undertaken.
- Vehicles leaving contaminated area(s) should either be confined to marked haulage routes protected by root barrier membranes or be pressure-washed before leaving the area. Only vehicles that are deemed to be biosecure (i.e. sealed so that no soil can escape) shall be used to transport contaminated soil and all must be thoroughly pressure-washed in the designated washdown area before exiting the infested area.
- The following conditions are to be adhered to (Extracted from GE-ENV-01105) A suitably qualified ecologist or horticulturalist with sufficient training, experience and knowledge in the control of INNS should be employed to assist in the planning and execution of control measures in relation to Himalayan knotweed. In addition, those involved in the control of Himalayan knotweed may be advised to have access to the advice of a

Registered Pesticide Advisor on the register established by the Minister for Agriculture, Food and the Marine pursuant to Regulation 4 of the Sustainable Use of Pesticides Regulations.

- All pesticide users must be registered and have the appropriate training necessary to carry out the proposed method of control. Similar to Japanese knotweed, Himalayan knotweed is most often spread by rhizomes and eradication of this species is equally as difficult.
- The infestation is to be treated with a non-persistent herbicide. Physical removal shall be conducted at the site in the areas mapped (Figure 2). This includes cutting, digging or excavating, hoeing and pulling by hand. Extra care shall be taken near watercourses as water is an effective conduit for the dispersal of plant fragments and seeds.
- Once removed, the plant material is to be buried to a minimum depth of 5m in uncontaminated soil. A geotextile membrane that is in new condition, sealed, UV protected, and has an associated manufacture guarantee for 50 years of efficacy is to line the burial chamber. All control measures must comply with best practice legislation and all planning conditions.
- For the sole giant rhubarb onsite application of herbicide late in the growing season i.e august to September to cuts made on stalks or stems is most effective. Follow up control for 2 -3 consecutive growing seasons is required. Any regrowth should be monitored and treated likewise.

Monitoring

Those responsible for the treatment of INNS must document the methods of treatment employed. Following control of large areas of INNS, subsequent disturbance of the soil may give rise to a flush of seedling germination or revitalised rhizome growth. To avoid this, bare soil should be mulched (covered with a natural or synthetic barrier, such as wood chip, straw, geotextile, or other appropriate material) and planted at the earliest opportunity with appropriate native replacement vegetation to stabilize the soil and deter subsequent re-invasion. The site must be monitored for a period of two years, if regrowth is noticed re-treatment must take place.

Conclusion

The measures outlined in this IMP will ensure that the existing infestation of INNS is removed from the site.

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Guidelines for assessment of Ecological Impacts of National Road Schemes, (NRA, 2009). Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2009).

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