Remedial Ecological Impact Assessment (rEclA)

Substitute Consent Application: Concrete Manufacturing Facility & Quarrying Activities, Tromman Quarry, Co. Meath

Woodrow APEM Group
Upper Offices,
Ballisodare Centre,
Station Road,
Ballisodare,
Co. Sligo,
F91 PE04,
Ireland.

Tel: + 353 71 914 0542
Email: info@woodrow.ie

February 2024

DOCUMENT CONTROL

Document	Remedial Ecological Impact Assessment (rEcIA) – Substitute Consent Application: Concrete Manufacturing Facility & Quarrying Activities, Tromman Quarry, Co. Meath
Client	Quarryplan Ltd. (on behalf of Keegan Quarries Ltd.)
Prepared by	Woodrow APEM Group, Upper Offices, Ballisodare Centre, Station Road, Ballisodare, Co. Sligo, Ireland. F91PE04 T: 353 (0)719140542
Lead Author	James O'Connor (with assistance from Louise Gannon)
Checked internally	Mike Trewby
Checked by client	CST 25/01/2024
Status / Version	Final (for client issue) – V01 – 12/02/2024

STATEMENT OF AUTHORITY

Woodrow APEM Group (hereafter known as Woodrow) is an established and accomplished environmental consultancy committed to delivering robust ecological assessment services for clients in the private and public sectors. Woodrow provides an in-house team of ecologists and environmental professionals whose primary specialisms include botany, habitats, birds, bats, mammals, invertebrates and aquatic ecology. Woodrow's investment in high-technology field equipment and software, and the use of Survey123 forms throughout all survey types ensures reliability and confidence in our work. Woodrow staff are fully conversant with wildlife legislation in both Ireland and the UK, and work to exacting standards, according to established guidelines issued by the Chartered Institute of Ecology and Environmental Management (CIEEM).

This report has been authored by James O'Connor with assistance from Louise Gannon.

James O'Connor is an Ecologist with Woodrow, who has a PhD in aquatic sciences and a primary technical specialism in freshwater ecology. James has prior experience in monitoring wild bird populations with Birdwatch Ireland and is heavily involved in ornithological work as part of his role with Woodrow. Here, he regularly carries out mammal surveys and also performs a supporting role as Ecological Clerk of Works (ECoW). James is first author on several peer-reviewed academic research papers and has helped draft reports to disseminate key research findings to state agencies such as the Irish Environmental Protection Agency (EPA) as well as Irish county councils.

Louise Gannon is an Assistant Ecologist with Woodrow. Louise has completed a B.Sc. in Environmental Science. Her main experience lies in carrying out protected species surveys for bats (preliminary roost assessments, emergence/re-entry survey and activity transect surveys) as well as the deployment of static bat detectors and reporting on the same. She also carries out bat call analysis using Kaleidoscope and BatExplorer, the analysis software used to assess bat calls and activity. She also has experience in carrying out otter, badger and red squirrel surveys. Louise is a licenced bat surveyor (DER/BAT 2023-25) and a Qualifying member of CIEEM.

This report has been reviewed and approved by Mike Trewby, Associate Director with Woodrow. Mike is the company's lead ornithologist and field work manager. Mike worked for Birdwatch Ireland from 2003 to 2010 conducting research on red-billed chough, red grouse and breeding seabirds. Prior to joining Woodrow in 2016, Mike worked as an independent

ornithological consultant and has over 20 years fieldwork and research experience in the field of ecology. Mike regularly undertakes impact assessments for large scale developments and is a full member of CIEEM.

QUALIFICATIONS:

James O'Connor – Qualifications:

B.Sc. – Agriculture and Environmental Management, ATU Galway, 2013.
M.Sc. – Applied Environmental Science, University College Dublin, 2015.
PhD – Aquatic Sciences, ATU Galway, 2021.

Louise Gannon – Qualifications:

B.Sc. – Environmental Science, ATU Sligo, 2021.

Mike Trewby – Qualifications:

B.Sc. – Zoology & Botany, University of Namibia, 1997.
PGDip – Environmental Studies, University of Strathclyde, 2002.

Table of Contents

1 INTRODUCTION

1.1 Background

Woodrow was requested to compile the remedial Ecological Impact Assessment (rEcIA) report on behalf of Quarryplan Ltd. and their client Keegan Quarries Ltd. This report presents the comprehensive ecological assessment essential for informing the development of the Remedial Environmental Impact Assessment Report (rEIAR). The rEIAR accompanies the planning application submitted to An Board Pleanála (the board) for substitute consent (SC), for the erection of the unauthorised structures in the concrete products manufacturing area of the site (i.e. northern area) in 2013 and unauthorised quarrying operations post 05 August 2018 at Tromman Quarry, Co. Meath.

1.2 Site Location

The Tromman Quarry Site consisting of the existing Quarry void and associated pre-cast concrete manufacturing facility (totalling 22.5 ha), is located in the townland of Tromman, Rathmolyon, Co. Meath. The site is situated *c*. 2.2 km north-west of Rathmolyon Village and some 6.4 km south of Trim. The site is bounded to the west by Kilsaran's Tromman Quarry, to the south by the regional road R156 and to the north and east by agricultural fields. The location of the quarry site in relation to the wider landscape is presented in **Figure 1.**

1.3 Purpose of Ecological Impact Assessment

The rEcIA can be considered as having three main purposes:

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

1.4 Legislative and Policy Context

A number of pieces of national and international legislation and policy are applicable to developments in Ireland that have the potential to impact on Ecological Features. Background information on the typical environmental legislation pertaining to such development is provided in the accompanying EcIA (Woodrow, 2023a). Briefly, this includes the following:

1.4.1 Legislation

- EU Habitats Directive 92/43/EEC, European Communities (Natural Habitats) Regulations 1997, European Communities (Birds and Natural Habitats) Regulations 2011;
- EU Birds Directive 79/409/EEC;
- Bern and Bonn Convention;
- EU Water Framework Directive 2000/60/EC;
- United Nations (UN) Convention on Biological Diversity (CBD);
- The Wildlife Act (1976) and amendments;

- Planning and Development Act 2000, as amended;
- Flora (Protection) Orders (FPO), 2015 and 2022;
- The European Communities (EC) Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009);
- The European Communities (EC) (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293 of 1988);
- EU Environmental Objectives (Freshwater Pearl Mussel) (Amendment) Regulations 2009 to 2018.

1.4.2 Policies and plans

The following plans and polices were also reviewed:

- Meath County Development Plans 2013-2019 and 2021-2027;
- National Biodiversity Action Plan (NBAP) 2017-2021 (to be superseded by the 4th National NBAP 2023-2027);
- River Basin Management Plan (RBMP) for Ireland 2018-2021 (to be superseded by the 3rd cycle RBMP 2022-2027);
- All-Ireland Pollinator Plans 2015-2020 and 2021-2025;
- All-Ireland Species Action Plan – Bats.

1.4.3 Guidance and sources of information

The assessment had regard to the following guidance documents and sources of information:

- CIEEM (2018, updated 2022). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management (CIEEM);
- NRA (2009a). Guidelines for the Assessment of Ecological Impacts of National Road Schemes (Rev 2). National Roads Authority, Dublin;
- EPA (2017). Revised Guidelines on the Information to be Contained in Environmental Impact Statements. Draft Report August 2017. Environmental Protection Agency, Dublin;
- OSi Mapping[1];
- Google Earth Pro
- Google Maps[2]
- Environmental Protection Agency (EPA) Maps[3];
- National Parks and Wildlife Services Online Map Viewer[4];
- National Biodiversity Data Centre – Biodiversity Maps[5];
- NRA (2009b). Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (Rev 2). National Roads Authority, Dublin.

[1] OSI Mapping. Available at: https://webapps.geohive.ie/mapviewer/index.html [Accessed August 2023].

[2] Google Maps. Available at: https://www.google.ie/maps/ [Accessed August 2023].

[3] EPA Maps. Available at: https://gis.epa.ie/EPAMaps/ [Accessed August 2023].

[4] NPWS Designations Viewer. Available at: https://dahg.maps.arcgis.com/apps/webappviewer/ [Accessed August 2023).

[5] National Biodiversity Data Centre – Biodiversity Maps. Available at: https://maps.biodiversityireland.ie/ [Accessed August 2023].

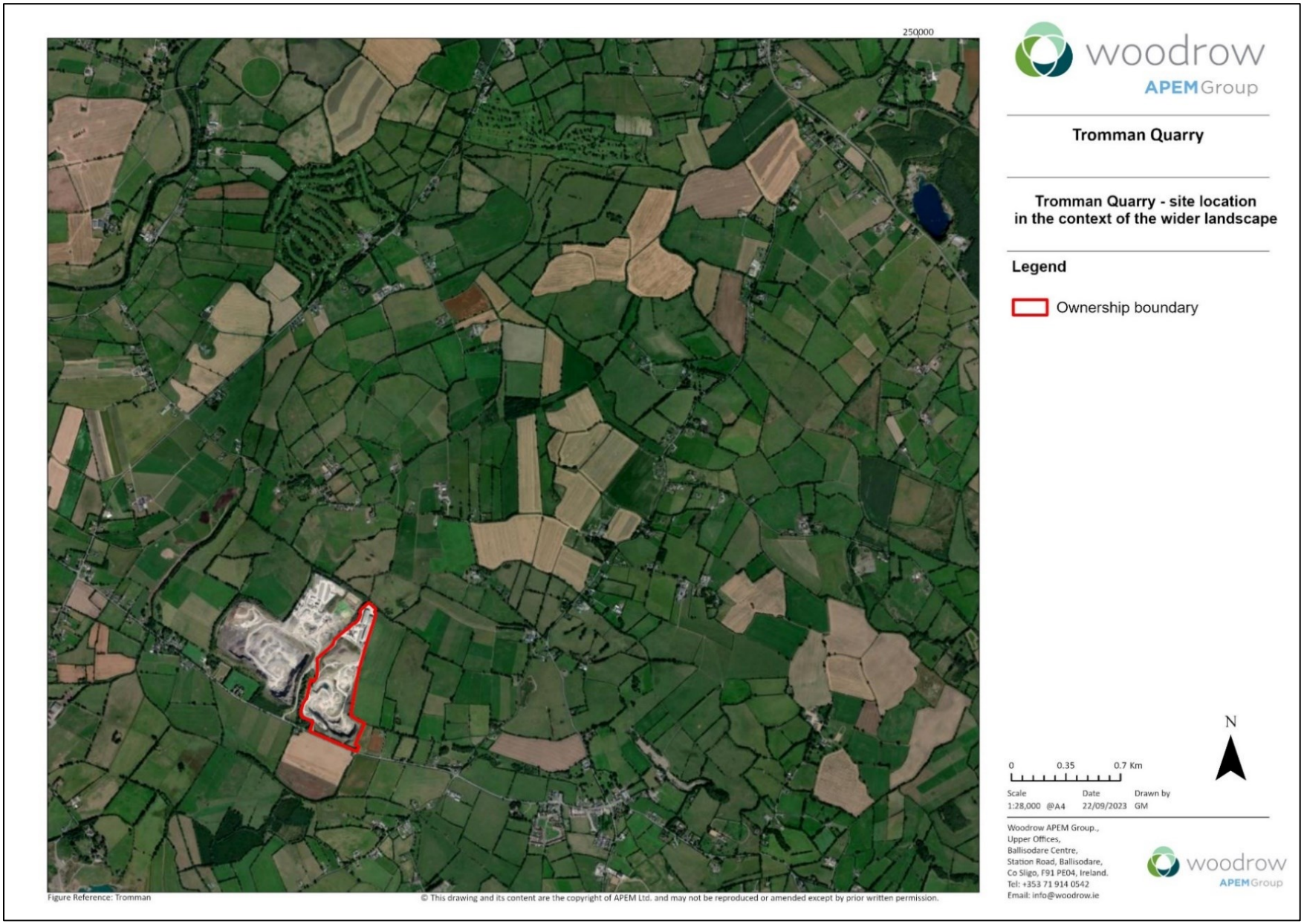


Figure 1. Site location in the context of the wider landscape.

2 IMPACT ASSESSMENT METHODOLOGY

Due to the requirement for a rEIAR in this instance, undertaking the Ecological Impact Assessment (EcIA) in a remedial format is slightly more complex; however, the following list provides a useful summary of the process for undertaking an EcIA, as detailed in CIEEM (2018, updated 2022), which has been adapted for remedial purposes.

Task	Description
➢ Scoping	• Determining the matters to be addressed in the EcIA, including consultation to ensure the most effective input to defining the scope.
➢ Establishing the baseline	• Collecting information and describing the ecological conditions in the absence of the proposed project, to inform the assessment of impacts.
➢ Important Ecological Features	• Identifying important ecological features (habitats and species) that may be affected, with reference to a geographical context in which they are considered important.
➢ Impact assessment	• An assessment of whether Important Ecological Features may be subject to potential impacts and characterisation of these impacts and their effects. • Assessment of potential residual ecological impacts of the project remaining after mitigation and the significance of their effects, including cumulative effects.
➢ Avoidance, mitigation, compensation & enhancement	• Incorporating measures to avoid, reduce and/or compensate potential ecological impacts, and the provision of ecological enhancements
➢ Monitoring	• Monitoring impacts of the development and evaluation of the success of proposed mitigation, compensation and enhancement measures.

2.1 Identifying Ecological Features within the Zone of Influence

Information acquired during the desk-study and field surveys, determines the Ecological Features potentially affected by the proposed development, and which occur within its Zone of Influence (ZoI). A standard 15 km radius is used when establishing the ZoI of a development, within which European and nationally designated sites are screened for potential impact. However, in reality, the potential impacts on sites are dependent on the nature of the pressures, the sensitivity of receptors, and the causal links and conduits, rather than distance. In many cases the potential ZoI is considerably less than 15 km (e.g. when considering noise or dust), while in other cases the potential ZoI could be greater than 15 km (e.g. direct hydrological connection).

2.2 Evaluating Ecological Features within the Zone of Influence

Those Ecological Features which occur within the ZoI, such as nature conservation sites, habitats or species, are evaluated in geographic hierarchy of importance. **Table 1** below shows the frame of reference and criteria used for valuation. The approach employed for this

generally follows that set out in a guidance document on EcIA produced by the Republic of Ireland National Roads Authority (NRA, 2009a)[6].

Table 1. Criteria for valuating ecological features within the ZoI (as per NRA, 2009a guidelines).

Importance	Criteria
International Importance	• Sites, habitats and species populations of importance in a European context. • 'European Site' including Special Area of Conservation (SAC), Site of Community Importance, Special Protection Area (SPA) or proposed Special Area of Conservation. • Proposed Special Protection Area (pSPA). • Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). • Features essential to maintaining the coherence of the Natura 2000 Network.7 • Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. • Resident or regularly occurring populations (assessed to be important at the national level) of species of animal and plants listed in Annex II and/or IV of the Habitats Directive. • Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). • Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). • Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). • World Heritage Sites (implications for biodiversity value only) • Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National Importance	• Site designated or proposed as a Natural Heritage Area (NHA). • Statutory Nature Reserve. • Refuge for Fauna and Flora protected under the Wildlife Acts. • National Park. • Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Acts; and/or a National Park. • Resident or regularly occurring populations (assessed to be important at the national level) of the following: - Species protected under the Wildlife Acts; and/or - Species listed on the relevant Red Data list. • Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.
County (Regional) Importance	• Area of Special Amenity. • Area subject to a Tree Preservation Order. • Area of High Amenity, or equivalent, designated under the County Development Plan. • Resident or regularly occurring populations (assessed to be important at the County level) of the following: - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; - Species protected under the Wildlife Acts; and/or - Species listed on the relevant Red Data list. - Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. • County important populations of species; or viable areas of semi-natural habitats; or natural heritage features identified in the National or Local BAP, if this has been prepared. • Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. • Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local Importance (Higher Value)	• Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; • Resident or regularly occurring populations (assessed to be important at the Local level) of the following:

[6] NRA (2009). Guidelines for Assessment of Ecological Impacts of National Roads Schemes (Rev 2). National Roads Authority, Dublin, Ireland.

[7] As described in Articles 3 and 10 of the Habitats Directive. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:31992L0043&from=EN [Accessed September 2023].

Importance	Criteria
	- Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; - Species protected under the Wildlife Acts; and/or - Species listed on the relevant Red Data list. • Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality; • Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local Importance (Lower Value)	• Habitats and species populations of less than local importance but of some value. • Sites or features containing non-native species that is of some importance in maintaining habitat links.

The status of a species as requiring protection at an international level, such as otter *Lutra lutra*, does not necessarily impose an international conservation value on any single example of that species found at the site. Approaches to attributing nature conservation value to species have been previously developed for some species groups such as birds and bats. The approach to attributing nature conservation value to bat populations and foraging habitats is adapted from Wray *et al.* 2010. Bird species conservation status is currently attributed by the Birds of Conservation Concern list 2020-2026, commonly referred to as BoCCI4 (Gilbert *et al*. 2021), as previously evaluated by Colhoun & Cummins (2013).

Only Important Ecological Features, i.e. those features evaluated as being of Local Importance (Higher Value) or greater, within the ZoI are assessed with respect to potential impact.

2.3 Identification and Characterisation of Impacts

When describing ecological impacts reference is made to the following characteristics;

- positive or negative;
- extent;
- magnitude;
- duration;
- timing;
- frequency; and,
- reversibility.

However, the assessment only needs to describe those characteristics relevant to understanding the ecological effect and determining the significance and as such does not need to incorporate all stated characteristics (CIEEM, 2018, updated 2022).

2.4 Significant Effects on Important Ecological Features

For the purpose of rEcIA, significant effect is an effect that either supports or undermines biodiversity conservation objectives for those ecological features which have been identified as being an important feature of the site (Important Ecological Features). Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy). As such effects can be considered significant in a wide range of geographic scales from international to local. Consequently, significant effects are qualified with reference to the appropriate geographic scale (CIEEM, 2018, updated 2022).

2.5 Assessment of Residual Impacts and Effects

After characterising the potential impacts of the development and assessing the potential effects of these impacts on the Important Ecological Features, mitigation measures are proposed to avoid and/or mitigate the identified ecological effects. Once measures to avoid and mitigate ecological effects have been finalised, assessment of the residual impacts and effects is undertaken to determine the significance of their effects on the Important Ecological Features.

2.6 Assessment of Cumulative Impacts and Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2018, updated 2022). Different types of actions can cause cumulative impacts and effects. As such, these types of impacts may be characterised as:

- Additive / incremental – in which multiple activities / projects (each with potentially insignificant effects) add together to contribute to a significant effect due to their proximity in time and space (CIEEM, 2018, updated 2022).
- Associated / connected – a development activity enables another development activity e.g. phased development as part of separate planning applications. Associated developments may include different aspects of the project which may be authorised under different consent processes. It is important to assess impacts of the project as a whole and not ignore impacts that fall under a separate consent process (CIEEM, 2018, updated 2022).

3 ECOLOGICAL SURVEY METHODOLOGY

Surveys of the terrestrial ecology at the site, were undertaken following specific guidelines for the relevant target species outlined below. The importance of the habitats and species present is evaluated using the Chartered Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018, updated 2022). This guidance document outlines an accepted approach for the evaluation of impact from such developments.

3.1 Desk Based Review of Biological Records

Assessment of the 2013-2018 baseline conditions were based on a desk-based review of ecological and hydrological sections within the EIS (May 2009) updated in 2023 (BCL Consultant Hydrogeologists Ltd) for the quarry extension, along with viewing of sequential ortho-imagery from various sources including:

- OSi Mapping[8];
- Google Earth Pro;
- Google Maps[9];
- Bing Maps[10].

For the additional baseline assessments (i.e. 2018/2019 and 2023), a desk-based review of biological records for the area was undertaken utilising information available from the National Biodiversity Data Centre (NBDC)[11]. Tromman Quarry spans two 10-km squares (N74 & N75) and the biological records for both squares were reviewed, as well as the 2 km x 2 km tetrads covering and adjoining the site (N74U, N75Q, N74Z & N75V).The NBDC bat suitability index (Lundy *et al*. 2011), was also consulted.

Information from the NBDC was downloaded from Biodiversity Maps on 07 February 2019, and later updated in August 2023, to inform the additional baseline assessment for the period spanning 2018-2023.

3.2 Surveys Undertaken

Field visits to Tromman Quarry were undertaken in 2018 and 2019, in order to establish an ecological baseline. The details of these site visits are outlined below.

The quarry was visited twice during 2018 and once in 2019 on the following dates:

- Visit 1: 28 August 2018 Surveyor: Kate Bismilla
- Visit 2: 16 October 2018 Surveyor: Mike Trewby
- Visit 3: 18-19 June 2019 Surveyor: Mike Trewby

During these visits, the whole of Tromman Quarry was covered with the primary aim of mapping and describing the habitats within the site, as classified in Fossitt (2000), following

[8] OSI Mapping – Available at: http://map.geohive.ie/mapviewer/ [Accessed August 2018 & 2023].

[9] Google Maps – Available at: https://www.google.ie/maps/ [Accessed August 2018 & 2023].

[10] Bing Maps – Available at: https://www.bing.com/maps/aerial [Accessed August 2018 & 2023].

[11] National Biodiversity Data Centre (NBDC) Maps – Available at: https://maps.biodiversityireland.ie/Map [Accessed August 2018 & 2023].

best practice methodology (Smith *et al.* 2011), as well as collecting information on occurrence and potential suitability for protected species. Ecological information collected, included:

- [redacted]
- Bat survey, including roost and activity survey (by means of seven deployed static detectors).
- Breeding bird survey.
- Assessment of reptile (common lizard *Lacerta vivipara*) and amphibian suitability, notably suitability of waterbodies within the site to support common frog (*Rana temporaria*) and smooth newt (*Lissotriton vulgaris*).
- Protected invertebrate habitat suitability, such as habitat suitability for marsh fritillary butterfly (*Euphydryas aurinia*).
- Non-native, invasive species occurring within the site.

A number of subsequent visits were made during the summer of 2023 in order to provide a contemporary update to the ecological baseline at the site. These visits were conducted on the following dates:

- Visit 1: 12 July 2023 Surveyor: Bruno Mels
- Visit 2: 01 August 2023 Surveyor(s): Oisín O'Sullivan & Frederico Hintze
- Visit 3: 03 August 2023 Surveyor: James O'Connor
- Visit 4: 10 August 2023 Surveyor(s): Giulia Mazzotti & Bruno Mels

These visits entailed the following:

- Breeding birds and updated mammal survey.
- Update to the distribution of habitats on-site.
- Bat surveys, comprising an assessment of the potential roost feature (PRF) on-site, as well as, an activity survey, by means of five static detectors deployed over 13 nights.
- Update on the non-native invasive species occurring within the site.

3.3 Survey Limitations

The 2019 surveys, undertaken within optimal timing for breeding birds, bats and habitats, complemented the 2018 surveys. Given the location of the development, the habitats present on the site and the long-established nature of the development, it is considered that desk-based and ecological field surveys in 2018 and 2019 are sufficient to assess the retrospective ecological impacts.

While the majority of 2023 surveys adhered to the recommended timeframe for target species and habitats, programme constraints hindered the surveying of breeding birds until mid-July and August, falling outside the optimal survey period (April to June). However, it is important to note that the primary aim of these surveys was to provide a contemporary update to data obtained in 2018.

While no targeted surveys for amphibians were undertaken in 2023, this is not considered a limitation, given that the site was considered to be largely unsuitable for amphibians during the 2018/2019 surveys (with the exception of common frog – see **Section 5.3**) and as no suitable waterbodies for newts in particular were identified during surveys conducted in 2023.

3.4 Scoping – Study Areas and Assessment Periods

Due to the primarily retrospective nature of the project to be assessed, the scope of the survey area and time periods require adjustment to match with the different phases of the project to be assessed, as laid out in **Table 2**.

Table 2. Scope of the survey period and time periods to be assessed.

Study area **Activities to be assessed**	**Assessment period**	**Significant effects / impacts which -**
Northern part of site *Pre-cast concrete manufacturing facility* Whole quarry *Continued quarrying operations*	Baseline: 2013 (2013 to 05 August 2018; 05 August 2018 to submission of SC)	- have occurred
Whole quarry *All site activities assessed cumulatively*	Additional baseline: 2023 (July / August 2023 to submission of SC)	- are occurring
Whole site *two alternatives:* *a) Immediate remediation* b) *Continued operations under separate consent*	Immediate remediation and site restoration and post-restoration and continued consented operations under separate approval.	- are reasonably expected to occur

4 DESIGNATED SITES WITH POTENTIAL ECOLOGICAL / HYDROLOGICAL CONNECTIONS TO THE DEVELOPMENT

4.1 European Sites

The EPA Guidelines for Environmental Impact Assessment Reports (EPA, 2022) states in section 3.3.5 that:

> *A biodiversity section of an EIAR, for example, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement, but it should refer to the findings of that separate assessment.*

This approach has been adopted and the conclusions of the Remedial Natura Impact Statement (rNIS) (Woodrow, 2023b) are referenced. No part of the application site lies within a designated Special Area of Conservation (SAC) or Special Protection Area (SPA). A map showing the European Sites within 15 km of Tromman Quarry is illustrated in **Figure 2** below. As a result of hydrological connections two European Sites were brought through to Stage 2 Appropriate Assessment. The European Sites and the Qualifying Interests (QIs) / Special Conservation Interests (SCI) assessed were:

- River Boyne and River Blackwater SAC - Qualifying Interests:
  - Alkaline fens
  - *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno - Padion, Alnion incanae, Salicion albae)
  - River lamprey (*Lampetra fluviatilis*)
  - Otter (*Lutra lutra*)
  - Salmon (*Salmo salar*)
- River Boyne and River Blackwater SPA – Species of Community Interest:
  - Kingfisher (*Alcedo atthis*) – breeding

The concluding statement of the rNIS (Woodrow 2023b) is as follows:

> *The two European Sites, and associated QI/SCIs listed above, were assessed as part of the AA process. This process found that whilst a number of potential impacts pertaining to water quality were identified, including in-combination impacts, the mitigation measures presented in Section 6 eliminate the potential for any adverse effects.*
>
> *Taking into account the best available scientific knowledge, applying the precautionary principle, and considering the conservation objectives of the relevant European Sites, it is concluded that the three quarry proposals, whether on their own or in conjunction with other plans or projects, do not pose or have not posed an adverse impact on the integrity of any European Site.*

There is a gradient dropping south away from the site and therefore, the potential for connectivity between the site and the River Boyne via a stream to the south of the site (Formal Stream) was also investigated. The distance from Tromman Quarry to the Special Area of Conservation (SAC) via this southern stream is shorter (*c.* 1.6 km). This stream flows into a tributary of the River Boyne before joining the main river at Boardsmill, covering a distance of approximately 5 km. However, given the lack of any pathway, the proposed development poses no risk to this watercourse. (BCL Consultant Hydrogeologists Ltd., 2023).

Excess surface water from the quarry is pumped up to the drainage infrastructure (seven-stage settlement tanks) at the northern end of the land holding. Four of the settlement tanks are sited to the east of the overburden storage area and the final three tanks are situated alongside the south-east corner of the pre-cast manufacturing structure. The water from these tanks is discharged into a culvert, equipped with a V-notch weir, which includes a data logger for monitoring and recording water flow data. This in turn connects with an open drainage channel leading to the consented discharge point, as covered by Trade Effluent Discharge Licence Ref. 04/2. There is no natural baseflow in this drainage channel. It was excavated for the sole purpose of conveying water from the settlement tanks to the discharge point (BCL Consultant Hydrogeologists Ltd., 2023).

4.2 Nationally Designated Sites

No part of the application site lies within an NHA or pNHA. A map showing the NHAs and pNHAs within 15 km of Tromman Quarry is illustrated in **Figure 3** below. There was only one NHA within 15 km of Tromman Quarry and six pNHAs. These sites are located between 2 km and 14 km from the quarry and there is considered to be no ecological or hydrological connection between these sites and the quarry.

Natural Heritage Areas (NHAs) and distance from Tromman Quarry

- Molerick Bog *c*. 10. 5 km

Proposed Natural Heritage Areas (pNHAs) and distance from Tromman Quarry

- Ballina Bog *c*. 9.8 km
- Ballynabarry Fen *c*. 9.7 km
- Mount Hevey Bog *c*. 13.3 km
- Rathmolyon Esker *c*. 2.0 km
- Royal Canal *c*. 8.1 km
- Trim *c*. 8.1 km

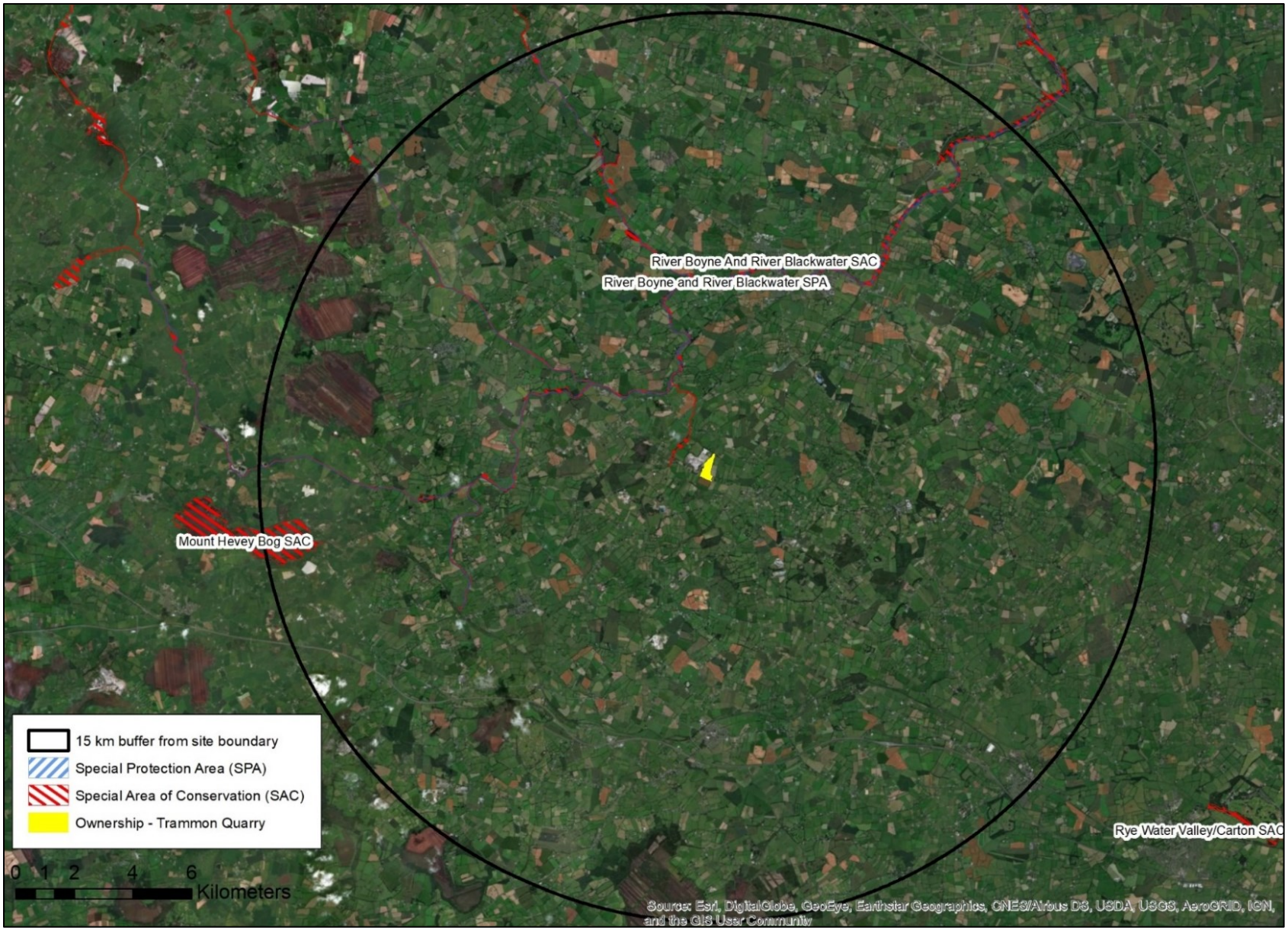


Figure 2. European Designated Sites (European Sites) within 15 km of the Tromman Quarry site.

Figure 3. Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) within 15 km of the Tromman Quarry site.

5 BASELINE CONDITIONS

5.1 Surrounding Landscape Character

Tromman Quarry is located within a rural setting, where the landscape is dominated by pastural agriculture with patches of arable production. There is another quarry directly adjacent to Tromman Quarry that is operated by Kilsaran.

5.2 Baseline Conditions: 2013 – Pre-cast Concrete Manufacturing Facility

The retrospective 2013 baseline only applies to the area occupied by the pre-cast concrete manufacturing facility. This facility occupies the entire northern section of the Tromman Quarry site. Sequential OSi aerial imagery (1992, 2000, 2005) shows that the area was claimed from a single field of improved agricultural grassland GA1 (OSi mapping). Conversion from grassland to concrete hardstand commenced around 2003. By 2005 all the grassland vegetation and topsoil had been stripped and more than half the original area was under a concrete hardstand. Aerial imagery (Google Earth Pro) shows that by 2009 the concrete hardstanding with associated roads and industrial buildings had been extended across the entirety of the former northern field, well before the baseline 2013 year for this assessment.

The hedgerows WL1/ treelines WL2 forming the western, eastern and northern boundaries of the facility were retained. A long established field drain previously flowing east-west along what has become the southern boundary of the facility had been removed by 2005. The facility's southern boundary has become demarcated by the pile of overburden from quarry activities, with the two access roads leading into the facility on the east and west side of this spoil heap.

While the positioning and extent of structures within the facility have changed since 2009, the habitats (as classified in Fossitt 2000) occurring within the area have not, and the area is almost exclusively classed as buildings and artificial surfaces BL3. As the unauthorised erection of the limestone powder plant and extension of the associated pre-cast manufacturing facilities are on the pre-existing hardstanding, they have not resulted in the loss of any semi-natural or natural habitats within the site. The only potential impacts are shading of the mature eastern boundary hedgerow.

The original hedgerows WL1/ treelines WL2 on the periphery of the site have been retained. Likewise, the open drains (small streams) FW4 on the western and northern boundaries of the facility have been retained. By 2013 a large ditch FW4 with associated banks formed part of the eastern site boundary, along with remnant hedgerows WL1 and treelines WL2. Prior to the construction of concrete settlement tanks (2016/2017) this ditch formed the settlement lagoons. This ditch was later excavated, as a channel for directing the flow of water from the settlement tanks to the licenced discharge point into the northern stream. There is no natural baseflow in this drainage channel, with the flow rate being and continuing to be entirely dependent upon the discharge rate at the settlement tanks.

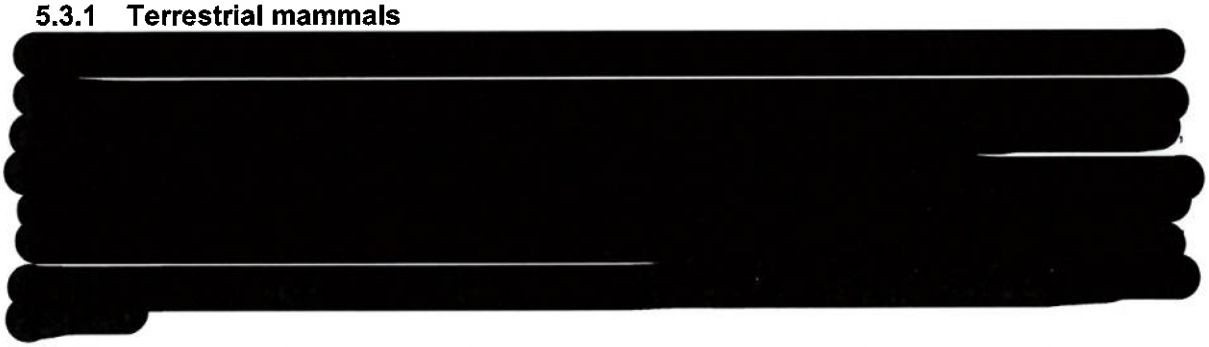
At the time of the 2013 baseline only the watercourses, hedgerows and treelines on the periphery of the northern part of the site remained devoid of development and represent the

only areas of potential value to wildlife. At this time these linear features are likely to have provided foraging and commuting areas for bats and nesting sites for birds.

5.3 Baseline Conditions: 2018/2019 – Whole Quarry

Site visits undertaken in 2018 and 2019 provide information on the 2018/2019 baseline within the site. These visits assessed the quarry and the pre-cast concrete manufacturing facility as a whole and can be used to provide context to the ecological changes that have occurred across the site post 05 August 2018. The results of these surveys are outlined in the following subsections.

5.3.1 Terrestrial mammals



While numerous trails were detected criss-crossing the overburden currently stored in the centre of the site, no setts were recorded during surveys. A possible fox (*Vulpes vulpes*) earth was recorded at the edge of a dense patch of dense bramble/willow scrub located on the steep slopes above the quarried face.

Investigating mammal usage within the manufacturing facility is problematic, as the concrete hardstand makes it difficult to track animals. By its nature, the hardstand associated buildings, plant and curing / stored product are unlikely to offer suitable habitat for most mammal species, other than rodents.

Other mammals listed as occurring in the wider area as part of the desk study performed in 2019 (10-km squares N74 & N75) included wood mouse (*Apodemus sylvaticus*), house mouse (*Mus musculus*), brown rat (*Rattus norvegicus*), grey squirrel (*Sciurus carolinensis*), rabbit (*Oryctolagus cuniculus*), Irish hare (*Lepus timidus hibernicus*), pygmy shrew (*Sorex minutus*), hedgehog (*Erinaceus europaeus*), pine marten (*Martes martes*), otter, mink (*Neovison vison*) and red deer (*Cervus elaphus*) (NBDC). House mouse, brown rat, grey squirrel, and mink are all listed as high impact invasive species by the NBDC, with rabbit listed as medium impact invasive species. The limited availability of woodland in the environs of the site is likely to restrict the occurrence of typical woodland species like pine marten to animals dispersing or commuting through the area. The quarry would also be considered largely unsuitable for sustaining hare, hedgehog, and deer populations. Similarly, although otters may use the various tributaries of the River Boyne, the small size of the drain running along the northern boundary of Tromman makes it suboptimal and means that any usage will only be periodic at most.

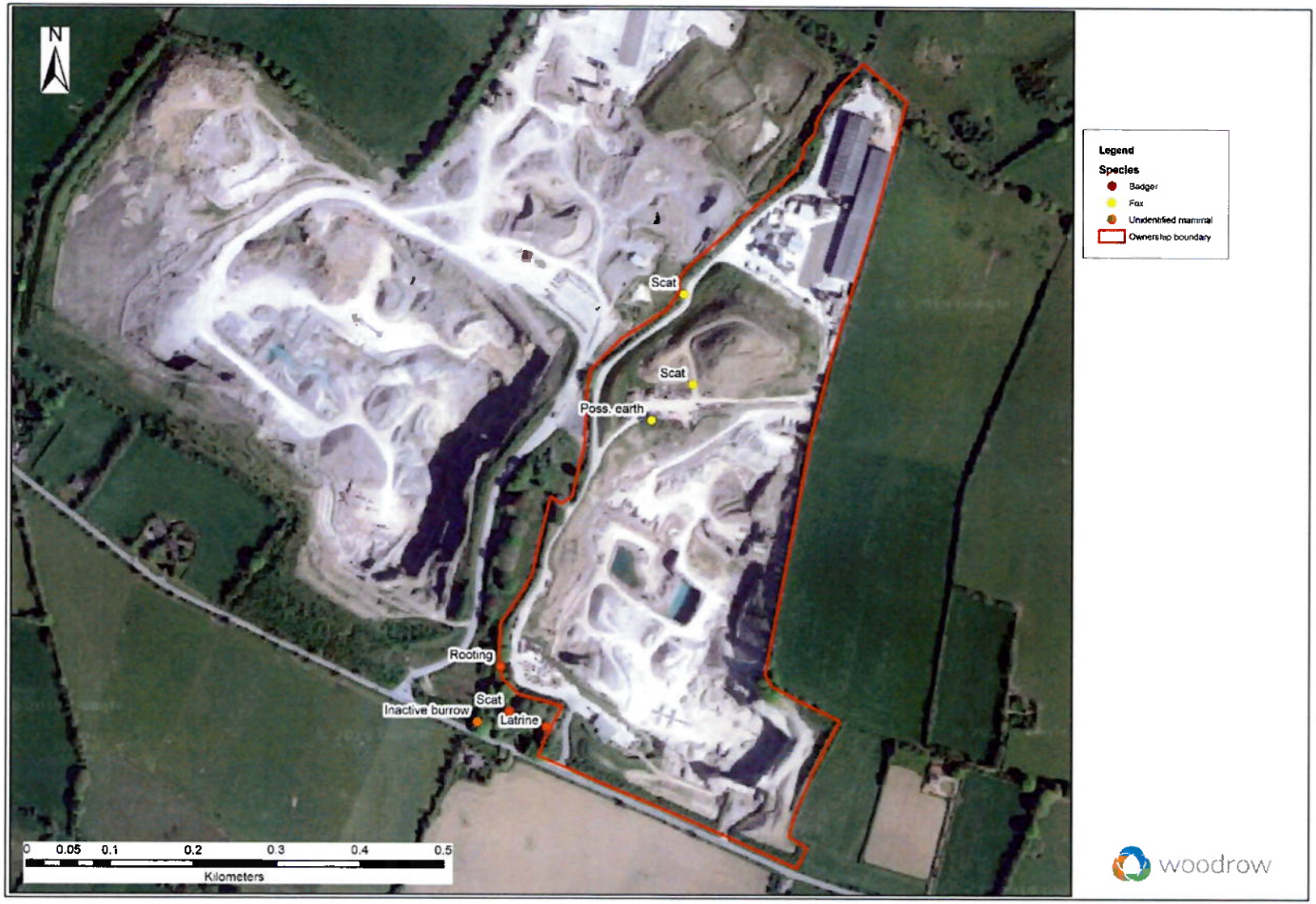


Figure 4. Distribution of terrestrial mammal activity within Tromman Quarry during the surveys performed in 2018.

5.3.2 Bats

Bat suitability indices are displayed online at NBDC maps within 5 km x 5 km squares. The squares surrounding the quarry have been scored as holding habitats of moderate suitability for bats. Scores were at the upper end of the moderately suitability category for three squares, with the score for one of the squares neighbouring the site being just over the threshold for classification as mod-high suitability. For individual species, habitat suitability was ranked as:

- Moderate-high for four species: common (*Pipistrellus pipistrellus*) and soprano (*Pipistrellus pygmaeus*) pipistrelles, Leisler's (*Nyctalus leisleri*) and Daubenton's bat (*Myotis daubentonii*);
- Moderate for two species: brown long-eared (*Plecotus auratus*) and Natterer's bat (*Myotis nattereri*);
- Moderate-low for two species: Nathusius' pipistrelle (*Pipistrellus nathusii*) and whiskered bat (*Myotis mystacinus*);
- Nil for lesser horseshoe bat (*Rhinolophus hipposideros*), as this region does not support the species.

In terms of habitat features within the site, broadleaved woodland, hedgerows, treelines and watercourses, which are all located around the periphery of the site, are likely to offer the best foraging opportunities for bats. While limited to the outer edge of the site, it was noted that there is good potential for connectivity between these habitat features within the application site and wider area.

Bat surveys were undertaken on the night of 18-19 June 2019 by means of seven deployed static bat detectors around the site. In addition, a roost emergence survey was conducted at the garage scheduled for demolition in the south-east of the site and this was followed by a bat activity transect around the outer parts of the site. These surveys revealed the presence of common and soprano pipistrelle, Leisler's bat, brown long-eared bat, and *Myotis* spp. at the site. As would be expected, activity was generally concentrated around the more suitable habitats on the periphery of the site, with limited activity within the core disturbed or built-up parts of the site.

Locations of the bat detectors deployed in 2019 are shown in **Figure 5** and the number of passes by each species at the detector locations are shown in **Table 3**.

NBDC records show the occurrence of Leisler's (9), common (65), soprano (1) and Nathusius' (1) pipistrelles in 2014 (N75Q). These four species along with Daubenton's and brown long-eared have also been recorded in the wider area within the two 10-km square covering the site (N74 & N75).

From 2012-2019, the extension of the active face in the south-eastern corner of the quarry resulted in the loss of some habitat features potentially utilised by bats that may have affected connectivity through the site. A section of beech hedgerow (*c*. 55 m), a treeline/hedge (*c*. 90 m) and an earth bank/hedge (*c*. 145 m) along the old top of the quarry face have been removed. The negative impacts of habitat removal have been compensated for by the planting of a broadleaved screening belt along the southern boundary of the site.

Potential roosts identified at the site during the 2019 survey, were limited to ruined and disused buildings (including an abandoned gate lodge within woodland, outside the southern boundary of the site (see **Plate 1**), and a disused modern garage (**Plate 2**) (see **Figure 5** for locations), and some ivy clad trees with occasional older specimens offering deadwood and knots.

Preliminary assessment of potential roosts found the tree sites to have low to negligible suitability due to the limited level of shelter provided and are only likely to be used opportunistically by small numbers of bats. The suitability of the abandoned gate lodge for roosting bats was assessed as low to moderate due to the roof having been collapsed and cover limited to chimneys, occasional fissures between stonework and some overhangs created between buckled plaster and walls. The abandoned farm buildings (Trommant) located outside the site and on the lands of the neighbouring quarry (Kilsaran) were identified as having moderate to high potential suitability as a roost site. Contemporary buildings identified within the site were steel and aluminium sheds, which are generally considered to have limited suitability as bat roosts. To facilitate quarry expansion a dwelling was demolished in the south-eastern corner of the site. As of 2019, all that remained was a small, relatively modern red-brick garage. An emergence survey was undertaken at this building on 18 June 2019, however no bats were recorded emerging from the building.

Table 3. Bat species recorded at Tromman Quarry on 18-19 June 2019.

SM2 unit id number (Habitat feature)	Number of bat passes	Species recorded
WSS-03 (Treeline/hedgerow)	125	Brown long-eared bat Common pipistrelle Soprano pipistrelle Leisler's bat
WSS-07 (Garage/beech hedgerow)	37	Common pipistrelle Soprano pipistrelle Leisler's bat
WSS-08 (At ruin in woodland outside site)	489	Common pipistrelle Soprano pipistrelle Leisler's bat *Myotis* sp.
WSS-10 (At settlement tanks next to treeline/hedgerow)	1	Common pipistrelle
WSS-12 (Ditch & treeline next to discharge channel)	215	Brown long-eared bat Common pipistrelle Soprano pipistrelle Leisler's bat
WSS-13 (Treeline/hedgerow consisting of beech trees)	44	Common pipistrelle Leisler's bat
WSS-14 (Beside potential roost buildings at Trommant next to treeline/hedgerow)	106	Common pipistrelle Soprano pipistrelle Leisler's bat

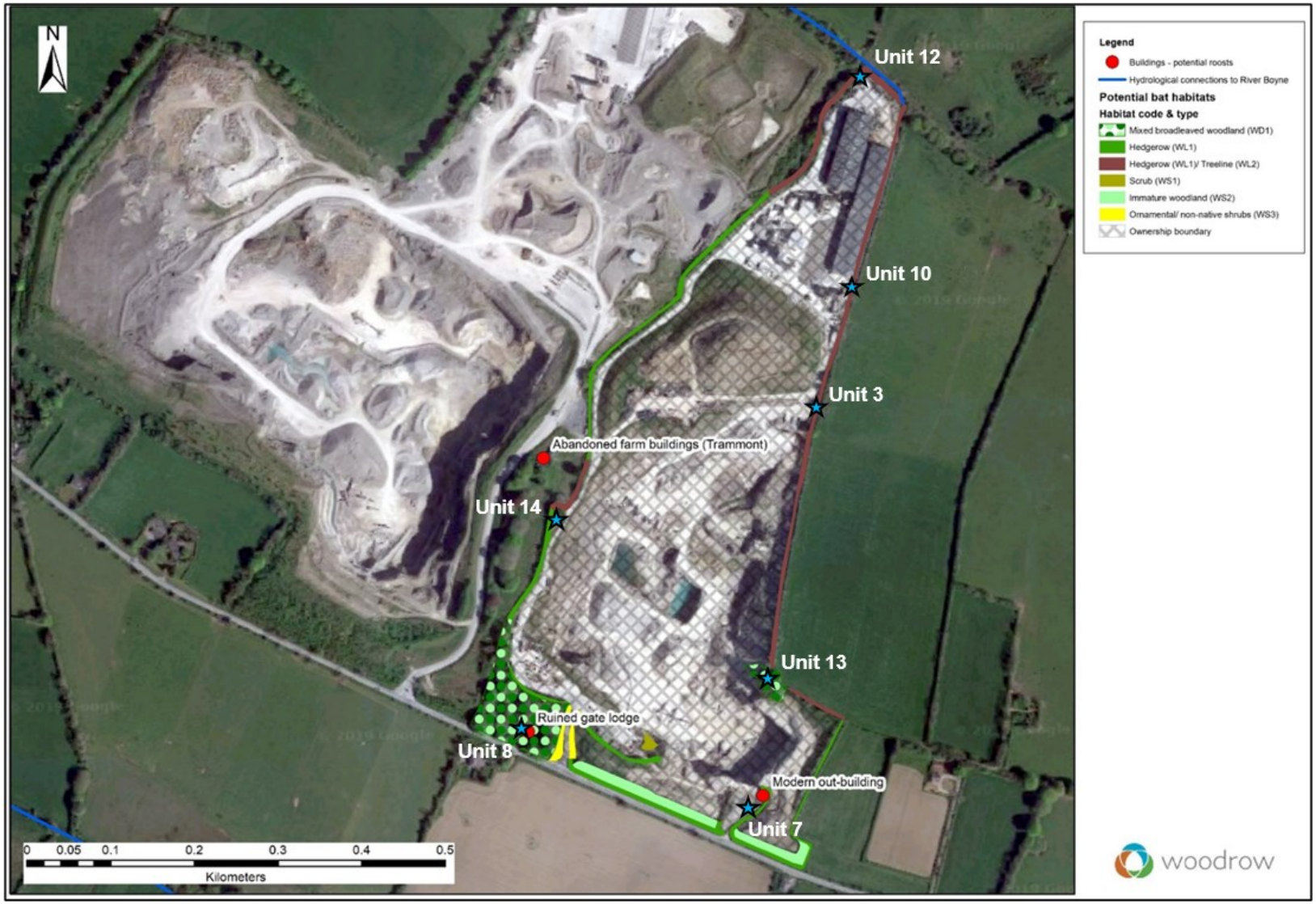


Figure 5. Tromman Quarry - location of static bat detectors (June 2019) and locations of potential bat roost and foraging habitats identified as part of the 2019 surveys.

Plate 1. Abandoned gate lodge showing examples of potential roost spaces.

Plate 2. Disused garage showing internal structure of building.

5.3.3 Birds

The bird species recorded during the site visits performed in 2018 (and desk studies) were typical for the habitat availability in the area – predominately an intensively managed pastural landscape with some arable cultivation and a network of hedgerows / treelines and small woodlands.

Birds recorded during the site visits were mostly common, widespread species including (* indicates breeding behaviour observed): lesser black-backed gull (*Larus fuscus*); raven (*Corvus corax*)*; hooded crow (*Corvus cornix*); rook (*Corvus frugilegus*); jackdaw (*Corvus monedula*); magpie (*Pica pica*); wood pigeon (*Columba palumbus*); feral pigeon (*Columba livia domestica*); starling (*Sturnus vulgaris*); swallow (*Hirundo rustica*)*; house martin (*Delichon urbicum*); sand martin (*Riparia riparia*); wren (*Troglodytes troglodytes*); robin (*Erithacus rubecula*); goldcrest (*Regulus regulus*)*; blackcap (*Sylvia atricapilla*)*; whitethroat (*Sylvia communis*)*; chiffchaff (*Phylloscopus collybita*)*; willow warbler (*Phylloscopus trochilus*)*; great tit (*Parus major*)*; coal tit (*Periparus ater*)*; blue tit (*Cyanistes caeruleus*)*; blackbird (*Turdus merula*)*; song thrush (*Turdus philomelos*)*; mistle thrush (*Turdus viscivorus*); pied wagtail (*Motacilla alba*); meadow pipit (*Anthus pratensis*)*; chaffinch (*Fringilla*

coelebs)*; goldfinch (*Carduelis carduelis*)*; linnet (*Linaria cannabina*)*; yellowhammer (*Emberiza citrinella*)*.

In addition, there was a territorial pair of peregrine falcon (*Falco peregrinus*) located at the site, which are likely to have been using the site, or the adjacent quarry for breeding. A raven nest was also located at the site. The only red-listed species of conservation concern (Colhoun & Cummins, 2013)[12] recorded during site visits were meadow pipit and yellowhammer. The hedgerows on the periphery of the site, in close proximity to cereal fields were noted to have the potential to support nest sites for yellowhammer and a singing male was recorded at the south-eastern boundary of the site. One, and possibly two pairs of meadow pipit were nesting on the suitably vegetated lower levels of the large spoil heap in the centre of the site.

Based on NBDC data only red-listed species of conservation concern (Colhoun & Cummins, 2013) in the tetrads (2 km x 2 km square) covering the site were yellowhammers. Amber-listed species (Colhoun & Cummins, 2013)[13] with potential to be breeding at the site included starling, swallow, house martin and house sparrow (*Passer domesticus*). Other amber-listed species recorded in the direct environs of the site were spotted flycatcher (*Muscicapa striata*), which could potentially breed in the woodland adjacent to the site.

Other species of conservation concern that have associations with the built environment and quarries include kestrel (*Falco tinnunculus*) (amber-listed at the time, and currently red-listed – Gilbert *et al*., 2021), which have been recorded within the 10-km squares covering Tromman Quarry. The quarried cliffs do offer potential nesting ledges for this species.

Kingfisher (*Alcedo atthis*) (Annex I and amber-listed) are likely to travel up and utilise the various tributaries of the River Boyne; and could potentially reach the stream/ditch running along the northern boundary of Tromman Quarry. However, the small size of the watercourse means that any usage would only be periodic.

5.3.4 Reptiles and amphibians

A search of the NBDC database found that the only reptile or amphibian records for the 10-km squares covering Tromman Quarry were common frog. It is likely that any standing water within the site has the potential to be inhabited by frogs during the breeding season. While some aspects of the site would be ostensibly suitable for common lizard (*Zootoca vivipara*) in habitat terms, the level of disturbance within the site and the agriculturally improved nature of the surrounding habitat means that this species is unlikely to occur.

The settlement tanks on the eastern boundary of the site, were assessed as unsuitable for smooth newt breeding ponds, as they are essentially vertical-sided concrete tanks that do not exhibit any of the more natural features typically favoured by newts, such as vegetated, relatively shallow edges. Other areas of water at the base of the quarry were noted to be highly transient in nature due to pumping and shifting of quarrying activities, and as such were assessed as unsuitable for newt.

[12] During the 2018 breeding bird surveys, the relevant BoCCI assessment was based on the Colhoun & Cummins (2013) evaluation.

[13] Amber-listed status of these species remained the same for the updated conservation status assessments (Gilbert *et al*., 2021).

5.3.5 Flora and habitats

No rare plants listed under the Flora (Protection) Order, 2015[14] were located within Tromman Quarry during the site walkover performed in 2018, or as part of the data searches undertaken to inform the 2019-2019 baseline (NBDC).

Figure 6 provides a map showing the occurrence of habitat types identified within the site during the 2018 walkover, as classified in Fossitt (2000). The following provides a description of these habitats, based on the habitat classifications outlined in Fossitt (2000).

FL8 Other artificial lakes and ponds

Sequential aerial imagery shows that Tromman Quarry has had water bodies associated with the deepest areas of extraction at the base of the quarry, i.e. the quarry sump. The location of these waterbodies has shifted over time, mirroring quarry face progression. The dry conditions experienced during 2018, combined with de-watering meant that no significant ponds where visible during site visits. Water was observed pooling in places at the base of the quarry and this was very shallow and coloured with a heavy sediment load.

As referenced above, there is a constructed system of holding tanks running along the eastern boundary of the site, which is a control measure to trap sediment and prevent contamination of surface waters. This consists of a series of vertical sided concrete tanks and as such have no natural features. Galvanized steel meshed security fencing limits access to the tanks.

FW4 Drainage ditches

A drainage ditch was observed flowing west along the northern boundary of the site. The flow was largely anthropogenic in origin, arising from de-watering activities in the quarry and upstream of the discharge point there was no baseflow. This watercourse is within the River Boyne catchment and flows over *c.* 10 km, via the Knightsbrook River to join the Boyne to the north of the site, just east of Trim.

GA2 Amenity grassland

Several small areas within the site were noticed to have been landscaped and managed as short grassy lawns, including the verges along the quarry roads. The predominately grassy swards, although far from being species rich, were observed to support moderate assemblages of broadleaved herbs and the following species were recorded dandelion (*Taraxacum* spp.), clovers (*Trifolium* spp.), plantains (*Plantago* spp.), yarrow (*Achillea millefolium*), common knapweed (*Centaurea nigra*), self-heal (*Prunella vulgaris*) and charlock (*Sinapis arvensis*).

WD1 (Mixed) broadleaved woodland

The only area within the site mapped as WD1 broadleaved woodland was a small stand of beech trees just north of where the quarry face has recently been extended.

WS1 Scrub

Although only small areas have been mapped as WS1 scrub, there were several patches where scrub, predominately gorse (*Ulex europaeus*), brambles and willow (*Salix* sp.) were colonising previously bare ground. These patches of scrub have been incorporated within areas mapped as ED3 recolonising bare ground. Scrub encroachment was particularly

[14] During the habitat surveys conducted in 2018, the applicable Flora (Protection) Order was the order made in 2015. However, this order has since been replaced by the Flora (Protection) Order, 2022 (S.I. No. 235 of 2022).

noticeable at the top of the quarry faces where the gradient was less steep and experiencing soil accumulation, as well as on parts of the central stockpile of overburden.

WS2 Immature woodland

A screening belt (*c*. 10m wide) of predominately broadleaved species was planted along the southern boundary of the site, stretching east from the site entrance to the southeast (*c*. 290 m). This woodland was noted to be relatively young (*c*. 6 years old) and was planted in 2012. Species recorded include birch (*Betula* spp.), ash sp. (*Fraxinus* sp.), rowan (*Sorbus aucuparia*), common osier (*Salix viminalis*), maple sp. (*Acer* sp.) and larch (*Larix* sp.). The woodland was planted infield of the original roadside hedgerow that is dominated by hawthorn with the occasional ash, elder, grey willow and sycamore.

WS3 Ornamental/ non-native scrub

Two beds on the embankments either side of the main entrance were planted with ornamental shrubbery. Though these were predominately shrubs, some of the elements could also be classed as BC4 (Flower beds and borders). As all the species planted are non-native, further investigation may be warranted in order to identify exotic species and determine the suitability of the current planting scheme, as a control measure to prevent the risk of introducing invasive species.

WL1 Hedgerows

Almost the entire outer perimeter of the site was recorded as being demarcated with hedgerows. The age and condition of the hedgerow varied from some recently planted dense hedging along the western boundary to older remnant hedgerows taking on the characteristics of WL2 treelines. Hawthorn was the dominant hedgerow species, with bramble, elder, ash, willow, pivot, ivy and dog rose all featuring.

Since 2012 the extension of the active face in the south-eastern corner of the quarry, has resulted in the loss of a section of beech hedgerow (*c*. 55 m) and an earth bank (embankment) and associated hedge (*c*. 145 m) along the former top of the quarry face.

WL2 Treelines

At the time of surveying, many of the hedgerows along the site boundary were not heavily managed and developing into treelines. Between 2012 and 2018 a length of treeline/hedge (*c*. 90 m) was removed in the southeast of the site during works to extend the active quarry face.

Disturbed ground

According to Fossitt (2000) exposed rock, piles of spoil or quarried material and bare ground within an active quarry should be classified as ED4 - active quarries and mines. A decision was taken to deviate slightly from Fossitt (2000) and make a distinction between areas being actively quarried (ED4), areas of spoil/bare ground (ED2), recolonising bare ground (ED3) and built infrastructure within the quarry (e.g. roads) (BL3). Areas where quarried material is temporarily stored within the site were mapped as either ED4 (active quarry) or BL3 (built infrastructure) if on a concrete hardstand.

ED2 Spoil and bare ground

Within Tromman Quarry two basic categories of spoil and bare ground were considered, including:

- Overburden (spoil) consisting of topsoil and subsoil that had been stripped off the surface of the site to facilitate access to the quarriable material beneath. The overburden was then stored within the confines of the site forming a large mound in the centre of the site. This spoil was considered to be a good substrate for colonising plants and it is typically rich in nutrients. The spoil will be utilised for restoration works to infill the quarry.
- Areas where the topsoil and subsoil had been stripped off exposing the upper layers of the quarriable material, which is exposed rock often with a covering of loose rocky till where access to soil and nutrients for plants are limited. The area in the south-east of the site where the overburden had been stripped was mapped as bare ground.

Vegetation cover was notably sparse and non-existent in some places, due to the recent dumping or stripping of material. The following species were recorded often as single isolated plants:

Oxeye daisy (*Leucanthemum vulgare*)	Nettle (*Urtica dioica*)
Nipplewort (*Lapsana communis*)	Clovers (*Trifolium* sp.)
Coltsfoot (*Tussilago farfara*)	Yorkshire fog (*Holcus lanatus*)
Figwort (*Scrophularia nodosa*)	Dandelion sp. (*Taraxacum* sp.)

ED3 Recolonising bare ground

Areas within the site were mapped as recolonising bare ground where vegetation cover was > 50 %. This habitat type was found around the lower slopes of the overburden stockpile, although in parts the nutrient rich spoil was facilitating the dominance of course grass species like Yorkshire fog. The small screening mound of material, on the eastern side of the site entrance, was also relatively rich in nutrients; as evidenced by a dominance of course grasses, nettles, thistles and docks within the re-colonising species. Areas at the top of the quarry faces where the gradient became less steep and subject to soil accumulation were mapped as recolonising bare ground. The following species were recorded here:

Field horsetail (*Equisetum arvense*)	Clovers (*Trifolium* sp.)
Creeping bent (*Agrostis stolonifera*)	Docks (*Rumex* sp.)
Yorkshire fog (*Holcus lanatus*)	Nettle (*Urtica dioica*)
Cock-foot (*Dactylis glomerata*)	Creeping buttercup (*Ranunculus repens*)
Ragwort (*Senecio jacobaea*)	Creeping thistle (*Cirsium arvense*)
Silverweed (*Potentilla anserina*)	Spear thistle (*Cirsium vulgare*)
Oxeye daisy (*Leucanthemum vulgare*)	Hogweed (*Heracleum sphondylium*)
Selfheal (*Prunella vulgaris*)	Colts foot (*Tussilago farfara*)
Common knapweed (*Centaurea nigra*)	Rosebay (*Chamerion angustifolium*)
Dandelion (*Taraxacum* sp.)	Sow thistle (*Sonchus asper*)

In small patches scrub encroachment was evident with willow (*Salix* sp.), bramble (*Rubus fructicosus* agg.) and gorse (*Ulex europaeus*) noted and at a small number of locations two

non-native species were recorded - butterfly-bush (*Buddleja davidii*) and traveller's-joy (*Clematis vitalba*). In places, the saplings of tree species were noted including willows (*Salix* sp.), sycamore (*Acer pseudoplatanus*) and *Cypress* spp. (possibly *Cupressus* × *leylandii*).

ED4 Active quarries and mines

As shown in **Figure 6**, the majority of the site at Tromman is an active quarry, which is largely exposed limestone.

Built land

BL2 Earth banks

There were noted to be several longstanding earth banks within the site, mainly occurring along the perimeter. These were associated with hedgerows and/or treelines and were mapped as such (see **Figure 6**). Stretches of relatively new constructed embankments (berms) around the upper edge of quarry faces were classed as earth banks.

BL3 Buildings and artificial surfaces

The northern part of the site, involved in the manufacturing of concrete products, was entirely under a concrete hard stand with several associated sheds, buildings and plant. This northern section was connected to the working quarry, spoil storage area and the main entrance via two roads both surfaced with concrete or hard core. The main offices for Keegan Quarries Ltd were located at the southern end of the site, just beyond the main site entrance, with the southern end of the site also having substantial areas of hardstanding for parking cars and machinery.

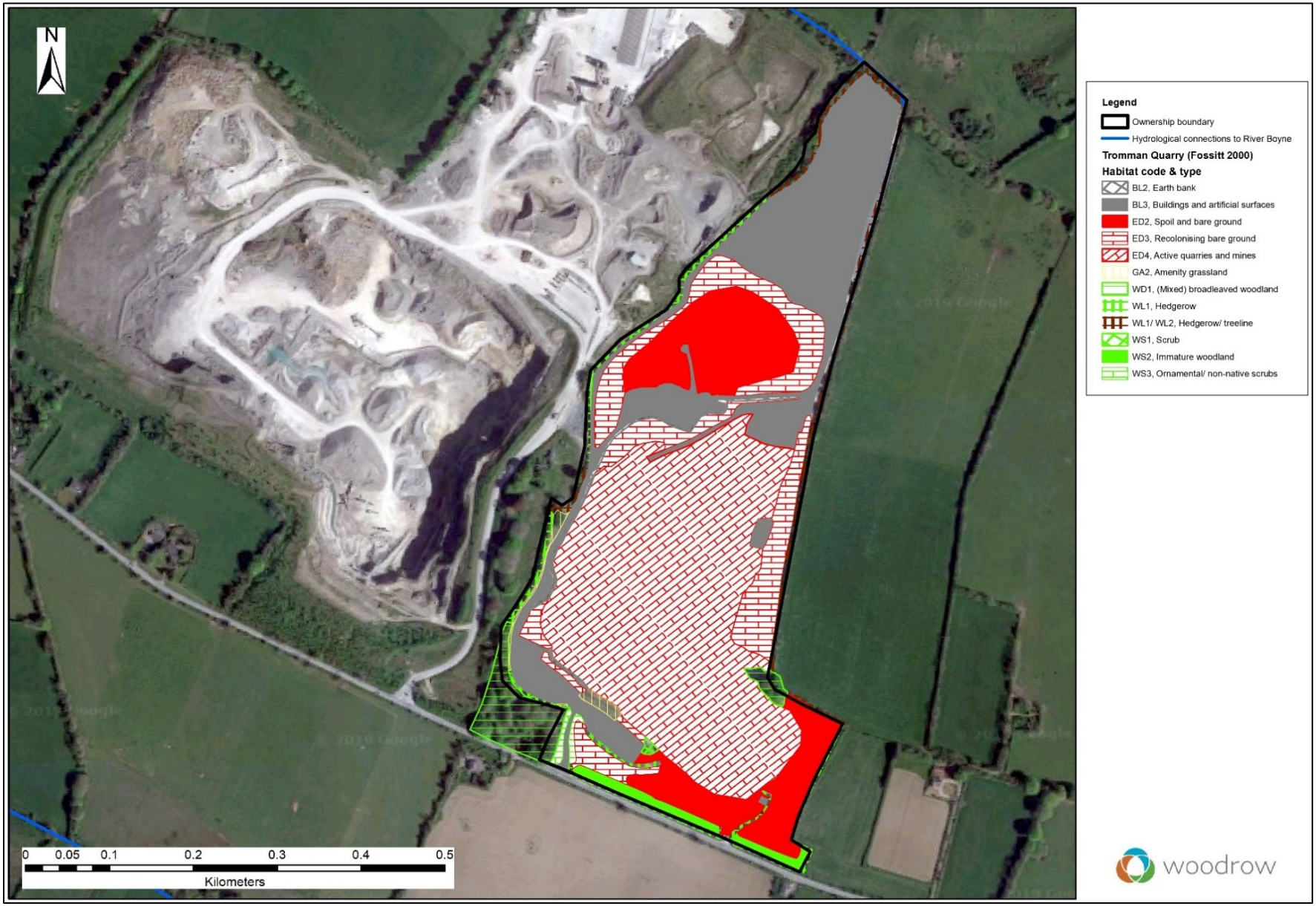


Figure 6. Habitat types mapped in Tromman Quarry as of 2018 and classified according to Fossitt (2000).

5.3.6 Invasive species

Figure 7 shows the distribution of non-native and potentially invasive plant species within Tromman Quarry during the 2018/2019 survey period. No high impact invasive plant species (as listed by NBDC) were recorded during the site visits. Likewise, there were no plant species recorded that are included on the Third Schedule of Regulations 49 and 50 (not yet in effect) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).

Two medium impact invasive species (as listed by NBDC) occurring on the site were traveller's-joy (*Clematis vitalba*) and sycamore (*Acer pseudoplatanus*). Although not listed by NBDC, snowberry (*Symphoricarpos albus*) was recorded within woodland adjacent to the site. Amber-listed species recorded within the site included butterfly bush (*Buddleja davidii*), *Cotoneaster* sp., and European beech (*Fagus sylvatica*). As indicated in **Figure 7**, leading into the site from the main entrance were two embankments on either side of the road, which were planted with an array of non-native shrubs.

The non-native species identified as occurring within Tromman Quarry as of 2018/2019, and which could pose a potential risk of spreading and infecting quarried product were traveller's-joy, Buddleia and possibly sycamore.

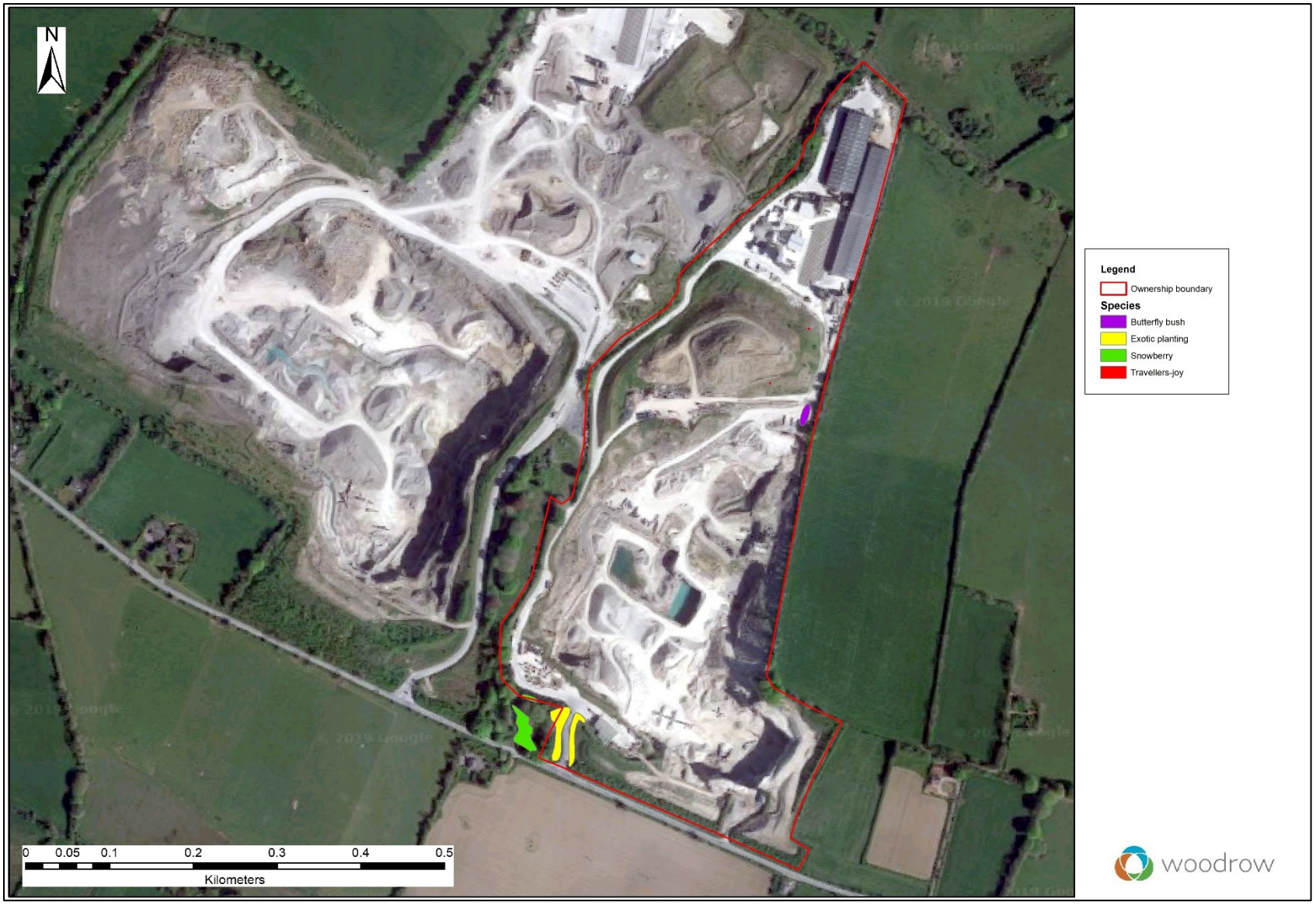


Figure 7. Tromman Quarry - map showing the distribution of non-native species recorded during the 2018/2019 site visits.

5.4 Additional Baseline Conditions: 2023 – Whole Quarry

Additional site visits were undertaken in 2023, in order to provide a contemporary update to the ecological baseline already established in 2018/2019. As before, these visits assessed the quarry and pre-cast concrete manufacturing facility as a whole. Where appropriate, reference is made to the previous surveys undertaken, in order to assess any change to the baseline condition that might have occurred between the two survey periods. The findings of the 2023 site visits are outlined in the following subsections.

5.4.1 Terrestrial Mammals

[redacted] These were often accompanied by scent marks indicative of fox (*Vulpes vulpes*) activity. Within the same woodland, a single burrow was discovered at the base of a tree (see **Figure 8**). This burrow measured approximately 40 cm in width and 25 cm in height, and it appeared to be in active use. Like the trails identified, the scent associated with this burrow also suggested it was likely inhabited by fox. Furthermore, fresh fox faeces was found on one of the verges west of the quarry road leading to the manufacturing facility.

[redacted]

There was evidence of rabbit activity within the environs of the site (mainly in the form of droppings), and one Irish hare was observed in the field to the east of the quarry. One small unidentified burrow was recorded in the northwest of the site, however, this too looked inactive. There was one old faeces (scat) recorded on top of a large boulder along the road in the west of the site, which was suspected to belong to pine marten, and most likely originated from an individual commuting through the site. As already noted within the 2018/2019 survey results (see **Section 5.3**), the hardstand surrounding the manufacturing facility in the north of the site means that it is difficult to track mammals there. In any case, this area is considered to be largely unsuitable for most mammal species, with the possible exception of rodents.

No new mammal species were identified for the 10-km squares of N74 and N75, as part of the most recent data search on the NBDC website (August 2023).

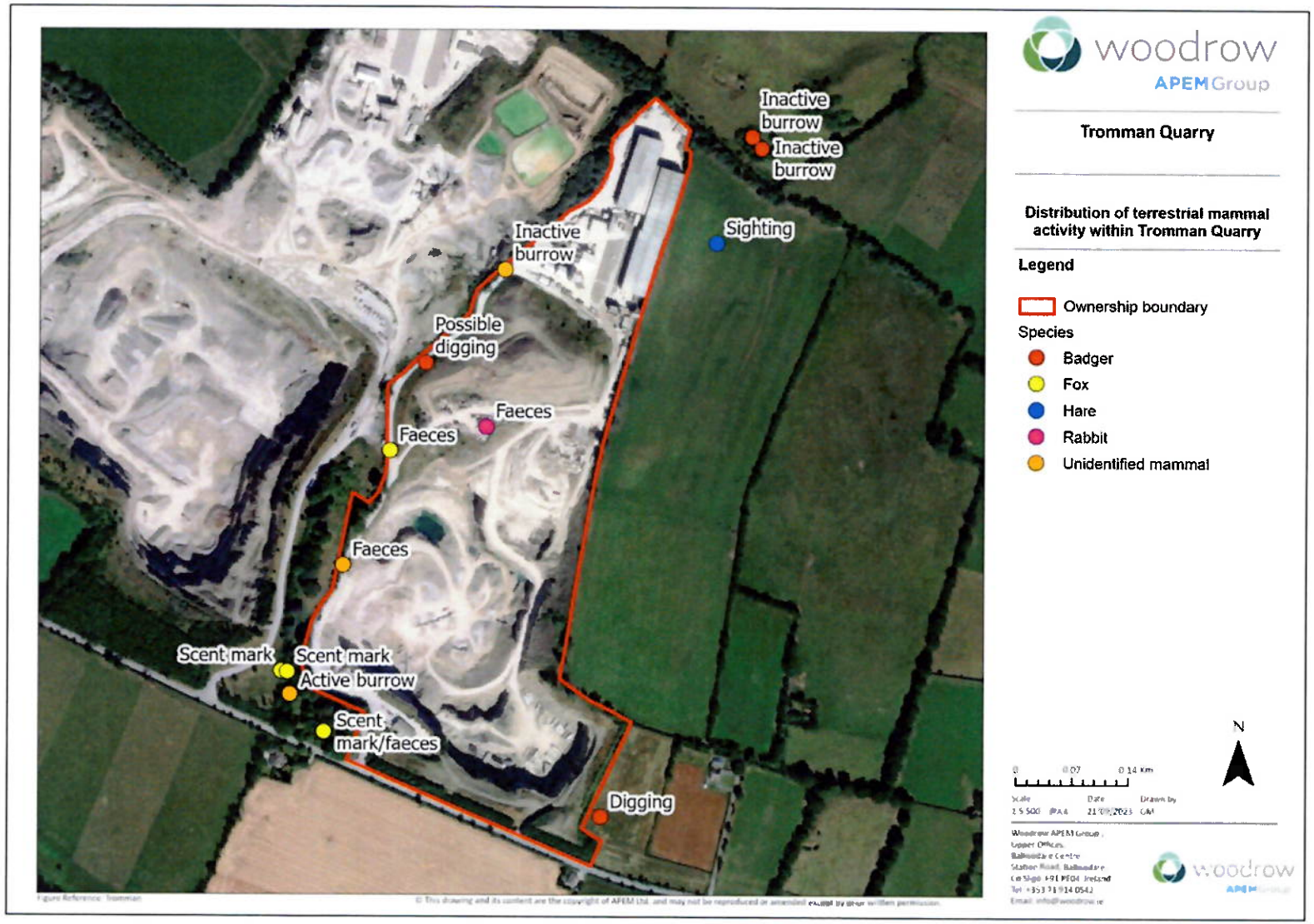


Figure 8. Distribution of terrestrial mammal activity within Tromman Quarry during the surveys performed in 2023.

5.4.2 Bats

As before, the most recent suitability index on NBDC maps (Lundy *et al*. 2011) scored the 5 km x 5 km squares surrounding the quarry as holding habitats of moderate suitability for bats. The scores for each bat species (according to NBDC) are shown below in **Table 4**.

Table 4. NBDC habitat suitability for bat species.

Species	Suitability index	Suitability Index
All bats	**28**	**Moderate**
Soprano pipistrelle	40	Very high
Common pipistrelle	46	Very high
Brown long-eared bat	35	High
Lesser horseshoe bat	0	Very low
Leisler's bat	43	Very high
Whiskered bat	13	Low
Nathusius' pipistrelle	10	Very low
Natterer's bat	33	High

Bat surveys were undertaken on 01 August 2023 by means of five deployed static bat detectors. The locations of the bat detectors deployed are shown in **Figure 9** and the number of passes by each species at the detector locations are shown in **Table 5**. Five species of bat were detected as part of the 2023 surveys, which is the same number of species and the same assemblage of bats recorded in 2019.

Potential roosts within the site were notably scarce, with one moderately sized dead tree covered in ivy (see **Plate 3**) being the only main option. Additionally, the abandoned gate lodge situated in the small southern woodland offered some limited suitability as a roost (see **Plate 4**). A few other trees with ivy cover and occasional older specimens providing deadwood and knots were also present. However, akin to the findings in 2019, the majority of these sites were considered to have low suitability due to their limited sheltering capabilities. Nonetheless, it is worth noting that given the moderate foraging potential on the site, there may be an increase in the use of these less suitable sites as satellite roosts.

The red-brick garage positioned in the southeast corner of the site, which underwent examination during the 2019 baseline assessment, has been subsequently demolished, along with *c*. 60 m of non-native beech hedgerow. An emergence survey conducted at this location in 2019 found no bats emerging from the building.

Table 5. Bat species recorded at Tromman Quarry during the August 2023 deployment.

SM2 unit id number (Habitat feature)	Number of bat passes	Species recorded
WSS-063 (Next to the quarry with a semi-mature and mature broadleaf treeline)	3660	Brown long-eared bat (1) Common pipistrelle (1945) Soprano pipistrelle (444)

SM2 unit id number (Habitat feature)	Number of bat passes	Species recorded
		Leisler's bat (1259) *Myotis* sp. (11)
WSS-028 (Open area next to the top of the spoil heap in the northwest area of the quarry)	1642	Common pipistrelle (626) Soprano pipistrelle (168) Leisler's bat (833) *Myotis* sp. (8) Brown long-eared bat (7)
WSS-051 (On a linear feature alongside stream vegetation.)	7517	Common pipistrelle (4675) Soprano pipistrelle (1878) Leisler's bat (925) *Myotis* sp. (23) Brown long-eared bat (16)
WSS-069 (Next to the road, on the quarry's house gate)	4298	Common pipistrelle (2785) Soprano pipistrelle (811) Leisler's bat (627) *Myotis* sp. (26) Brown long-eared bat (48)
WSS-077 (On a lone immature sycamore situated on quarry cliff to the south, with treeline 30m to the west)	2144	Common pipistrelle (1480) Soprano pipistrelle (249) Leisler's bat (384) *Myotis* sp. (13) Brown long-eared bat (18)

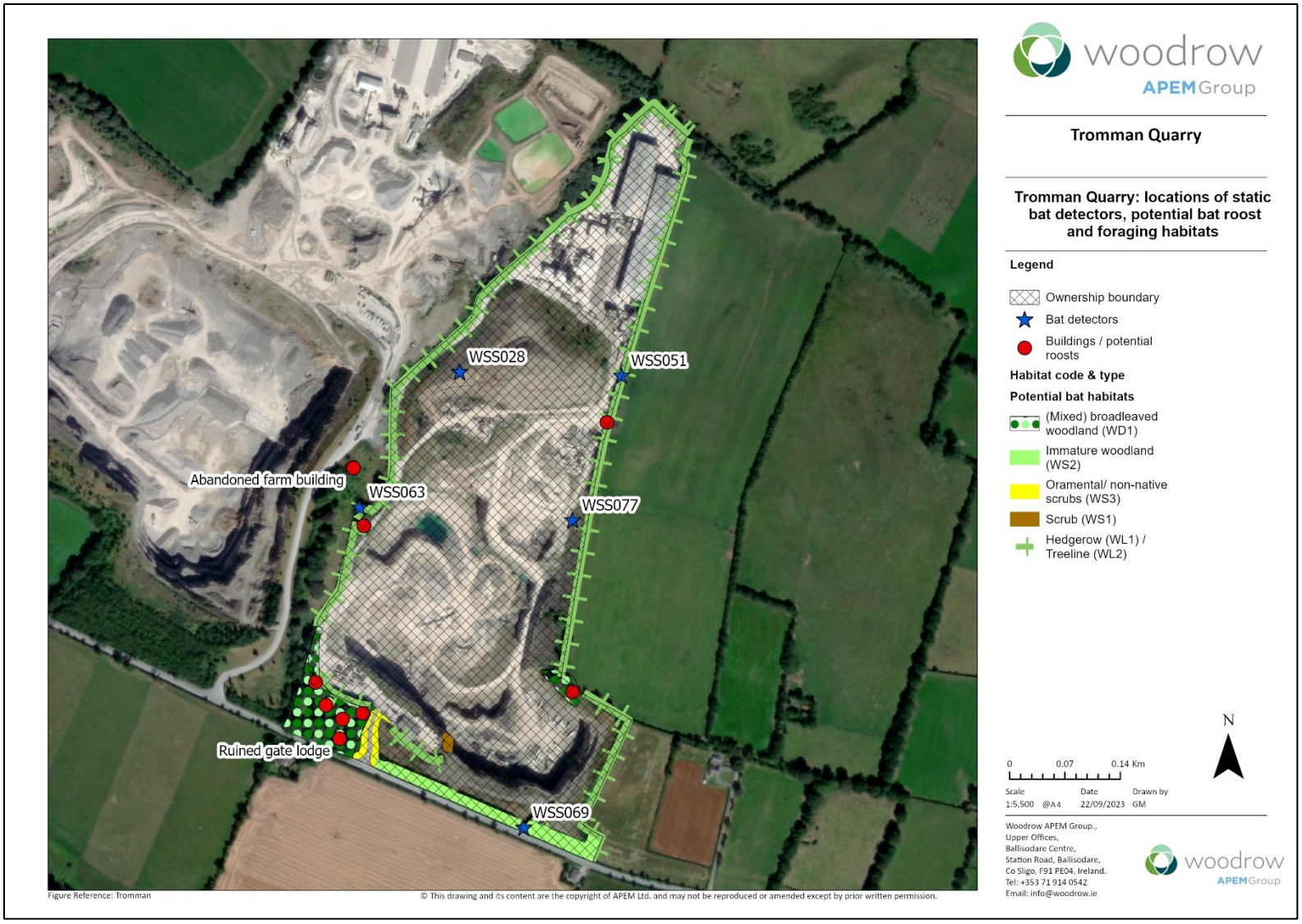


Figure 9. Tromman Quarry - location of static bat detectors (August 2023) and locations of potential bat roost and foraging habitats identified as part of the 2023 surveys.

Plate 3. Dead tree with ivy located along the eastern boundary, considered to be of moderate roosting suitability.

Plate 4. Abandoned gate lodge of low roosting suitability.

5.4.3 Birds

Two bird surveys were undertaken at the site during the 2023 site visits, occurring on 12 July and 03 August, respectively. As these dates fell outside the optimal survey period for breeding birds (April to June), it was more challenging to identify what birds may have been breeding on-site, given that some species may have moved on, and typical breeding behaviour (e.g. singing) is not usually exhibited outside this timeframe. Nonetheless, when consulting the 2023 data in conjunction with the breeding bird data recorded in 2018, it is possible to deduce what birds are likely to have been breeding within the site and its environs over this time.

A full list of the birds recorded in and around the site as part of the 2023 surveys, including their current conservation status (BoCCI4: 2020-2026) (Gilbert *et al*., 2021)[15] are provided in **Table 6**. As before, birds recorded during the 2023 site visits were mostly common, widespread species, and typical for the habitat available within the site. In order to assess whether there was any change in the bird assemblage since the previous baseline assessment, **Table 6** also provides a list of the birds that were recorded in 2018/2019 along with their current BoCCI status.

Again, yellowhammer, which were the only red-listed species recorded on this occasion, were observed calling from a hedgerow to the south-east of the quarry. This area is in close proximity to the cereal fields that are on the periphery of the site, and as such, yellowhammer are likely to be using the hedgerows around the site for nesting. One peregrine falcon, which is an Annex I species under the EU Birds Directive, was observed commuting across the neighbouring quarry (Kilsaran) but was not exhibiting any territorial behaviour. Raven were frequently recorded flying over the quarry and are likely to have been using some of the quarry faces for nesting.

[15] Gilbert, G., Stanbury, A., & Lewis, L. (2021). Birds of Conservation Concern in Ireland 2020 –2026. *Irish Birds* 43: 1—22.

There were also a number of amber-listed species recorded on-site, and which have the potential to breed within the site and its environs. These included spotted flycatcher, swallow, goldcrest, starling and tree sparrow (*Passer montanus*). Other species like buzzard (*Buteo buteo*) and sparrowhawk (*Accipiter nisus*) were mostly associated with pockets of woodland and farmland to the east of the site but are likely to still use the quarry for hunting and foraging. Overall, there were less species recorded during the 2023 surveys, however it is noted that some species (e.g. warblers) would be less likely to exhibit breeding behaviour at the time of surveying, and as a result, may have been unintentionally missed.

Table 6. Bird species recorded at Tromman Quarry in 2023, with records from the 2018/2019 visits also shown for comparison.

BTO Code	Common Name	Scientific Name	2023	2018/2019
Red-listed species *are those which are of highest conservation concern where the population is rapidly declining in abundance or range, has experienced a historic rapid decline (without recovery) or are globally threatened.*				
Y	Yellowhammer	*Emberiza citrinella*	x	x
MP	Meadow pipit	*Anthus pratensis*		x
Amber-listed species *are those with unfavourable European status, occur in internationally important numbers or are moderately declining in abundance or range. May also be Amber-listed if population occurs in very small numbers.*				
GC	Goldcrest	*Regulus regulus*	x	x
HM	House martin	*Delichon urbicum*		x
HS	House sparrow	*Passer domesticus*		x
LB	Lesser black-backed gull	*White-headed Gulls*		x
LI	Linnet	*Carduelis cannabina*		x
SM	Sand martin	*Riparia riparia*		x
SF	Spotted flycatcher	*Musciapa striata*	x	x
SG	Starling	*Sturnus vulgaris*	x	x
SL	Swallow	*Hirundo rustica*	x	x
TS	Tree sparrow	*Passer montanus*	x	
WW	Willow warbler	*Phylloscopus trochilus*		x
Green-listed species *are not considered threatened.*				
B	Blackbird	*Turdus merula*	x	x
BC	Blackcap	*Sylvia atricapilla*	x	x
BT	Blue tit	*Cyanistes caeruleus*	x	x
BZ	Buzzard	*Buteo buteo*	x	
CH	Chaffinch	*Fringilla coelebs*	x	x
CC	Chiffchaff	*Phylloscopus collybita*		x
CT	Coal tit	*Periparus ater*		x

BTO Code	Common Name	Scientific Name	2023	2018/2019
FP	Feral pigeon	*Columba livia f. domestica*		x
GO	Goldfinch	*Carduelis carduelis*	x	x
GT	Great tit	*Parus major*	x	x
HC	Hooded (grey) crow	*Corvus cornix*	x	x
JD	Jackdaw	*Corvus monedula*		x
LT	Long-tailed tit	*Aegithalus caudatus*	x	
MG	Magpie	*Pica pica*	x	x
MT	Marsh tit	*Poecile palustris*		x
PE	Peregrine	*Falco peregrinus*	x	x
PW	Pied wagtail	*Motacilla alba yarrellii*		x
RN	Raven	*Corvus corax*	x	x
R	Robin	*Erithacus rubecula*	x	x
RO	Rook	*Corvus frugilegus*		x
ST	Song thrush	*Turdus philomelos*		x
SH	Sparrowhawk	*Accipiter nisus*	x	
TC	Treecreeper	*Certhia familiaris*	x	
WH	Whitethroat	*Sylvia communis*		x
WP	Woodpigeon	*Columba palumbus*	x	x
WR	Wren	*Troglodytes troglodytes*	x	x

5.4.4 Reptiles and amphibians

Given that the previous baseline assessment of 2018/2019 found the site to be largely unsuitable for reptiles and amphibians (with the exception of common frog), there were no targeted surveys performed as part of the 2023 site visits.

5.4.5 Flora and habitats

A site walkover performed on 10 August 2023 sought to provide an update to the habitats on-site. The findings from this survey found that the majority of habitats comprised those already described as part of the 2018 walkover (see **Section 5.3**). Rather than reiterate their descriptions, **Table 7** provides a list of habitats that remain present on-site, while **Figure 10** delineates the extent of these habitats. Exceptions to this, are any new habitats that were identified on-site, as well as those deemed to have expanded or reduced in extent.

No rare plants listed under the Flora (Protection) Order, 2022 (S.I. No. 235 of 2022) were located within Tromman Quarry during the 2023 habitat survey, nor were there any such records found on the NBDC database.

Table 7. Habitats occurring within Tromman Quarry during the site visit performed in 2023. Habitat classification is in accordance with Fossitt (2000).

Habitat Category	Code	Habitat Classification	Present in 2018 (Y/N) *
Lakes and ponds	FL8	Other artificial lakes and ponds	Y
Watercourses	FW4	Drainage ditches	Y
Improved grassland	GA2	Amenity grassland (improved)	Y
Semi-natural grassland	GS2	Dry meadows and grassy verges	N
Scrub / transitional woodland	WS1	Scrub	Y
	WS2	Immature woodland	Y
	WS3	Ornamental / non-native scrub	Y
Linear woodland / scrub	WL1	Hedgerows	Y
	WL2	Treelines	Y
Disturbed ground	ED2	Spoil and bare ground	Y
	ED3	Recolonising bare ground	Y
	ED4	Active quarries and mines	Y
Built land	BL2	Earth banks	Y
	BL3	Building and artificial surfaces	Y

*Denotes whether the habitat was also present during the 2018 walkover

GS2 - Dry meadows and grassy verges

This habitat, which exclusively occurs in the south of the site (see **Figure 10**), and which had been previously classified as recolonising bare ground (ED3), is now dominated by tall, coarse grasses such as false oat-grass (*Arrhenatherum elatius*) and Yorkshire fog (*Holcus lanatus*), as well as bents (*Agrostis* spp.). While still containing certain species indicative of ED3 habitat (e.g. dandelion (*Taraxacum* spp.), willow-herb (*Epilobium* sp.)), it also contains species such as bush vetch (*Vicia sepium*).

ED2 - Spoil and bare ground

There has been a reduction in the area of spoil and bare ground (ED2) within the south-east and centre of the site, which is largely due to recolonisation from vegetation (ED3).

ED3 - Recolonising bare ground

Some areas that were previously mapped as recolonising bare ground (ED3) have seen a reduction in range, and in certain places have transitioned to dry meadows and grassy verges (GS2). This is most evident in the south of the site, between the main site entrance and the offices of Keegan Quarries Ltd. On the contrary, small areas of habitat previously classified as ED2 have now been recolonised by vegetation (> 50 % cover), that include docks (*Rumex* sp.), nettle (*Urtica dioica*), colts foot (*Tussilago farfara*), and silverweed (*Potentilla anserina*). This is most evident in the centre of the site at the base of the spoil heap in the centre of the site, as well as in the south-east of the site next to the earth banks (BL2), where ground had been stripped.

ED4 - Active quarries and mines

Although the majority of the site is an active quarry, there has not been any further lateral expansion of the quarry beyond its previously permitted limits. Hence, extractive operations have been concentrated within the lower benches of the quarry, with the quarry face moving in a southerly direction.

BL3 - Buildings and artificial surfaces

Demolition of the modern red-brick garage in the south-east of the site, and the removal of artificial surface near the spoil heap in the middle of the site, has resulted in an overall reduction in the amount of built land (BL3) within the quarry.

5.4.6 Invasive species

Figure 11 shows the distribution of non-native and potentially invasive plant species recorded within Tromman Quarry as part of the 2023 site visits. Similar to the 2018/2019 findings, there were no plant species recorded that are included on the Third Schedule of Regulations 49 and 50 (not yet in effect) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).

Traveller's-joy (*Clematis vitalba*), butterfly bush (*Buddleja davidii*), and snowberry (*Symphoricarpos albus*) were observed in a number of areas, with the latter restricted to the woodland bordering the site. Montbretia (*Crocosmia* X *crocosmiiflora*) was found near the spoil heap at the northern end of the site. Additionally, butterfly bush has spread to other parts of the site, particularly around the northern spoil heap. *Cotoneaster* spp., classified as a medium impact invasive (NBDC), were also recorded.

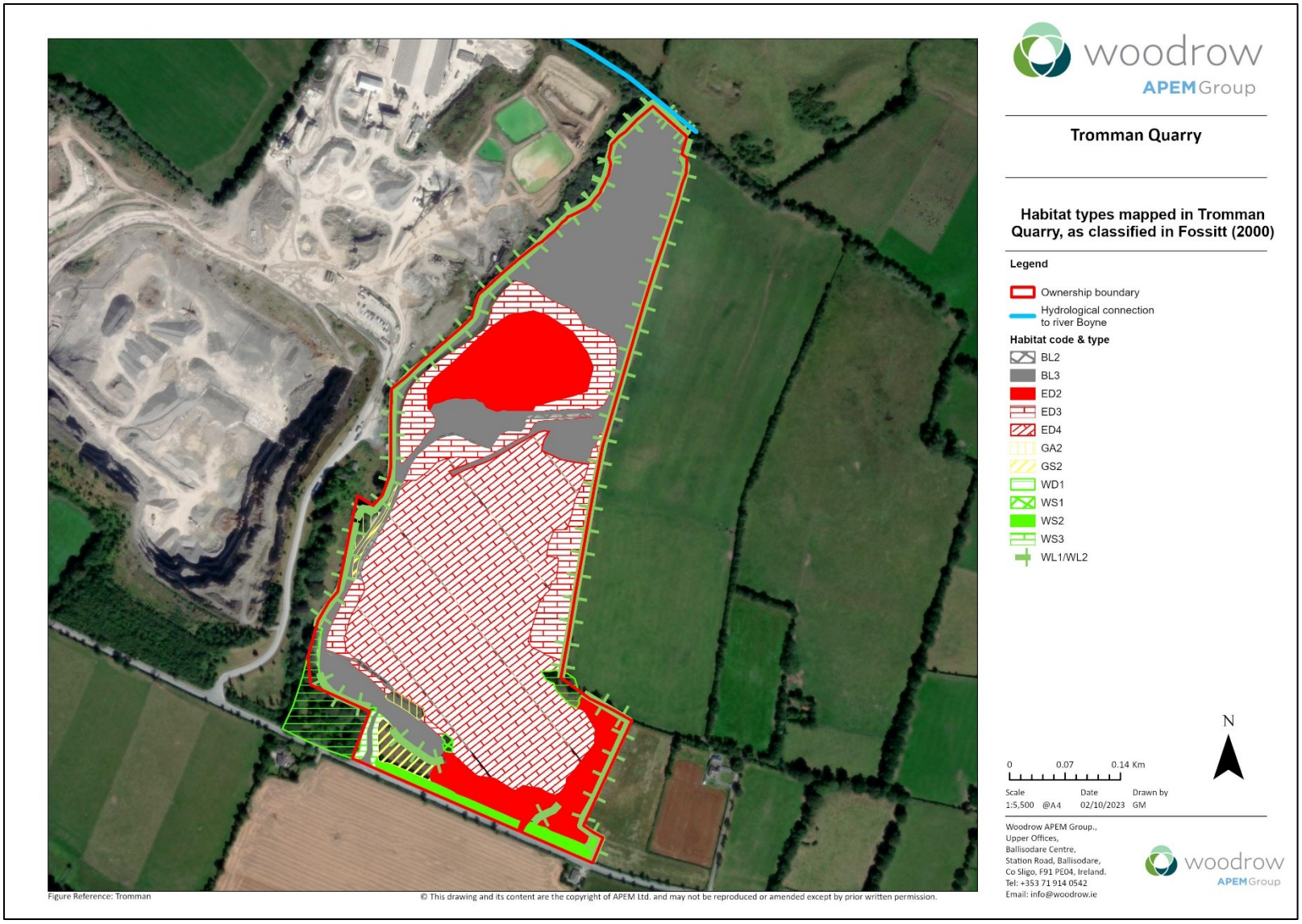


Figure 10. Habitat types mapped in Tromman Quarry as of 2023 and classified according to Fossitt (2000).

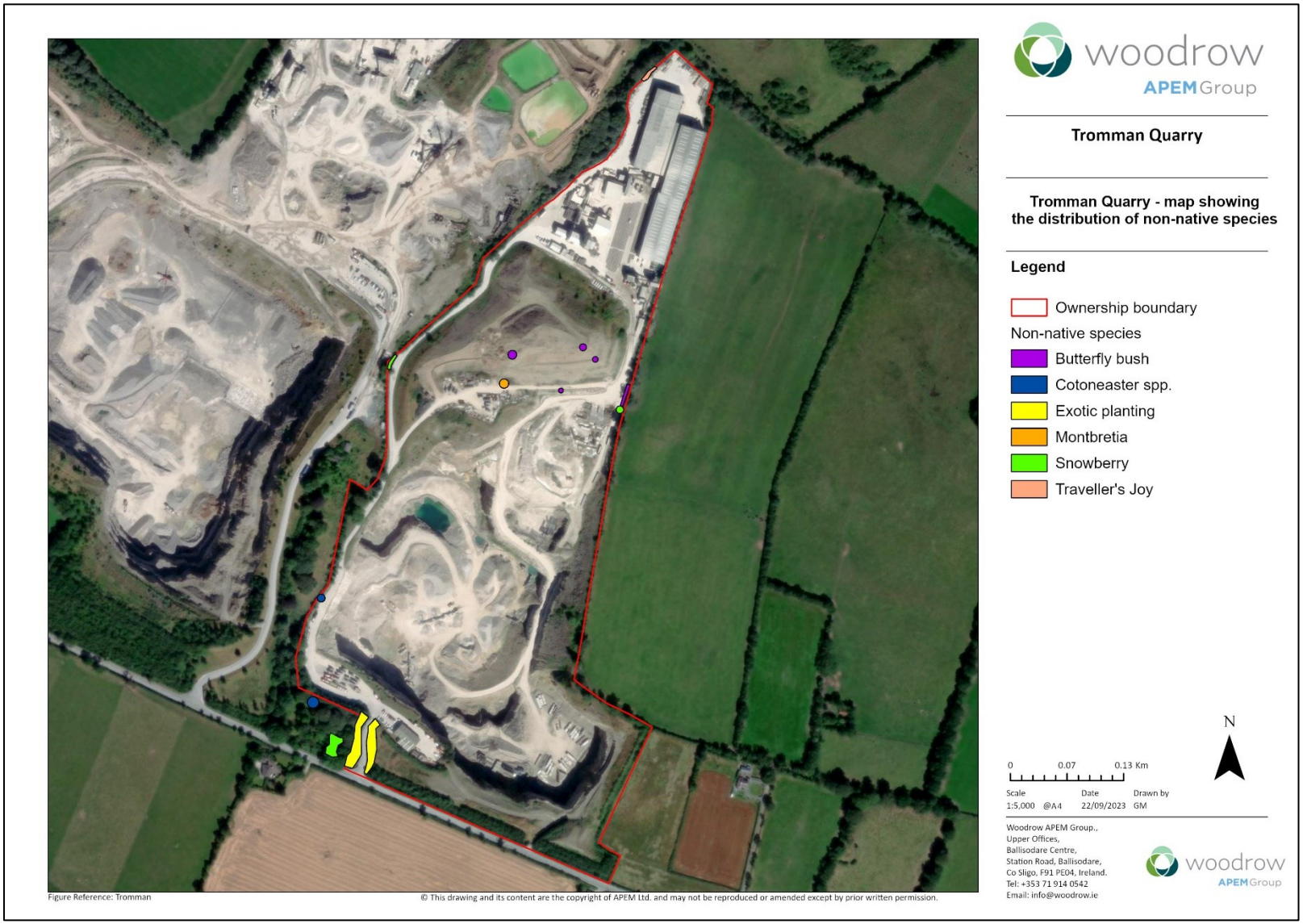


Figure 11. Tromman Quarry - map showing the distribution of non-native species recorded during the 2023 site visits.

6 EVALUATION OF IMPORTANT ECOLOGICAL FEATURES WITHIN THE ZONE OF INFLUENCE

This section provides a value assessment of the habitats and species within the ZoI of the proposed development, based on survey results and following the geographic evaluation methodology. It forms the basis of the impact assessment in the following section.

6.1 Evaluation of Designated Sites within the Zone of Influence

6.1.1 European Sites within the zone of influence of the development

Neither the pre-cast concrete manufacturing facility or the quarry lie within, or immediately adjacent to, any European site. The River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA are hydrologically linked to the development via a drain and lie approximately 10 km downstream by hydrological connection.

Evaluation: International Importance

6.2 Evaluation of Important Habitats within the Zone of Influence

This evaluation covers the development as a whole, with * denoting habitat evaluations which apply to the 2013 baseline (unauthorised development of plant and structures to include pre-cast concrete manufacturing facility)

6.2.1 FL8 Other artificial lakes and ponds *

Anthropogenic habitat of low conservation and ecological value that is subject to high levels of disturbance. It includes settlement ponds that are fenced, vertical-sided concrete tanks, as well as the water that gathers at the base of the quarry, which is subject to continuous pumping operations (dewatering) and only forms temporary water bodies in the operational sump, containing heavy sediment loads.

Evaluation: Local Importance (Lower Value)

6.2.2 FW4 Drainage ditches *

A variety of drains on the periphery of the site offer only limited habitat for aquatic species and wildlife corridors due to their current low flow (or lack of flow).

Evaluation: Local Importance (Lower Value)

6.2.3 GA2 Amenity grassland

Some small patches that support a range of broadleaved herbs and wild flowers, which in turn provide foraging habitat for invertebrates.

Evaluation: Local Importance (Lower Value)

6.2.4 GS2 Dry meadows and grassy verges

There is a small area of this habitat located in the south of the site that appears to have transitioned from recolonising bare ground (ED3). This habitat may provide connectivity for commuting mammals, and offer cover for certain bird species, not to mention invertebrates.

Evaluation: Local Importance (Higher Value)

6.2.5 WD1 (Mixed) broadleaved woodland

A small block of woodland on the periphery of the site is a vestige of a more garden / parkland type habitat, with a high proportion of non-native trees and remnant hedgerows. The ground storey was relative diverse in places, although non-native species (e.g. snowberry) were found to be a prominent feature in parts. These areas offer a nesting and foraging habitat for birds. Although assessed as having a negligible to low potential for roosting bats, this habitat offers a feature for foraging bats, as well as a wildlife corridor for other species.

Evaluation: Local Importance (Higher Value)

6.2.6 WS1 Scrub

Scrub cover within this site is relatively young resulting in a patchy and sparse coverage dominated by gorse, bramble, and willow. These patches are not species rich but offer some cover and limited foraging habitat for mammals and suitable nesting locations for breeding birds.

Evaluation: Local Importance (Higher Value)

6.2.7 WS2 Immature woodland

A screening belt (*c*. 10 m wide) of predominately broadleaved varieties incorporating a mix of native and non-native species. Although assessed as having no roosting potential for bats, it provides a wildlife corridor, a feature for foraging bats and dense nesting cover for birds.

Evaluation: Local Importance (Higher Value)

6.2.8 WS3 Ornamental / non-native scrub

Ornamental shrubbery planted at the site entrance, with some exotic flowers possibly providing a food source for invertebrates.

Evaluation: Local Importance (Lower Value)

6.2.9 WL1 Hedgerows *

Almost the entire outer perimeter of the site is demarcated with hedgerows. The age and condition of the hedgerow varies from some more recently planted hedging along the western boundary to older remnant hedgerows taking on the characteristics of WL2 treelines. This habitat provides an important feature for foraging bats, as well as a wildlife corridor and nesting / foraging habitat for birds.

Evaluation: Local Importance (Higher Value)

6.2.10 WL2 Treelines *

Many of the hedgerows along site boundary are not heavily managed and are developing into treelines. Similarly, these provide a feature for foraging bats, a wildlife corridor as well as nesting / foraging habitat for birds. These contained Ivy clad trees that were mostly assessed as having negligible to low potential for roosting bats.

Evaluation: Local Importance (Higher Value)

6.2.11 ED2 Spoil and bare ground

These areas are the result of quarrying activity, are not species rich and are typically subject to high levels of disturbance due to the temporary nature of spoil heaps [redacted]

Evaluation: Local Importance (Lower Value)

6.2.12 ED3 Recolonising bare ground

Some of these areas exhibit greater species richness than others, however they are not generally considered to be of notable ecological value.

Evaluation: Local Importance (Lower Value)

6.2.13 ED4 Active quarries and mines

Anthropogenic habitat that has the potential to offer a range of habitats for protected species (e.g. spoil heaps for badger setts, exposed earth for mining bees and sand martins, settlement ponds for newts, cliff faces for nesting birds like peregrine falcon). However, at stages of interest (i.e. 2013, 2018 and 2023) the quarry was considered to have a relatively low intrinsic value for wildlife. This is likely, to change once remedial works start to take place.

Evaluation: Local Importance (Lower Value) becoming (Higher Value)

6.2.14 BL2 Earth banks

Traditional boundary banks can be hundreds of years old, representing relatively undisturbed habitat with an agricultural landscape, offering suitable cover and protection for smaller fauna (e.g. invertebrates, amphibians, reptiles, birds and rodents) and also supports bryophytes and lichens. As such, they are considered to be of ecological value in the landscape.

Evaluation: Local Importance (Higher Value)

6.2.15 BL3 Buildings and artificial surfaces *

Anthropogenic habitat of low conservation and ecological value that is subject to high levels of disturbance. Buildings can potentially offer nest sites for birds and roosts for bats, and these features can be enhanced by erecting nest boxes and bat boxes.

Evaluation: Local Importance (Lower Value)

6.3 Evaluation of Fauna within the Zone of Influence of the Development

6.3.1 [redacted]

[redacted]

The 2018/2019 surveys revealed a suspected fox located within impenetrable scrub on upper slopes of an old quarry face, while what appeared to be an active fox den was also found in the woodland outside the southern boundary in 2023. One old pine marten scat was located as part of this same survey, on a boulder along the road leading to the manufacturing facility. However, it was considered that this most likely originated from an individual commuting through the site.

The small blocks of woodland, hedgerows, treelines and scrub do offer some cover for mammals, and some of the plant species found on the site may provide a source of food e.g. brambles. The northern part of the site occupied by the manufacturing facility was assessed as being of limited value to mammals. The small waterbodies on the periphery of the site could be periodically utilised by otters.

Evaluation: Local Importance (Higher Value)

6.3.2 Bats

Bat surveys conducted in June 2019 and August 2023 recorded a minimum of five species of bat. These comprised brown long-eared bat (*Plecotus auratus*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Leisler's bat (*Nyctalus leisleri*) and *Myotis* species.

NBDC records indicate that Nathusius' pipistrelle (*Pipistrellus nathusii*), Daubenton's bat (*Myotis daubentonii*) and Natterer's bat (*Myotis nattereri*) also occur within the 10-km squares covering the site. Interestingly, whiskered bat (*Myotis mystacinus*) was noted as being resident in environmental documentation for the adjoining quarry (Kilsaran).

Given the habitat types available on the site, which consist of small blocks of relatively open broadleaf woodland, hedgerows, treelines, buildings and small water courses, it is considered that bats will mainly utilise the area for foraging and commuting. The availability of suitable roosting sites was assessed as negligible to low.

All bat species including the species listed above, are protected under Annex IV of the Habitats Directive.

Evaluation: Local Importance (Higher Value)

6.3.3 Birds

Only two red-listed (meadow pipit and yellowhammer) and 10 amber-listed species of conservation concern (BoCCI4) were recorded over the two survey periods, with four of these species noted to exhibit breeding behaviour as part of the 2018/2019 surveys, and a further five noted as having the potential to breed at the site. The small watercourses on the periphery of the site could be periodically utilised by foraging kingfisher, a species listed on Annex I of the EU Birds Directive and an SCI of the River Boyne and River Blackwater SPA.

Of the species recorded, only peregrine falcon are listed under Annex I of the EU Birds Directive, and although exhibiting territorial behaviour was observed in the area during the 2018/2019 visits, a breeding site within the quarry was not confirmed. Alternatively, peregrine observed commuting over the area during the 2023 survey, suggests that the species may be nesting in the adjoining quarry belonging to Kilsaran. Peregrine along with raven, jackdaw and feral pigeon were the only species typically benefiting from quarrying activities that were noted as breeding or potentially breeding at the site. While sand martin were present, no breeding colonies were identified, and birds were thought to be nesting within the adjacent quarry.

Overall, the range of bird species noted to date, for both the manufacturing facility (no cliff faces) and the site as whole are considered to be typical for the habitats present within the environs, with some red and amber BoCCI listed species occurring (Gilbert *et al*., 2021). However, all of the species noted are considered common and widespread throughout Ireland, and as such, are considered in the context of this site to be of relatively low conservation value.

All breeding bird species are protected under the Wildlife Act, 1976 and the Wildlife (Amendment) Act, 2000.

Evaluation: Local Importance (Higher Value)

6.3.4 Reptiles and amphibians

The only reptile or amphibian records for the 10-km squares (NBDC) covering Tromman Quarry were for common frog (*Rana temporaria*). There is some limited potential for reptiles and amphibians to forage or take cover on the site (e.g. within scrub or old stone walls). However, there is limited suitable open habitat on the site, such as rough grassland for lizards. In addition, the water features within the site were considered as low quality for breeding amphibians. As such, the habitats on the site are considered to be of low value for Herpetofauna populations.

***Evaluation*:** Local Importance (Lower Value)

6.4 Important Ecological Features within the ZoI

Table 8 below summarises the Important Ecological Features within the ZoI of the development.

Habitats and species which have been assessed to be of Local Importance (Higher Value) or above within the application site, have been listed as Important Ecological Features as shown in **Table 8** below. This evaluation covers the development as whole.

Table 8. Important Ecological Features and their evaluation.

Important Ecological Feature	Evaluation
Designated Areas	
River Boyne and River Blackwater SAC River Boyne and River Blackwater SPA	International Importance
Habitat	
GS2 Dry meadows and grassy verges	Local Importance (Higher Value)
WS1 Scrub	Local Importance (Higher Value)
WS2 Immature woodland	Local Importance (Higher Value)
WL1 Hedgerows	Local Importance (Higher Value)
WL2 Treelines	Local Importance (Higher Value)
BL2 Earth banks	Local Importance (Higher Value)
Species	
[redacted]	[redacted]
Bats (commuting & foraging)	Local Importance (Higher Value)
Birds	Local Importance (Higher Value)

Invasive Alien Species (IAS) are considered within the impact and mitigation sections below.

7 IMPACT ASSESSMENT OF IMPORTANT ECOLOGICAL FEATURES WITHIN THE ZONE OF INFLUENCE

The methodology set out in **Section 1** is applied to Important Ecological Features, which have been identified and described in **Section 5** and evaluated in **Section 6**.

The Planning and Development Act (as amended) instructs under Section 177(F)(1), that the potential impacts on designated areas, habitats and species are considered under the three phases of the development, including:

1. Impacts which have occurred;
2. Impacts that are occurring;
3. Impacts that can reasonably be expected to occur.

7.1 Impacts that have Occurred

In terms of the legislative requirements with respect to SC, it is considered that with reference to the assessment of the environmental impacts that have occurred, the appropriate period for consideration is from 2013 to present. This is the period when the pre-cast manufacturing structures in the northern part of the site and other ancillary developments were erected. Within this period, it is also necessary to consider the period from 04 August 2018, the time at which quarrying became unauthorised, to present.

The following impact sources have been judged as having had the potential to arise over the baseline periods (2013 to August 2018; August 2018 to 2023). These pertain to the construction and operation of the pre-cast concrete manufacturing facility in the north of the site, as well as continued quarrying activities across the entire site.

7.1.1 Construction of manufacturing facility – impact type / sources

Contamination of surface water / groundwater

Without mitigation, chemicals and materials stored and used on the site during the construction of the shed (such as fuel, oils, cement, sand, aggregate and concrete); as well as material exposed during excavation works, could have resulted in the contamination of surface water runoff and consequently resulted in the degradation of water quality in the vicinity of the site.

Without mitigation, spillages could have occurred during the pouring of concrete foundations and/or during routine plant maintenance, improper storage and/or accidental spillages of hydrocarbons during the construction works. Contaminants being washed into nearby watercourses could lead to a serious impact on water quality within the locality, subsequently effecting the freshwater habitats and species present. In the context of this site, without proper control measures, contaminants are likely to enter the stream along the northern boundary (Rathmolyon Stream), which is hydrologically linked, albeit distantly (*c*. 10 km) to the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA.

At the time of construction, the concrete manufacturing area was already fully paved and considered an impermeable surface, thus eliminating the risk of contamination to groundwater in the vicinity of the works. Moreover, the surface type and gradient was unchanged by the introduction of these manufacturing facilities, and hence they did not impact upon factors influencing rainfall runoff or drainage (BCL Consultant Hydrogeologists Ltd., 2023). In addition,

ongoing control measures to mitigate against contamination of surface waters, including the construction of a surface water and groundwater management system, have been in place since 2009 (see Environmental Management System EMS produced by Byrne Environmental Consulting Ltd.). In relation to protecting groundwater and surface water within the Keegan Quarry site as a whole, the EMS states:

> *The following general guidelines have been considered in designing an effective surface water management system for the site.*
>
> - *Solid inert waste will be disposed of by licensed removal from the site or by recycling on the site in a designated inert waste recycling location and in a manner that will not impact on surface waters.*
> - *Fuels, lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment in the designated storage location. Drip trays, mobile bunds and permanent bunded areas will be installed to minimize the potential for pollution of surface water bodies.*
> - *Fuelling and lubrication of vehicles and mobile plant and equipment will not be carried out close to water courses and will be conducted on concrete surfaced areas.*
> - *All refill points for fuels, lubricants, hydraulic fluids or any other hydro-carbon based liquids will be located in a hardstanding bunded area.*
> - *Any spillage of fuels, lubricants of hydraulic oils will be immediately contained and any contaminated soil removed from the site and properly disposed of by an appropriately licensed contractor.*
> - *Foul drainage from site offices, canteen and toilets will be discharged to the biocycle system and percolation area.*
> - *All concreted surfaces used for refuelling will be drained to a petrol/oil interceptor unit.*
> - *Sites for use as storage areas, machinery depots, site offices, internal haul roads or the disposal of spoil will be located as far as is practicable from watercourses.*
> - *All surface water collected on-site shall be diverted to the surface water settlement pond prior to discharge via a petrol/oil interceptor to surface water.*
> - *No water shall be pumped from the quarry without passing through the settlement pond system*
> - *The settlement lagoons shall be inspected weekly by the Site Manager and all settled solids shall be removed by pumping as required to ensure the capacity and efficiency of the lagoons is maintained at all times.*
>
> *Absorbent materials such as absorbent booms and vermiculite will be held on-site and any spillages of organic liquids such as oils, greases etc will be contained and cleaned up immediately. The contaminated absorbent material will be correctly stored in a designated area on-site prior to being collected and disposed of by an approved contractor.*
>
> *All accidental discharge incidents shall be immediately reported to the environment department of Meath County Council by the Quarry Manager.*

On the basis that the mitigation measures outlined in the EMS were adhered to in full, and all surface runoff was collected in the settlement lagoons (latterly newly constructed tanks 2016/2017) for discharge via the consented discharge point (as covered by Trade Effluent

Discharge Licence Ref. 04/2), the risk of local surface water and groundwater becoming contaminated as a result of construction activities is considered to have been low.

Disturbance of foraging / breeding sites

Without mitigation, there was potential for construction activities to result in the disturbance of foraging / breeding fauna, particularly birds, utilising the hedgerow/ treeline directly adjacent to the new shed. However, construction commenced after the end of the bird breeding season (September 2016) and was subsequently completed prior to the start of the next breeding season (March 2017). Therefore, it can be definitively concluded that construction did not impact on breeding birds. The potential for disturbance emanating from construction activities to impact on foraging fauna, if any, was short-term given the construction period of approximately six months. The potential disturbance to birds and other fauna foraging in the area during the construction period was assessed as negligible.

7.1.2 Operation of manufacturing facility – impact type / sources

Contamination of surface water / groundwater

Without mitigation, chemicals and materials stored and used on the site during the manufacturing process (such as fuel, oils, cement, sand, aggregate and concrete) could have resulted in the contamination of surface water runoff and consequently resulted in the degradation of water quality in the vicinity of the site.

While the production processes appear highly controlled, spillages could occur during the pouring of concrete into pre-cast moulds, washing of equipment / machinery and/or during routine plant maintenance, improper storage and/or accidental spillages of hydrocarbons. Of particular concern is the potential escape of cement and concrete fragments. If these contaminants are washed into nearby watercourses, it could have a significant impact on water quality within the locality, subsequently effecting the freshwater habitats and species present. As before, without proper control measures, contaminants are likely to enter the stream along the northern boundary of the site, which is hydrologically linked to the River Boyne and River Blackwater SAC and SPA.

Although not specifically referenced in the EMS for Keegan Quarry, it is assumed that control measures outlined for mitigation against pollution to surface water and groundwater (see quoted text above) extended to the operation of the pre-cast concrete manufacturing facility. In relation to the plant, the EMS states:

> *The operation of the precast concrete products plant has a minimal impact on the receiving environment as all manufacturing activities occur within the purpose-built factory unit.*

Therefore, assuming the mitigation measures outlined in the EMS were adhered to in full, and that all surface runoff was collected in the settlement lagoons (latterly newly constructed tanks 2016/2017) for discharge via the consented discharge point (as covered by Trade Effluent Discharge Licence Ref. 04/2), the risk of local surface water and groundwater becoming contaminated as a result of on-going concrete manufacturing operations is considered to have been low. This is reflected by the fact that there were no reported incidents during this monitoring period.

Shading of habitats by the new shed

The 2016/2017 expansion of the pre-cast manufacturing unit (the new shed) has resulted in increased levels of afternoon shading along the eastern boundary of the site. This has the potential for altering species composition in favour of shade tolerant species, however this is not considered a significant impact.

Dust deposition on flora

While the manufacturing process is enclosed within sheds and as such will not generate dust, the associated activities, such as delivery of materials have the potential to generate dust in the absence of mitigation. Fugitive dust is typically deposited within 100 to 200 m of the source; the greatest proportion of which, comprising larger particles (>30 µm) is deposited within 100 m. Large amounts of dust deposited on vegetation over a prolonged period results in adverse effects on plant productivity, which can lead to degradation of sensitive habitats. Prevailing weather conditions have a bearing on how much dust is generated and deposited, with factors such as rainfall supressing the agitation of dust and may also have a cleansing effect, washing deposits of foliage (UK DoE, 1995).

A review by Farmer (1993) found that dust deposition starts to affect the more sensitive species at levels above 1000 mg/m^2/day, which is significantly higher than the upper limit permitted under the planning conditions for the site – set at 350 mg/m^2/day. To ensure this threshold is not surpassed control measures are employed throughout the site to suppress the generation of dust (see EMS). Ongoing monitoring confirmed that operations consistently operated below the 350 mg/m^2/day guideline figure provided for in the DOEHLG 2004 recommended levels. As such it can be concluded that dust generation relating to operational activities has been adequately controlled and the impact on flora in the vicinity of the quarry is minimal. In addition, there are no sensitive habitats adjacent to the development.

Light pollution impacting on foraging bats

It is likely that the extension of the manufacturing facility, through construction of the shed, has increased the Lux levels on the site and has resulted in illumination of previously unlit areas. Artificial lighting can attract insects, which in turn can attract some faster flying bat species, like Leisler's bat and pipistrelle species, providing a food source for these species and potentially a competitive advantage over more light sensitive bat species. The slower flying species, like Myotis sp. and brown-long eared bats may be displaced from favoured foraging areas or commuting routes by the introduction of artificial lighting. Artificial lighting can also displace roosting bats.

The likelihood of any suitable roost sites in the vicinity of the new shed is low, based on current habitat availability and it has been judged that this has not altered over the baseline period (2013-23). Therefore, the potential for the new lighting regime impacting on roosting bats can be discounted. In terms of habitat availability for foraging bats in the vicinity of the shed, the hedgerow / treeline along the eastern boundary has been highlighted as providing potential foraging habitat and it is possible that light sensitive species may be displaced from this area. However, in the context of substantial areas of similar habitat for foraging bats existing outside of the site, the potential loss of foraging habitat is deemed to be insignificant at a local level.

7.1.3 Quarrying activities – impact type / sources

Contamination of surface water / groundwater

Quarrying activities occurring near water can result in pollution from fuel spillages, oil leakages, and accidents, causing the contamination of surface water runoff and degradation of water quality in the vicinity of the site. Moreover, extraction activities, de-watering and the discharge of water has the potential to alter localised groundwater levels and surface water base flows.

The stripping of vegetation, ground disturbance and the storing of stripped soils, can lead to sediment and pollutants derived from quarrying activities being washed into watercourses during periods of prolonged rainfall or flood events. Associated impacts of this include sedimentation and contamination of watercourses, resulting in ecological implications for freshwater biota downstream of the quarry site. This includes QIs/SCI of the River Boyne and River Blackwater SAC and SPA, which occur *c*. 10 km downstream of the site via hydrological connection.

However, as extraction activities have mainly been focused within the quarry floor in the southern extent of the quarry (with a new face created in the quarry floor), coupled with the fact that the gradient on-site naturally draws water away from the adjoining watercourses situated to the north, then there is not expected to have been any direct surface runoff associated with quarrying activities. As of 2019, data derived from routine monitoring of the quarry discharge point, demonstrated that discharge largely complied with the specified discharge limits set out in the discharge consent (Trade Effluent Discharge Licence Ref. 04/2).

Despite a broad level of compliance, it is important to note some instances where measured values exceeded those limits specified in the consent, particularly in relation to suspended solids (Discharge Effluent Quality Reports provided by Byrne Environmental Consulting Ltd.) (further described in **Section 7.4** below). These incidents, while relatively infrequent, underscore the need for continued vigilance regarding water quality standards, as well as importance of ongoing monitoring.

Habitat loss and fragmentation

The south-eastern quarry expansion, led to the removal of former quarry-top embankment, hedgerows, treelines, improved agricultural grassland, and a house during site preparation. However, these activities occurred within the consented timeframe for quarrying (2011-2017), which was assessed for ecological impacts prior to August 2018. As activities have since been concentrated on the lower benches of the quarry, there has been no direct loss of any sensitive habitat since the August 2018 baseline. An exception to this includes the removal of a garage and some non-native hedgerow that were considered to be of limited ecological value.

Dust deposition on flora

As covered in more detail in relation to the pre-cast concrete manufacturing facility, large amounts of dust deposited on vegetation over a prolonged period results in adverse effects on plant productivity, which can lead to degradation of sensitive habitats. As already noted, monitoring of the site up until 2019, confirmed that operations at the time were consistently operating below the 350 mg/m^2/day guideline figure provided for dust deposition. Thus, assuming that the control measures outlined in the EMS for the control of dust arising from quarrying activities have also been adhered to, then it is considered that the impact on flora in the vicinity of the quarry is minimal.

Disturbance to fauna

Prior to the 2018 baseline being assessed, quarrying activities were already generating ecological disturbance factors including noise, vibration and movement (machinery and human operatives). Since that time, the quarry has not laterally expanded beyond its previously permitted limits with extractive operations concentrating on the lower benches toward the centre of the site, with the faces heading in a generally southern direction. Accordingly, there is considered to have been limited risk of disturbance to fauna associated with the quarry.

7.1.4 Impacts that have occurred on Designated Areas

River Boyne and Blackwater SAC and River Boyne and Blackwater SPA fall within the potential ZoI because of the existing hydrological link and the potential for impact on water quality on the sites, and consequent impact on the QIs and/or SCI.

The rNIS (Woodrow, 2023b) concluded that the distance of the hydrological link to European Sites downstream of the development (*c.* 10 km) in combination with the control measures within the site, mean that there is no potential for adverse impacts on the integrity of the River Boyne and Blackwater SAC or SPA.

7.1.5 Impacts that have occurred on habitats

Aerial imagery shows that hedgerows and treelines on the periphery of the site have been retained throughout the operational phase of pre-cast concrete manufacturing, including the 2016/2017 expansion of the pre-cast manufacturing unit along the eastern boundary of the site. Increased afternoon shading of the hedgerow / treeline along the eastern boundary has occurred due to the construction of the new shed; and while this has the potential for altering species composition in favour of shade tolerant species, it is not considered a significant impact.

In terms of quarrying activities, the majority of site preparatory works occurred during the consented quarrying timeframe of 2011-2017, which was assessed for ecological impacts. No further loss of sensitive habitat has occurred since 2018, owing to the fact that extraction has largely been confined to the lower benches of the quarry. The only exception to this is a small area of non-native beech hedgerow that was removed in the south-east of the site, alongside the garage of a bungalow, which was demolished under prior consent. Replacement planting that occurred along the southern boundary during the consented timeframe, has provided valuable foraging habitat for bats and foraging / nesting areas for birds as well as terrestrial mammals.

Control measures and planning conditions pertaining to the permissible levels of dust generation on-site, will have reduced the amounts of dust that has settled on foliage. Therefore, the impact of dust deposition on foliage is not considered a significant impact.

7.1.6 Impacts that have occurred on fauna

[redacted]

[redacted]

Bats

The linear features on the periphery of the concrete manufacturing site also provide foraging habitat for bats. These features have been retained throughout the operational phase of pre-cast concrete manufacturing. The built environment (concrete hardstanding and sheds) that dominated this area is of limited value for bats. As discussed above, the potential for the new lighting regime to impact on roosting bats was discounted and the potential loss of foraging habitat is deemed to be not significant.

The linear features around the site boundary, together with the relatively open broadleaf woodland, buildings and small water courses around the site, have been mainly utilised by bats for foraging and commuting. The retention of these features throughout the operational phase of the quarry, combined with the replacement planting of the southern boundary in 2012, means that quarrying activities are unlikely to have had any significant impact on bat foraging / commuting activity in the area. The removal of the garage in the south-east of the site is unlikely to have had any impact on bats, given that an emergence survey conducted in 2019, revealed that bats were not using this feature as a roost site.

Birds

The linear features on the periphery of the concrete manufacturing site (i.e. hedgerows / treelines, streams) provide nesting and foraging habitat for birds. These features have been retained throughout the operational phase of pre-cast concrete manufacturing, including the increase in plant and structures to include the 2016/2017 expansion of the pre-cast manufacturing unit along the eastern boundary of the site. The built environment (concrete hardstanding and sheds) that dominated this area is of limited value for birds, with the exception of some species that nest on/in man-made structures. By necessity these species become readily habituated to human activity, including manufacturing. It is not considered that expansion of the processing plant (2016/2017) and on-going manufacturing posed any significant impacts upon the local bird population.

Again, the retention of hedgerows / treelines along the remaining periphery of the site, combined with the replacement planting that occurred along the southern boundary in 2012, has likely benefited birds by continuing to provide nesting / foraging habitat. Although the assemblage of birds recorded in 2023 was slightly less diverse than that of 2018, it remained similar, with the continued presence of red-listed species (i.e. yellowhammer) (BoCCI4: 2020-2026) that were recorded in the south-east of the site. Based on this evidence, it is not considered that quarrying activities had any significant impact on the local bird population between the two baseline periods assessed.

7.1.7 Consideration of mitigation and enhancement measures

This section of the report delineates the mitigation and/or enhancement measures designed to prevent or minimise impacts on Important Ecological Features within the ZoI of the development. This encompasses both the activities of the pre-cast concrete manufacturing facility from 2013-2018 and the quarrying activities that occurred post 05 August 2018.

Without existing mitigation in place, the activities associated with the pre-cast concrete manufacturing facility and quarry operations had the potential to pose a significant impact on a single ecological receptor within the ZoI of the development (i.e. water quality). The EMS for

the site provides the list of mitigation measures to control against contamination of surface water and groundwater, thereby protecting watercourses in the local area (see **Section 7.1.1** relating to the contamination of surface water / groundwater). In addition to providing compliance assurance, continued monitoring of the discharge point has allowed for the implementation of further measures to protect local watercourses and ongoing improvement to the current drainage infrastructure on site. This is highlighted by upgrades that have been provided to the drainage infrastructure in 2023, notably the addition of further settlement facilities along the eastern boundary of the site.

Ongoing operations at the manufacturing facility did not impact on any habitats which remained in the northern part of the site, such as hedgerows, treelines or watercourses. Similarly, as no further expansion of the quarry occurred post 2018, there were not considered to be any impacts on sensitive habitats or fauna associated with continued quarrying activities. One exception to this, is the removal of a garage *c*. 60 m of non-native beech hedgerow that occurred post July 2019. However, these features were deemed to be of generally low ecological value.

No high impact invasive plant species (as listed by NBDC) were recorded during the site visits, nor were there any plant species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011.

7.1.8 Residual impacts and effects on important ecological features

Negative residual impacts are not considered to be ecologically significant.

7.2 Impacts that are Occurring

This section assesses the potential ecological impacts that are currently being experienced at the site at the time of writing in 2023. These include potential ecological impacts arising from pre-cast concrete manufacturing in combination with quarrying activities.

7.2.1 On-going quarry operations – impact types / sources

Contamination of surface water / groundwater

In the context of current quarry operations, and as mentioned in the previous section (see **Section 7.1**), unmitigated activities near water bodies pose the risk of pollution from fuel spillages, oil leaks, and accidents, which could lead to contamination of surface water runoff and degradation of water quality in the site's vicinity.

While extraction activities continue to focus on the lower benches in the southern extent of the quarry, it is crucial to emphasise the importance of implementing mitigation measures to effectively control runoff entering local watercourses. Given that the current mitigation measures outlined in the Keegan Quarries Ltd. EMS remain in place, and discharge from the site is monitored on a regular basis, the risk of pollution to local watercourses and groundwaters is still considered to be low.

Habitat loss and fragmentation

As discussed in **Section 7.1**, all preparatory works for extraction occurred within the consented (previously assessed for ecological impacts) timeframe for quarrying (2011-2017). Thus, there has been no direct loss of habitat resulting from quarrying activities as of the 2023 baseline assessment.

Dust deposition on flora

Large amounts of dust depositing on vegetation over a prolonged period results in adverse effects on plant productivity (as discussed in **Section 7.1** above) and continues to pose risk to sensitive habitats that may be present around the site. However, continued employment of the control measures set out in EMS, is likely to ensure that quarry operations continue to operate below the 350 mg/m^2/day threshold, and as such, minimise the risk of dust depositing on foliage. Additionally, as of 2023, there are no sensitive terrestrial habitats adjacent to the development.

Disturbance to fauna

As the quarry has not laterally expanded and given that quarrying activities were already generating ecological disturbance prior to the 2023 baseline assessment, there is considered to be limited risk of disturbance to fauna within the vicinity of the site.

7.2.2 Impacts occurring on Designated Areas

River Boyne and Blackwater SAC and River Boyne and Blackwater SPA fall within the potential ZoI because of the existing hydrological link and the potential for impact on water quality on the sites, and consequent impact on the QIs and/or SCI.

The rNIS (Woodrow 2023b) concluded that the distance of the hydrological link to European Sites downstream of the development (*c*. 10 km) in combination with the control measures within the site, mean that there is no potential for adverse impacts on the integrity of the River Boyne and Blackwater SAC or SPA.

7.2.3 Impacts occurring on habitats

As the quarry has remained within its previously permitted boundaries and most activities have concentrated on the lower benches within the southern part of the quarry, there are presently no ongoing impacts to any habitat evaluated as an Important Ecological Feature (GS2 Dry meadows and grassy verges; WS1 Scrub; WS2 Immature woodland; WL1 Hedgerows; WL2 Treelines; BL2 Earth banks).

Conversely, the transformation of certain areas of recolonising bare ground (ED3) into dry meadow and grassy verges (GS2) has provided additional foraging and commuting areas, that is likely to benefit terrestrial mammals, birds, and invertebrates.

7.2.4 Impacts occurring on fauna

Bats

The 2023 baseline assessment shows continued use of the site by bats for commuting / foraging. This is largely due to the retention of linear features and woodland, however data collected next to the spoil heap in the centre of the site, also shows that bats (e.g. Leisler's) are also using open areas of the quarry for foraging. Thus, there is not considered to be any significant impacts occurring on bats as a result of quarry operations.

Birds

The available evidence suggests that there are minimal significant impacts to birds on-site due to the preservation of foraging and nesting habitats, including the hedgerows / treelines that demarcate the site, as well as the scrub and woodland that occur within and adjacent to the site boundaries. The presence of yellowhammer within the periphery of the site, means that quarrying operations (e.g. blasting) are unlikely to be impacting breeding activity for the species.

Quarry faces are increasingly being utilised by breeding peregrine and quarries have facilitated the expanding breeding distribution for the species. Considering the survey's timing (July-August 2023), it is less likely that territorial behaviour among peregrine falcon would have been observed. However, one bird was observed flying around the western edge of the site, suggesting potential breeding activity within the quarry, although no evidence of a nest was found. As such, there is not considered to be any significant impact occurring on this Annex I species as a result of continued quarry operations.

7.2.5 Consideration of mitigation and enhancement measures

This section of the report outlines the mitigation and/or enhancement measures designed to prevent or minimise impacts on Important Ecological Features within the ZoI of the development. In this instance, impacts pertain to quarry operations as of 2023.

Without existing mitigation in place, the activities associated with ongoing quarry operations have the potential to pose a significant impact on a single ecological receptor within the ZoI of the development (i.e. water quality). The EMS for the site provides the list of mitigation

measures to control against contamination of surface water and groundwater, thereby protecting watercourses in the local area. Recent upgrades to the existing drainage infrastructure is likely to have resulted in improved environmental performance on-site, which is being assessed through routine monitoring of the discharge point.

There were no high impact invasive plant species (as listed by NBDC) recorded as part of the 2023 site visits at Tromman Quarry, nor were there any plant species recorded that are included on the Third Schedule of Regulations 49 and 50 (not yet in effect) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).

7.2.6 Residual impacts and effects on important ecological features

Negative residual impacts are limited to negligible to minor long-term impacts. These are not considered to be ecologically significant. As shown in **Table 9** below, residual impacts will not result in any significant effects on Important Ecological Features within the ZoI.

Table 9. Summary of potential impacts, potential effects, mitigation undertaken and residual effects.

Important Ecological Features	Evaluation	Potential Impact	Potential Effect	Potential Significance	Mitigation/Compensation Undertaken	Significance of Residual Effect
Designated Sites						
River Boyne and Blackwater SAC	International	Pollution due to suspended solids and chemical entering watercourses connecting to site	Impact on habitats sensitive to pollution and species either sensitive to pollution or relying on prey that are sensitive to pollution.	Potentially significant (Although site is located *c.* 10 km via hydrological connection)	Environmental Management System (EMS) applied since 2009, updated 2023.	Not significant
River Boyne and Blackwater SPA	International	Pollution due to suspended solids and chemical entering watercourses connecting to site	Impact on habitats sensitive to pollution and species either sensitive to pollution or relying on prey that are sensitive to pollution.	Potentially significant (Although site is located *c.* 10 km via hydrological connection)	Environmental Management System (EMS) applied since 2009, updated 2023.	Not significant
Habitats						
Dry meadows and grassy verges	Local (Higher)	Habitat loss	Loss of cover within the site	Significant	Area of site not targeted for removal.	Not significant
Scrub	Local (Higher)	Habitat loss	Loss of cover within the site	Significant	Planting of woodland for screening belts undertaken (2012)	Not significant
Immature woodland	Local (Higher)	Habitat loss	Loss of cover within the site	Significant	Immature woodland along southern boundary not targeted for removal	Not significant
Hedgerows	Local (Higher)	Permanent loss of hedgerow	Loss of, or damage to sections hedgerow leading to reduced connectivity and loss of foraging habitat and cover for breeding fauna	Significant	Hedgerows on-site not targeted for removal.	Not significant
Treelines	Local (Higher)	Permanent loss of treeline	Loss of, or damage to sections treeline leading to reduced connectivity and loss of foraging habitat and cover for breeding fauna	Significant	Existing treelines on-site not targeted for removal	Not significant
Earth banks	Local (Higher)	Permanent loss of habitat - cover for birds /	Loss of cover for fauna	Significant	Existing earth banks on-site not targeted for removal	Not significant

Important Ecological Features	Evaluation	Potential Impact	Potential Effect	Potential Significance	Mitigation/Compensation Undertaken	Significance of Residual Effect
		small mammals				
Fauna						
Birds	Local (Higher)	Habitat loss/disturbance	Potential for loss or disturbance of nesting sites	Significant	Implementation of minimal blasting schedule during the early stages of the breeding season (late March to early May) to limited disturbance to breeding birds (e.g. peregrine).	Not significant
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Bats (foraging & commuting)	Local (Higher)	Removal of potential foraging habitat.	Potential disturbance / displacement to foraging bats.	Significant	Planting on southern boundary of site will provide additional foraging opportunity on-site.	Not Significant
Invasive Alien Species (IAS)						
Invasive Alien Species (IAS)	-	Potential for spread around site and then dispersal through transportation of quarried materials	Spreading of IAS would be to the detriment of native species and habitats. Species recorded are low impact IASs	Not Significant		Not significant

7.3 Impacts that can Reasonably be Expected to Occur

The final stage of the assessment considers the significant effects, or impacts, which can reasonably be expected to occur as a result of the development, considering both the prospect of immediate remediation, or the alternative of continued operations under separate consent (i.e. Section 37L (s.37L) of the Planning and Development Act (as amended)). This section only assesses the potential ecological impacts of immediate site restoration, as the predicted impacts associated with the continuation of operations and extension of the existing quarry are detailed in a separate ecological assessment (see Woodrow, 2023a), which is submitted as part of the s.37L application.

As outlined in Section 3 of the rEIAR, restoration of the site would involve the decommissioning and dismantlement of the structures in the manufacturing area, as well as plant and machinery, and the remediation completed by the removal of the concrete yard. In terms of the restoration of the quarry void, it is understood that the quarry consents provide for bench and margin treatment and planting, with placement of some overburden resources around the quarry and then for the quarry void to be allowed to flood with anticipated water rebound levels of the order of 62 m AOD (± 2 m). However, and as outlined, this rebound level is more likely to be in the region of 65 m AOD.

7.3.1 Impacts expected to occur on Designated Sites

The River Boyne and Blackwater SAC and the River Boyne and Blackwater SPA fall within the potential ZoI because of the existing hydrological link with the quarry and hence, the potential for water quality impacts, and consequent impacts on the QIs and/or SCI.

The rNIS (Woodrow, 2023b) concluded that the distance of the hydrological link to European Sites downstream of the development (*c*. 10 km) in combination with the control measures within the site, mean that there is no potential for adverse impacts on the integrity of the River Boyne and Blackwater SAC or SPA. In addition, during restoration of the quarry de-watering activities would cease meaning that discharge and flow into the northern drain would also cease further diminishing any hydrological link between the site and the SAC/SPA.

7.3.2 Impacts expected to occur on habitats

The restoration approved for the quarry and the remedial works for the manufacturing facility and the quarry are limited, the overall impact would be positive. The site would be restored for nature conservation through planting and natural regeneration, the range and extent of habitats occurring on the site would increase including, grasslands, transitional scrub, woodland and a lake surrounded by rocky cliffs, which will provide opportunities for a range of species.

7.3.3 Impacts expected to occur on fauna

Site remediation will result in positive impacts for wildlife in the area. As disturbance factors including light pollution dissipate and vegetation cover regenerates connectivity through the site will be improved and more sensitive species will re-colonise the area. Species of conservation interest, including bats and peregrine, that occupied the site during the operational phase of the development will not be negatively impacted by the site remediation process. Cliffs providing nesting ledges for peregrine, as well as other species of bird like kestrel and ravens will be retained. Foraging and commuting bats in particular will benefit from

an increase in vegetation cover within the site [redacted]

7.4 Cumulative Impacts

Cumulative impacts that have occurred, could potentially include contributions to habitat fragmentation, cumulative disturbance to fauna, and cumulative water quality impacts.

As detailed in **Sections 507.1** and **7.2**, no habitat fragmentation has occurred, or is occurring as a result of the unauthorised works, with linear features around the site (such as hedgerows, treelines and drains) being retained. There is therefore not considered to be any potential for cumulative impacts in this regard.

Disturbance to breeding birds, bats and other fauna have also been considered in **Sections 507.1** and **7.2**, and are deemed to be absent or not significant, and are therefore not considered to contribute to wider disturbance in the area.

Cumulative water quality impacts relate to both localised impacts on the Rathmolyon and Knightsbrook streams, as well as downstream impacts on the River Boyne and River Blackwater SAC and SPA. The potential for cumulative impacts on these European Sites is dealt with in the accompanying rNIS (Woodrow 2023b). As outlined, the most recent Q-value rating (2020) classifies the Knightsbrook stream as having 'Moderate Status' (Q3-4) in accordance with Water Framework Directive (WFD) monitoring. While this signifies a minor decline in water quality compared to the previous monitoring cycle, it remains marginally superior to another monitoring station located upstream of where the Rathmolyon (which receives discharge from Tromman Quarry) and the Knightsbrook streams converge. This suggests that while there may have been other pressures elsewhere in the river network, the quarry itself is unlikely to have contributed to cumulative water quality impacts.

In addition, and as outlined in the Water Environment Chapter of the rEIAR, water samples are collected on a regular basis and submitted for laboratory analysis in order to demonstrate compliance with the discharge consent (Trade Effluent Discharge Licence Ref. 04/2).

While the discharge waters generally adhered to the standards specified in the discharge consent, there was observed variability in suspended solid levels. These levels ranged from <2 mg/l (below the laboratory limit of detection) to a single instance of 41 mg/l in September 2022 (as per Discharge Effluent Quality Reports provided by Byrne Environmental Consulting Ltd.). However, the measured values for suspended solids mostly remained below the Emission Limit Values (ELV) of 35 mg/l set out within the EPA (2006) environmental management guidelines for the extractive industry, as well as the European Communities (Quality of Salmonid Waters) Regulations 1988 (S.I. No. 293 of 1988), which established a standard of ≤ 25 mg/l for salmonid waters. This includes the main channel of the River Boyne, which constitutes part of the River Boyne and Blackwater SAC and SPA located *c.* 10 km away.

Therefore, despite occasional instances of elevated levels, the ongoing mitigation measures, such as drainage arrangements and settlement infrastructure, have been largely effective at minimising the overall concentration of suspended solids and other pollutants leaving the quarry site. Hence, reducing the overall potential for cumulative water quality impacts within the local watercourses.

There are no other issues that are considered to be relevant with respect to potential cumulative impacts for this site.

8 CONCLUSIONS

Based on the collation of above information, it is considered that activities associated with the pre-cast concrete manufacturing facility and extractive operations at Tromman Quarry have had a low overall impact on the Important Ecological Features identified within the site and its environs. Any potential water quality impacts pertaining to quarry operations have been largely mitigated through existing control measures outlined in the company's EMS (see **Section 7**). This includes upgrades to the current drainage infrastructure on site as well as regular monitoring of the discharge effluent leaving the site.

There has been no additional loss of sensitive habitat post the period of consent (05 August 2018), with the only exception being the removal of a disused garage and small area of hedgerow in the south-east corner of the site. Regardless, these were assessed as part of surveys performed in 2019 and considered to have low ecological value. Moreover, none of the habitats on site are particularly rare or of significant ecological importance on a national or European scale.

Given the existing habitats, and the permitted post-operational remedial landscaping and planting works, it is considered that the development shall result in a short to medium term ecological impact throughout operation, which will be negated by the continued implementation of best practice mitigation measures across the site. As a result, the development is not considered to have had, be having or reasonably likely to have any significant impact beyond the local level.

9 REFERENCES

BCL Consultant Hydrogeologists Ltd. (2023). Tromman Quarry, Tromman, Rathmolyon, Co. Meath – Planning Application for Substitute Consent for Unauthorised Development on Lands at Tromman Quarry – Hydrogeological and Hydrological Impact Assessment. BCL Consultant Hydrogeologists Ltd. prepared for Quarryplan Ltd.

Byrne Environmental Consulting Ltd. (2009, updated 2023). Environmental Management System (EMS) for Keegan Quarries Ltd, Tromman Quarry, Rathmolyon, Co. Meath.

CIEEM 2018. Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater and Coastal. Version 1.2 – Updated 2022. Available Online at: https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf (Accessed September 2023).

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.

Colhoun, K. & Cummins, S. (2013). Birds of Conservation Concern in Ireland 2014 –2019. *Irish Birds* 9: 523—544.

Directive 2009/147/EC on the Conservation of Wild Birds.

EPA (2006). Environmental Management Guidelines – Environmental Management in the Extractive Industry (Non-Scheduled Minerals). Environmental Protection Agency, Wexford, Ireland.

Farmer, A.M. (1993). The Effects of Dust on Vegetation – A Review. *Environmental Pollution* 79:1, 63-75.

Gilbert, G., Stanbury, A., & Lewis, L. (2021) Birds of Conservation Concern in Ireland 2020 – 2026. *Irish Birds* 43: 1—22.

Fossitt, J.A. (2000). A guide to habitats in Ireland. Heritage Council.

Lundy, M.G., Aughney, T., Montgomery, W.I., & Roche, N. (2011). Landscape Conservation for Irish Bats & Species Specific Roosting Characteristics. Bat Conservation Ireland.

NPWS (2010). Site Synopsis for River Boyne and River Blackwater SPA.

NPWS (2014). Site Synopsis for River Boyne and River Blackwater SAC.

NRA (2009b). Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (Rev 2). National Roads Authority, Dublin.

Smith G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011). Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council, Kilkenny, Ireland.

UK DoE (1995). The Environmental Effects of Dust from Surface Mineral Workings – Volume 1 Summary Report and Best Practice Guides. HMSO, UK.

Wray, S., Wells, D., Long, E. & Mitchell-Jones, T. 2010. Valuing Bats in Ecological Impact Assessment. CIEEM In Practice, Number 70. December 2010.

Woodrow (2023a). Ecological Impact Assessment (EcIA) – Recommencement of Quarrying Operations, Tromman Quarry, Co. Meath

Woodrow (2023b). Remedial Natura Impact Statement (rNIS) – Substitute Consent Application: Concrete Manufacturing Facility & Quarrying Activities, Tromman Quarry, Co. Meath.