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INTRODUCTION

Background

5.1 This Chapter of the Environmental Impact Assessment Report addresses the potential effects on Biodiversity of the proposed establishment and operation of a materials recovery / recycling facility and inert landfill at Ballinclare Quarry, Kilbride, Co. Wicklow. The proposed development comprises three key elements

- a soil washing plant to win aggregate from imported soil and stone;
- a construction and demolition (C&D) waste recycling facility to produce aggregate from construction and demolition waste (principally concrete); and
- an engineered (i.e. lined) landfill to facilitate backfilling and restoration of the existing quarry void with inert waste (principally soil and stone).

5.2 The planning application site, hereafter referred to as the application site or the site, is located approximately 2.5km to the north-west of the small settlement of Kilbride and c. 2.5 km south of the village of Glenealy. The larger settlements of Rathdrum and Wicklow town are located 5.5 km to the west and 6 km to the north-east, respectively. The M11 motorway runs in a north-south direction c. 400 m to the east of the site.

5.3 The application site comprises a large disused quarry void, a former processing area in the south-eastern corner of the site and a concrete paved area to the west of the site access road, some areas of woodland, grassland and scrub (within which settlement ponds are located).

5.4 The proposed development provides for the importation, re-use, recovery and/or disposal of a range of inert wastes generated by construction and development projects in Counties Wicklow, Dublin and Wexford as well as the re-use of excess, non-waste by-product materials (principally uncontaminated soil and stone).

5.5 The proposed soil wash plant will be set up and operated at the former concrete / asphalt production yard in the south-eastern corner of the application site. This plant will principally recover sand and gravel and recycled (secondary) aggregates from more granular soil intake and claybound C&D materials. Aggregates will be won from imported non-waste by-product as well as from inert waste materials.

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5.7 All aggregates from waste will be of construction grade and will comply with an engineering specification and the End of Waste criteria for recycled aggregates recently published by the EPA.

5.8 It is proposed to backfill the existing quarry to original / surrounding ground level by importing and placing inert waste, principally soil and stone, in a lined landfill facility and in so doing, re-establish the original landform which existed prior to quarrying. The landfilling and restoration activities will be undertaken on an ongoing, progressive basis and on completion, the final landform will be restored to a native woodland habitat.

5.9 The proposed maximum intake rate of soil and stone (waste and by-product) for aggregate processing / recovery / recycling and landfilling / disposal is 550,000 tonnes per annum. The maximum rate of C&D waste recovery is 50,000 tonnes per

annum. At a maximum combined intake rate of 600,000 tonnes per annum, activities will generate an average of approximately 9 to 10 HGV return trips per hour every working day.

5.10 The development proposal provides for the routing of all traffic to and from the proposed development along the L1157 Local Road. It also includes provision for a comprehensive road improvement scheme along the entire length of the L1157 leading up to the application site, including road widening to 6.0m everywhere along its length, with road strengthening and repair overlay and road markings where required.

5.11 Under the routing proposal, the majority of the HGVs travelling to the proposed development from Dublin and North Wicklow will use the M11 Motorway, exiting at Junction 18 and joining the R772 Regional Road southbound. After travelling south for approximately 4km, traffic heading for the facility will turn right, off the R772, and onto the L1157 at the ghost island junction beside the Junction 18 Coffee Shop and Green Angel premises at Kilbride. The access junction to the quarry and proposed development is located along the L1157, approximately 2km north-west of the R772 junction.

5.12 It is estimated that only a minor proportion of HGV traffic will arrive from the direction of Arklow and North Wexford. This traffic will use the M11 Motorway, exiting at Junction 19 to turn onto the R772 Regional Road at Jack Whites Pub. It will then travel north for approximately 5km, turn left off the R772 and onto the L1157, and continue thereafter up to the quarry and proposed development.

5.13 The proposed haul route requires all HGV traffic departing the proposed facility to turn left and follow the upgraded L1157 back to the junction with the R772 Regional Road, and from there continue toward the national motorway network.

5.14 Further detail on the proposed development (site infrastructure, operations, environmental management systems and controls etc.) are provided in Chapter 2 of this EIAR.

5.15 This Chapter of the EIAR provides a description of the existing flora, fauna and habitats present in the local area, both in the context of the site and the wider locality including the proposed access route, and assesses the potential impacts that the proposed development will have on biodiversity features in the receiving environment including designated sites.

5.16 Information to inform the assessment was collated following detailed desktop and field studies, with the field surveys carried out between December 2023 and September 2024.

5.17 Key to the assessment of effects on the local biodiversity are an understanding of the potential for emissions from the site, during and post operation and the information presented in other Chapters of the EIAR, especially in relation to the project description (Chapter 2), Lands, Soils & Geology (Chapter 6), Hydrology & Hydrogeology (Chapter 7), Air Quality (Chapter 8) and Noise & Vibration (Chapter 10). Design elements and proposed environmental controls are considered.

5.18 The project includes detailed commitments in relation to phased restoration of the site and as part of the Biodiversity Chapter we have identified a number of measures which when implemented will enhance the local biodiversity through provision and management of habitat and nesting/roosting resources for birds and bats. In addition, commitments to control invasive species and establish large areas of native woodland will enhance the biodiversity potential of the site.

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5.19 The scope of this EIA Chapter includes:

- An assessment of the existing flora, fauna and habitats within and close to the application site area;
- An assessment of the potential impact of the proposed landfilling and soil / C&D waste on the local ecology, as well as sites downstream of the development site through potential effects on surface water and groundwater;
- A review and assessment of issues previously raised in the historical planning application for landfilling at this site (PL: SI202103) and associated Inspectors Report related to ABP-30991-21, specifically related to Biodiversity; and,
- Where necessary, recommendation(s) of mitigation measures to reduce or eliminate any potential impact(s).

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5.20 A formal consultation exercise was undertaken with statutory consultees and nearby residents / members of the general public in August 2024. Details of these consultations and the feedback obtained therefrom is provided in a separate report submitted in support of this application. Any specific feedback provided in respect of biodiversity related impacts has been considered and addressed as appropriate in drafting this Chapter of the EIAR.

5.21 A site meeting and walkover of the proposed development site was facilitated on June 28th 2024. In attendance were members of the project team and a number of National Parks & Wildlife Service (NPWS) staff led by Divisional Ecologist Ms. Ciara Flynn. Details of the proposed project were presented and the site was walked with locations of the key infrastructure proposed highlighted. Feedback and recommendations received from NPWS is reflected in the measures proposed in this Chapter, including the preference for trees of local provenance.

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5.31 Additionally, where observed and identifiable by the surveyor, taxonomic groups such as bryophytes and invertebrates have been recorded. It should be noted that any lists provided within this report are not exhaustive (i.e. bryophytes listed likely only represent a small proportion of those present on Site). However, available desktop sources of data, e.g. the Flora Protection Order (FPO) Map Viewer (Bryophytes database) as held by the NPWS was also reviewed in August 2024.

REGULATORY BACKGROUND

Legislation

5.32 This section references legislation and guidelines which may, as required be consulted for the preparation of this Chapter of the EIAR.

5.33 The key European Directives / European Union Legislation apply to this biodiversity assessment are:

- Environmental Impact Assessment Directive (2011/92/EU);
- The Birds Directive (Directive 2009/147/EC; and

- The Habitats Directive (92/43/EEC).

Planning Policy and Development Control

5.34 Planning Policy and Development Control relating to Biodiversity at the application site is set by national and local plans and policies including the Wicklow County Development Plan 2022-2028, Wicklow Biodiversity Action Plan 2010-2015 and the 4th National Biodiversity Plan 2023-2030.

Guidelines

5.35 The assessment involved undertaking field assessments and a desktop review, which are described in the relevant sections of the methodology section below, taking due regard of guidelines relating to ecological assessments (e.g. EPA 2022, CIEEM 2018).

5.36 Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – European Commission Methodical Guidance on the provisions of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (European Commission 2001)

5.37 Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (DoEHLG 2009)

5.38 Integrated Biodiversity Impact Assessment – Streamlining AA, SEA and EIA Processes: Practitioner's Manual (EPA 2013)

5.39 European Commission. Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, (21-11-18) C (2018) 7261 Final. Commission Notice Brussels.

RECEIVING ENVIRONMENT

Study Area

5.40 The application site is located in the townlands of Ballinclare and Carrigmore in Co. Wicklow. The site can be accessed via the M11 Motorway and L1113 Local Road and via the R772 Regional Road and L1157 Local Road (Figure 5-1).

5.41 The overall landholding within the ownership of the applicant is c.36 ha (89 acres), while the application site is 32.6ha (80.5 acres). The application area extends across all of the former quarry footprint and includes the former concrete / asphalt production area, a paved are to the west of the existing site access road, established site buildings and infrastructure and a network of settlement ponds in the south-western corner. It excludes a compound / yard area leased to Wicklow County Council in the north-western corner of the landholding.

5.42 The application site is bounded to the west by the L1113 Local Road and to the south by the L1157 Local Road. The wider locality is characterised by agricultural lands and occasional dwellings to the east of the site, with the M11 Motorway situated approximately 300m east of the site boundary. There are further agricultural lands and dwellings to the north of the site.

METHODOLOGY

Baseline Study Methodology

5.43 This assessment has been informed by the following sources of data:

- Desk based surveys and site surveys of the proposed development site and receiving environment, including the proposed primary haul route. The relevant 10km Grid Square that encompasses the site and access road;
- Information on the location, nature and design of the proposed project as provided in other specialist chapters of this EIAR and as part of previous applications at this site;
- Department of Housing, Planning, Community and Local Government (DHPCLG) online land-use mapping (www.myplan.ie/en/index.html);
- Environmental Protection Agency (EPA) geoportal mapping tool (https://gis.epa.ie/EPAMaps/);
- National Parks and Wildlife Service protected site and species information and data (https://www.npws.ie/protected-sites) as per data request;
- National Biodiversity Data Centre (www.biodiversityireland.ie); and
- Ordnance Survey of Ireland mapping and aerial photography (www.osi.ie).

5.44 The general survey schedule for the field assessments carried out to inform this Chapter of the EIAR is presented in Table 5.1.

Table 5-1
Survey Schedule for Ecological Surveys
(Undertaken to Inform the Biodiversity Assessment)

Date	Personnel	Surveys Undertaken
14/12/2023	GF	Winter bird survey walkover, mammal survey
26/01/2024	GF	Deploying cameras and bat detectors, winter bird survey, mammal walkover
08/03/2024	GF	Deploying cameras and bat detectors, Peregrine Falcon observation, site walkover
26/03/2024	GF	Checks along access routes for mammal signs, and bird point counts along L1157.
18/04/2024	GF & MK	Breeding bird survey, mammal walkover, bat roost checks in buildings.
13/05/2024	GF, FMA & MG	eDNA sampling, habitat and botanical survey,collection and redeployment of cameras and detectors. Driven bat survey transect after dark.
14/05/2024	GF & FMA	Breeding bird survey, mammal walkover, walkover and bird point counts along access route.
16/05/2024	GF & MK	Checks of Peregrine breeding activity, site walkover, collection and redeployment of cameras and detectors.
21/05/2024	COC	Habitat and botanical survey
22/05/2024	COC	Habitat and botanical survey
04/06/2024	GF	Attendance with NPWS at ringing of Peregrine chicks, other taxa
27/06/2024	GF	Mammal walkovers, including access route. Collection and redeployment of cameras and detectors. emergence survey and driven bat survey transect (after dark)

INTRODUCTION

Background

5.1 This Chapter of the Environmental Impact Assessment Report addresses the potential effects on Biodiversity of the proposed establishment and operation of a materials recovery / recycling facility and inert landfill at Ballinclare Quarry, Kilbride, Co. Wicklow. The proposed development comprises three key elements

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08/03/2024	GF	Deploying cameras and bat detectors, Peregrine Falcon observation, site walkover
26/03/2024	GF	Checks along access routes for mammal signs, and bird point counts along L1157.
18/04/2024	GF & MK	Breeding bird survey, mammal walkover, bat roost checks in buildings.
13/05/2024	GF, FMA & MG	eDNA sampling, habitat and botanical survey,collection and redeployment of cameras and detectors. Driven bat survey transect after dark.
14/05/2024	GF & FMA	Breeding bird survey, mammal walkover, walkover and bird point counts along access route.
16/05/2024	GF & MK	Checks of Peregrine breeding activity, site walkover, collection and redeployment of cameras and detectors.
21/05/2024	COC	Habitat and botanical survey
22/05/2024	COC	Habitat and botanical survey
04/06/2024	GF	Attendance with NPWS at ringing of Peregrine chicks, other taxa
27/06/2024	GF	Mammal walkovers, including access route. Collection and redeployment of cameras and detectors. emergence survey and driven bat survey transect (after dark)

Date	Personnel	Surveys Undertaken
28/06/2024	GF	NPWS site meeting, Mammal walkovers, including access route. Collection and redeployment of cameras and detectors.
17/07/2024	RM & BB	Aquatic ecology survey
17/07/2024	MK & FMA	Mammal walkovers, checks of habitats and mapping invasive species along access route, emergence survey and driven bat survey transect (after dark)
18/07/2024	RM & BB	Aquatic ecology survey
18/07/2024	MK & FMA	Mammal walkovers, other taxa
24/07/2024	GF	Collection of cameras and detectors. Peregrine observation. General walkover.
22/09/2024	COC	Botanical survey - late flowering species including along access track

Key:
GF – Dr. Gavin Fennessy MK – Marie Kearns FMA – Fiona May Aylward
COC – Cian O'Ceallaigh RM – Ross Macklin BB – Bill Brazier

Designated Sites

5.45 European (Natura 2000) sites include Special Areas of Conservation (SAC's) and Special Protection Areas (SPA's) for birds, nationally designated sites include Natural Heritage Areas (NHA's) and proposed Natural Heritage Areas (pNHA's). Designated nature conservation sites in the vicinity of the proposed development site were considered in detail as part of the terrestrial ecological assessment. Geographical Information Systems (GIS) software was used to map and measure the distance from the site boundary to nationally and European designated conservation sites. The boundary shapefiles were downloaded from NPWS in October 2024.

5.46 The potential for likely significant effects on European designated Natura 2000 sites arising from the proposed development is considered as part of a Screening for Appropriate Assessment and consequently the potential for adverse effects of the proposed project (in combination with other plans or projects) on Special Areas of Conservation and Special Protection Areas is assessed in the Natura Impact Statement that accompanies the EIAR. A nominal 15km hinterland area has been used in this assessment with reference, where appropriate, to more distant sites which may be ecologically linked with the development area. In keeping with current guidance, we consider the likely Zone of Influence (or Impact) for a proposed development and do not only consider sites out to this nominal distance of 15km. Where consideration of the Source-Pathway-Receptor (S-P-R) model indicates that there likely significant effects which in the absence of mitigation will occur in relation to more distant sites, these are considered as part of the screening process.

Habitat and Botanical

5.47 A desktop review of botanical data available for the study area was undertaken by consulting online databases to identify botanical species of interest (e.g. rare, protected) previously recorded within the relevant national grid squares that overlap the study area; in this case a review was undertaken of T28 the10km national grid square that encompasses the site from the National Biodiversity Data Centre

(NBDC) online database. A review of the Flora Protection Order (FPO) Map Viewer – Bryophytes database as held by the NPWS was also reviewed (August 2024).

5.48 The habitat and flora site assessment was carried out in accordance with current Irish habitat survey guidelines. An ecological survey of the Site was carried out on the 21st and 22nd May 2024, in warm (ca. 20°C), dry conditions, with a light breeze. A survey of late flowering plants was carried out on September 22nd 2024 and included the margins of the L1157 to the junction with the R772.

5.49 A survey of the habitats and invasive plant species along the margins of the L1157 was carried out on July 17th 2024.

5.50 Habitats were described and mapped following the standard scheme for classifying habitats in Ireland (Fossitt, 2000). The dominant plant species were recorded, and habitats were classified according to their vegetation types. Where appropriate consideration was given to whether habitats qualify, or could qualify, as corresponding Annex 1 habitats. Relative abundance of plant species was estimated using the DAFOR scale[1]. The scientific names for plant species use nomenclature given in An Irish Flora (Parnell & Curtis 2012).

5.51 During the walkover observations of birds, whether heard and/or seen, were recorded. Incidental sightings of other taxonomic groups were also recorded.

5.52 The conservation status of habitats and flora was considered in respect of the following: Irish Red Data Book for Vascular Plants (Wyse Jackson *et al.* 2016); Red List of Bryophytes (Lockhart *et al.* 2012); Flora Protection Order (2022); the EU Habitats Directive (92/43/EEC). Evaluation of the habitats present in terms of their ecological value was assessed using criteria amended from NRA (2009) and Nairn and Fossitt (2004).

Non-Volant Mammals

5.53 Non-volant mammal field surveys comprised walkovers and long-term deployment of multiple wildlife trail cameras at locations throughout the application site (Figure 5-2). The dates and duration(s) of deployment of trail cameras at each location is summarised in Table 5.2. Direct and photographic data were supplemented by casual records made in the course of other terrestrial field surveys (e.g. night-time active bat surveys,). Walkovers of the site to record signs of non-volant mammals were carried out over several days were carried out on dates described in Table 5.1. This includes walkovers of the main haul route along the L1157.

5.54 During the walkovers, all sightings and signs of mammal species or signs of mammal activity (e.g. droppings, tracks, burrows, setts, holts etc.) were recorded using field notes and/or hand-held GPS units. Techniques used to identify mammal activity followed recognised guidelines (e.g. Clark 1988, Sutherland 1996, Bang & Dahlstrom 2004 and JNCC 2004).

5.55 Trail cameras were deployed at a total of 19 locations from record mammal activity in the study area (Figure 5-2). These trail cameras ('camera traps') are small camera units that are left in situ to record mammals (and birds) that pass close to the deployment locations. When analysing the trail camera record records the first photo in a sequence is identified and counts as an 'observation'. To minimise inflating the number of 'observations' of a particular individual that stays close to the camera for a prolonged period, consecutive photos of a particular species are

[1] The DAFOR scale has been used to estimate the frequency and cover of the different plant species as follows: Dominant (D) - >75% cover, Abundant (A) – 51-75% cover, Frequent (F) – 26-50% cover, Occasional (O) – 11-25% cover, Rare (R) – 1-10% cover., The term 'Locally' (L) is also used where the frequency and distribution of a species are patchy and 'Edge' (E) is also used where a species only occurs on the edge of a habitat type.

required to be five or more minutes apart before another 'observation' for that species is registered. Photos of multiple individuals of one species are treated as a single observation.

5.56 A desktop study of non-volant mammal data was also undertaken by consulting the NBDC online mapping database to identify species historically recorded within the relevant 10km and 2km national grid squares overlapping the application site and proposed works along the L1157. The conservation status of mammals was considered in respect of the following: EU Habitats Directive; Irish Wildlife Acts (1976 - 2012 as amended); Red List of Terrestrial Mammals (Marnell *et al*. 2019).

Table 5-2
Deployment Dates for the Trail Cameras at Ballinclare Quarry 2024

Camera Name	Camera Location	Dates Active
TC1	Nr outfall from ponds	26 Jan-08 Mar, 15 May-23 Jun
TC2	On Pond	18 Apr - 20 May;
TC3	On middle Pond	14 May - 09 Jun
TC4	Beside northern track	18 Apr - 13 May
TC5	Southern woodland	15 May - 27 Jun
TC6	Near drain beside southern track	08 Mar - 14 May
TC7	Camera in tree nr pump-house	18 Apr - 16 May
TC8	Camera on fence near drain	18 Apr - 16 May
TC9	End of southern laneway	26 Jan - 08 Mar
TC10	Field towards north of site	16 May - 13 Jun
TC11	In woodland patch north of site	18 Apr - 27 Jun
TC12	Thick cover at southwest of site	18 Apr - 27 Jun
TC13	Rear of red-brick house	26 Mar - 01 Jun
TC14	Nr Quarry Void east of site	16 May - 27 Jun
TC15	Nr Quarry Void middle of site	26 Jan-08 Mar; 18 Apr-11 May
TC16	Track northeast of Ponds	18 Apr - 16 May
TC17	In old yard south of void	16 May - 27 Jun
TC18	In Wet Woodland south of yard	16 May - 27 Jun
TC 19	In red-brick house	18 Apr - 16 May

Bats

5.57 Survey methodologies are described below. The conservation status of bats was considered in respect of the following: Irish Wildlife Acts (1976 - 2012 as amended); Red List of Terrestrial Mammals (Marnell *et al.* 2019); EU Habitats Directive.

5.58 Multi-season active and passive bat field surveys at and in the vicinity of the study area were carried out. This included inspections of the buildings on site and ground-level tree-roost assessments of the trees identified as requiring removal to facilitate the proposed development (Collins 2016).

5.59 In addition, passive detectors were deployed in the redbrick house and in an enclosed shed to record any evidence of bat activity. An emergence survey was carried out around these buildings on July 17th 2024. These buildings are not being removed as part of the proposed development.

5.60 Passive bat detectors (Wildlife Acoustics SM4BAT & SM4BATMini) were deployed at various locations across the site (Figure 5-3) between late January 2024 and June 2024 (Table 5.1). The dates on which each of these detectors was actively recording is shown in Table 5.3.

5.61 Passive bat detectors were deployed at a height of approximately 2m above ground level where possible. Detectors were set to record bat calls (i.e. bat passes) from 30 minutes before sunset until 30 minutes after sunrise where GPS locations were set on each detector so that the units could automatically adjust their start and finish times based on sunrise / sunset times relative to the GPS locations. Bat calls were recorded onto SD cards within the passive detectors to allow post-hoc species identification of bat recordings through sonogram analysis. The recorded bat calls were processed and automatically identified using Kaleidoscope Pro software (V. 5.6). Automatic identifications were manually reviewed and verified following Russ (2012).

5.62 It is important to note that bat recordings are a measure of bat activity rather than a measure of abundance as recordings from the same species cannot be readily distinguished between individuals per se, especially in the absence of observations (see Collins 2016). In this case, a bat call or bat pass was defined as a recording of an individual species echolocation within a recording of up to 15 seconds duration (as prescribed in the settings for each Wildlife Acoustic SM3/SM4 full-spectrum unit), thereby allowing comparison of bat passes between passive monitoring units in this study.

Table 5-3
Passive Bat Detector Deployment Locations and Recording Periods

Detector Name	Detector Location	Period Active
BD1	Wood south of yard	26 Jan - 22 Feb
BD2	West of redbrick house	16 May - 27 Jun
BD3	Middle of eastern ponds	16 May - 07 Jun
BD4	South of redbrick house & sheds	26 Jan - 22 Feb; 08 Mar - 02 Apr
BD5	East of site entrance	16 May - 23 Jun
BD6	Outside redbrick house	10 Mar - 28 Mar; 04 Jun - 28 Jun
BD7	Southeast of site near quarry void	04 Jun - 28 Jun
BD8	Trees near house	16 May - 29 May
BD9	In shed	16 May - 04 Jun
BD10	In redbrick house	18 Apr - 16 May
BD11	Southwest of site	16 May - 04 Jun
BD12	Near quarry void east of site	04 Jun - 28 Jun
BD13	North of site	04 Jun - 28 Jun

5.63 Car-based active transect surveys were carried out over three nights in 2024 (Table 5.1) adopting the methodology used by Roche *et al.* (2004). The approach was to drive from the quarry site along the L1157 and using a handheld/mounted detector (BatLogger M2; Wildlife Acoustics EMT Pro2) to record calling bats along this section of road. The typical transect route is shown in Figure 5-4. The recordings were analysed using Kaleidoscope Pro software (V. 5.6).

5.64 A desktop study of bat data was also undertaken by consulting the NBDC online mapping database to identify bat species historically recorded within the relevant 2km and 10km national grid squares overlapping the application site and along the main access route. The NBDC online mapping database also hosts the Model of Bat Landscapes for Ireland, which has assessed the relative importance of landscape and habitat associations for bat species across Ireland (see Lundy *et al.* 2011); therefore, the landscape resource value for bats within the 10km national grid square (T28) overlapping the study area here was also reviewed.

5.65 Data on historic bat roosts in the wider area was sourced from Bat Conservation Ireland and the approximate locations of roosts mapped using GIS. Exact locations of roosts are not revealed due to the sensitivity of this information.

Birds

5.66 Desktop and field surveys were conducted to record the avian usage of the site throughout the year.

5.67 In addition to the field surveys, a desktop study was also undertaken by consulting the National Biodiversity Data Centre (NBDC) online mapping database to identify additional avian species historically recorded within the relevant 2km and 10km national grid squares overlapping the wind farm site. The conservation status of bird species was considered in respect of the following: Irish Wildlife Acts (1976 – 2012 as amended); Birds of Conservation Concern in Ireland (BoCCI) Red, Amber and Green lists (see Gilbert *et al.* 2021); EU Birds Directive (2009/147/EC) Annex I list.

5.68 Field surveys were undertaken using appropriate survey equipment as required (e.g. GPS units, binoculars, scope, notebooks etc.) and during suitable weather conditions.

5.69 Figure 5-5 shows the location of three transects used to record the bird community present at the site in winter and in the bird breeding season. Figure 5-6 shows the location of three Point Count locations used to assess the general breeding bird community present along the L1157 towards the junction with the R772.

5.70 The transects were chosen to record the general bird community across the range of habitats present at the former quarry site, using a standard approach (Bibby *et al.* 2000). Transects were each c. 500km in length and were surveyed on two occasions in each of the breeding and winter seasons (Table 5.1). All birds seen or heard on transect were recorded in two distance bands from the observer (<100m, >100m). The species and their abundance along each of the walked transect was noted on each survey occasion. The Point Counts were located at the margin of the public road and were surveyed twice in the bird breeding season. Birds seen or heard were recorded in two distance bands (<50m, >50m) over a ten-minute period.

5.71 Regular watches of the cliff face were undertaken to record the presence and activity of Peregrine Falcon, *Falco peregrinus* at the site. The site had been regularly used by nesting Peregrine Falcon (NPWS) in previous years. Watches were undertaken from a distance using a telescope and observations of birds present were recorded. Exact locations of Peregrine Falcon nest sites are not presented due to the sensitivity of such information.

Aquatic Ecology

5.72 All freshwater habitats which could be affected directly or indirectly by the proposed development were considered as part of the current assessment. A total of n=12 riverine and lacustrine sites in the vicinity of Ballinclare Quarry were selected for detailed aquatic assessment (see Table 5.4, Figure 5-7 below). The courses and nomenclature for the watercourses surveyed followed Environmental Protection Agency (EPA) mapping.

5.73 Riverine survey sites were present on the Potters River (EPA code: 10P01) and its tributaries the Ballinameesda Lower Stream (10B74) and an unnamed stream known locally as the Ballinclare Stream (no EPA code; Table 5.4). A total of 5 No. ponds and 1 No. lake (the quarry void) were also surveyed. The aquatic survey sites were located in the Redcross_010 river sub-catchment within hydrometric area 10 (Ovoca-Vartry). The proposed development was not located within a European site but shared downstream hydrological connectivity to the Buckroney-Brittas Dunes & Fen SAC (000729) via the Potters River.

5.74 Aquatic surveys of the watercourses within the vicinity of Ballinclare Quarry were conducted on the 17th and 18th July 2024. Survey effort focused on both instream and riparian habitats at each aquatic sampling location and included a fisheries assessment (electro-fishing and or fisheries habitat appraisal), white-clawed crayfish (*Austropotamobius pallipes*) survey, otter (*Lutra lutra*) survey, macrophyte/aquatic bryophyte survey, macro-invertebrates and biological water quality sampling (Q-sampling; Figure 5-7). This holistic approach informed the overall aquatic ecological evaluation of each site/watercourse in context of the proposed development and ensured that any habitats and species of high conservation value would be detected to best inform mitigation.

5.75 In addition to the ecological characteristics of the site, a broad aquatic and riparian habitat assessment was conducted utilising elements of the methodology given in the Environment Agency's 'River Habitat Survey in Britain and Ireland Field Survey Guidance Manual 2003' (EA, 2003) and the Irish Heritage Council's 'A Guide to Habitats in Ireland' (Fossitt, 2000). This broad characterisation helped define the watercourses' conformity or departure from naturalness. All sites were assessed in terms of:

- Physical watercourse/waterbody characteristics (i.e. width, depth, channel form) including associated evidence of historical drainage
- Substrate type and relative condition, listing substrate fractions in order of dominance (i.e. bedrock, boulder, cobble, gravel, sand, silt etc.)
- Flow type by proportion of riffle, glide and pool in the sampling area
- An appraisal of the macrophyte and aquatic bryophyte community at each site
- Riparian vegetation composition and bordering land use practices

5.76 A single anode Smith-Root LR24 backpack (12V DC input; 300V, 100W DC output) was used to electro-fish sites on riverine watercourses in the vicinity of Ballinclare Quarry in July 2024 following notification to Inland Fisheries Ireland and under the conditions of a Department of the Environment, Climate and Communications (DECC) licence. The electro-fishing survey was undertaken across 6 No. riverine sites (see Table 5.4, Figure 5-7).

5.77 Both river and holding tank water temperature was monitored continually throughout the survey to ensure temperatures of 20°C were not exceeded, thus minimising stress to the captured fish due to low dissolved oxygen levels. A portable battery-powered aerator was also used to further reduce stress to any captured fish

contained in the holding tank. Salmonids, European eel and other captured fish species were transferred to a holding container with oxygenated fresh river water following capture. To reduce fish stress levels, anaesthesia was not applied to captured fish. All fish were measured to the nearest millimetre and released in-situ following a suitable recovery period.

5.78 As three primary species groups were targeted during the survey, i.e., salmonids, lamprey, and eel, the electro-fishing settings were tailored for each species. By undertaking electro-fishing using the rapid electro-fishing technique (see methodology below), the broad characterisation of the fish community at each sampling reach could be determined as a longer representative length of channel was surveyed. Electro-fishing methodology followed accepted European standards (CEN, 2003) and adhered to best practice (e.g., CFB, 2008).

5.79 For salmonid species and European eel, as well as all other incidental species, electro-fishing was conducted in an upstream direction for a 10-minute CPUE, an increasingly common standard approach for wadable streams (Matson *et al.*, 2018). A total of approx. 40-75m channel length was surveyed at each site, where feasible, in order to gain a better representation of fish stock assemblages.

5.80 Relative conductivity of the water at each site was checked in-situ with a conductivity meter and the electro-fishing backpack was energised with the appropriate voltage and frequency to provide enough draw to attract salmonids and European eel to the anode without harm. For the moderate conductivity waters of the sites a voltage of 220-250v, frequency of 35-40Hz and pulse duration of 3.5-4ms was used to draw fish to the anode without causing physical damage.

5.81 Electro-fishing for lamprey ammocoetes was conducted using targeted quadrat-based electro-fishing (as per Harvey & Cowx, 2003) in objectively suitable areas of sand/silt, where encountered. As lamprey take longer to emerge from silts and require a more persistent approach, they were targeted at a lower frequency (30Hz) burst DC pulse setting which also allowed detection of European eel in sediment, if present. Settings for lamprey followed those recommended and used by Harvey & Cowx (2003), APEM (2004) and Niven & McAuley (2013). Using this approach, the anode was placed under the water's surface, approximately 10-15cm above the sediment, to prevent immobilising lamprey ammocoetes within the sediment. The anode was energised with 100V of pulsed DC for 15-20 seconds and then turned off for approximately five seconds to allow ammocoetes to emerge from their burrows. The anode was switched on and off in this way for approximately two minutes. Immobilised ammocoetes were collected by a second operator using a fine-mesh hand net as they emerged. Lamprey species were identified to species level, where possible, with the assistance of a hand lens, through external pigmentation patterns and trunk myomere counts as described by Potter & Osborne (1975) and Gardiner (2003).

5.82 A fisheries habitat appraisal of all riverine and lacustrine survey sites was undertaken to establish the importance of the supporting habitats as nursery, spawning and or holding habitats for salmonids and lamprey species but also considered European eel and other fish species. The appraisals of salmonids and lamprey were cognisant of species-specific habitat requirements and preferences as outlined in O'Grady (2006), Hendry *et al.* (2003), Armstrong *et al.* (2003), Harvey & Cowx (2003), Maitland (2003) and Hendry & Cragg-Hine (1997). River habitat surveys and fisheries assessments were also carried out utilising elements of the approaches in the River Habitat Survey Methodology (Environment Agency, 2003) and Fishery Assessment Methodology (O'Grady, 2006) to broadly characterise the riverine sites (i.e., channel profiles, substrata etc.).

5.83 White-clawed crayfish surveys were undertaken at the aquatic survey sites in July 2024 under a National Parks and Wildlife (NPWS) open national licence (No. C20/2024), as prescribed by Sections 9, 23 and 34 of the Wildlife Act (1976-2023), to capture and release crayfish to their site of capture. As per Inland Fisheries Ireland aquatic biosecurity recommendations, the crayfish sampling started at the uppermost site(s) of the catchment/sub-catchments in the survey area to minimise the risk of transfer invasive propagules (including crayfish plague) in an upstream direction.

5.84 Hand-searching of instream refugia and sweep netting was undertaken according to Reynolds *et al.* (2010). An appraisal of white-clawed crayfish habitat at each site was conducted based on physical habitat attributes (Gammell *et al.*, 2021; Peay, 2003), water chemistry and incidental records in mustelid spraint. Additionally, a desktop review of crayfish records within the wider survey area was completed.

5.85 To further validate site surveys and to detect potentially cryptically-low populations of protected and or rare aquatic species within the study area, composite water samples were collected by Ecology Ireland from the existing quarry settlement ponds in May 2024 (Figure 5-8; Table 5.1). These were analysed for white-clawed crayfish, European eel (*Anguilla anguilla*), smooth newt (*Lissotriton vulgaris*) and common frog (*Rana temporaria*) environmental DNA (eDNA).

5.86 In accordance with laboratory guidance, a composite (500ml) water sample was collected from the sampling point, maximising the geographic spread at the site (20 x 25ml samples at each site), thus increasing the chance of detecting the target species' DNA. The composite sample was filtered and fixed on site using a sterile proprietary eDNA sampling kit. The sample was stored at room temperature and sent to the laboratory for analysis with 48 hours of collection. A total of n=12 qPCR replicates were analysed for the site. Given the high sensitivity of eDNA analysis, a single positive qPCR replicate is considered as proof of the species' presence (termed qPCR No Threshold, or qPCR NT). Whilst an eDNA approach is not currently quantitative, the detection of the target species' DNA indicates the presence of the species at and or upstream of the sampling point. Please refer to Appendix 5-A for full eDNA laboratory analysis methodology.

5.87 The 6 No. riverine survey sites were assessed for biological water quality through Q-sampling in July 2024 (Table 5.4). All samples were taken with a standard kick sampling hand net (250mm width, 500µm mesh size) from areas of riffle/glide utilising a 2-minute kick sample, as per Environmental Protection Authority (EPA) methodology (Feeley *et al.*, 2020). Large cobble was also washed at each site for 1-minute (where present) to collect attached macro-invertebrates (as per Feeley *et al.*, 2020). Samples were elutriated and fixed in 70% ethanol for subsequent laboratory identification to species level. Samples were converted to Q-ratings as per Toner *et al.* (2005) and assigned to WFD status classes (Table 5.5). Any rare invertebrate species were identified from the NPWS Red List publications for beetles (Foster *et al.*, 2009), mayflies (Kelly-Quinn & Regan, 2012), stoneflies (Feeley *et al.*, 2020) and other relevant taxa (i.e. Byrne *et al.*, 2009; Nelson *et al.*, 2011).

5.88 A total of 5 No. ponds and 1 No. quarry lake/void were sampled for macro-invertebrates via sweep netting in July 2024. A standard pond net (250mm width, mesh size 500µm) was used to sweep macrophytes and submerged vegetation to capture macro-invertebrates. The net was also moved along the bed to collect epibenthic and epiphytic invertebrates from the substratum (as per Cheal *et al.*, 1993). A 3-minute sampling period was employed. To ensure appropriate habitat coverage, the sampling period was also divided amongst the range of meso-habitats present at the survey site to get a representative sample for sub-habitats.

5.89 Surveys of the macrophyte and aquatic bryophyte community were conducted by instream wading at each of the survey sites, with specimens collected (by hand or via grapnel) for on-site identification. An assessment of the aquatic vegetation community helped to identify any rare macrophyte species listed under the Flora (Protection) Order, 2022 and or Irish Red list for vascular plants (Wyse-Jackson *et al.*, 2016) or habitats corresponding to the Annex I habitats, e.g., 'Water courses of plain to montane levels, with submerged or floating vegetation of the *Ranunculion fluitantis* and *Callitricho-Batrachion* (low water level during summer) or aquatic mosses [3260]' (more commonly referred to as 'floating river vegetation').

5.90 The presence of otter was determined through the recording of otter signs within 150m radius of each survey site. Notes on the age and location of signs (ITM coordinates) were made, in addition to the quantity and visible constituents of spraint (i.e. remains of fish, crustaceans, molluscs etc.).

A strict biosecurity protocol following IFI (2010) and the Check-Clean-Dry approach was adhered to during surveys for all equipment and PPE used. Disinfection of all equipment and PPE before and after use with Virkon™ was conducted to prevent the transfer of pathogens or invasive propagules between survey sites. Surveys were undertaken at sites in a downstream order to minimise the risk of upstream propagule mobilisation. Furthermore, staff did not undertake any work in a known crayfish plague catchment for a period of <72hrs in advance of the survey. Where feasible, equipment was also thoroughly dried (through UV exposure) between survey areas. Any aquatic invasive species or pathogens recorded within or adjoining the survey areas were geo-referenced. All Triturus staff are certified in 'Good fieldwork practice: slowing the spread of invasive non-native species' by the University of Leeds.

Table 5-4
Location of n=12 Aquatic Survey Sites in the Vicinity of Ballinclare Quarry

Site No.	Watercourse	EPA Code	Location	X (ITM)	Y (ITM)
A1	Potters River	10P01	Ballinclare	726029	689176
A2	Potters River	10P01	Ballinameesda Lower	726252	688166
B1	Ballinclare Stream	n/a	Carrigmore	724973	688896
B2	Ballinclare Stream	n/a	Ballinclare	725390	688671
C1	Ballinameesda Lower Stream	10B74	Kilmacurra East	725420	688536
C2	Ballinameesda Lower Stream	10B74	Ballinclare	725584	688567
L1	Quarry void (lake)	n/a	Ballinclare Quarry	725475	689041
P1	Pond	n/a	Ballinclare Quarry	724952	689009
P2	Pond	n/a	Ballinclare Quarry	724970	689017
P3	Pond	n/a	Ballinclare Quarry	725031	689034
P4	Pond	n/a	Ballinclare Quarry	725014	689058
P5	Pond	n/a	Ballinclare Quarry	725003	689074

Table 5-5
Reference Categories for EPA Q-Ratings (Q1 to Q5) (Toner et al., 2005)

Q value	WFD status	Pollution status	Condition
Q5 or Q4-5	High status	Unpolluted	Satisfactory
Q4	Good status	Unpolluted	Satisfactory
Q3-4	Moderate status	Slightly polluted	Unsatisfactory
Q3 or Q2-3	Poor status	Moderately polluted	Unsatisfactory
Q2, Q1-2 or Q1	Bad status	Seriously polluted	Unsatisfactory

Other Protected Fauna

5.91 Observations of other terrestrial taxa casually noted during other terrestrial biodiversity surveys were also included as part of this assessment. A desktop study of other terrestrial taxa was also undertaken by consulting the NBDC online database to identify additional other taxa species that are legally protected previously recorded within the relevant 2km and 10km national grid squares overlapping the site and the access road along the L1157.

5.92 As described above in Paras 5.85 and 5.86, eDNA samples were taken to confirm the presence/absence of potentially cryptically-low populations of protected and or rare aquatic species within the study area. The samples were analysed at SureScreen Scientifics laboratory in the UK.

5.93 The conservation status of other taxa was considered in respect of the following: Irish Wildlife Acts (1976 - 2012 as amended); Irish Red List for Butterfly (Regan et al. 2010); Irish Red List for Damselflies & Dragonflies (Nelson et al. 2011); Irish Red List for Amphibians, Reptiles & Freshwater Fish (King et al. 2011); Regional Red List of Irish Bees (Fitzpatrick et al. 2006); EU Habitats Directive.

BASELINE SURVEY RESULTS

Designated Sites

5.94 The proposed development site does not lie within any EU Natura 2000 site or nationally designated site (Table 5.6). the closest of the European designated sites is Deputy's Pass Nature Reserve SAC (000716) located a minimum of 1.6km from the application site. It is the only such site located within 5km of the proposed development. In all there are three SPAs located within 15km of the application site boundary (Figure 5-9).

5.95 The closest of the nationally designated sites is Glenealy Woods pNHA (001756) located 1.1km distant from the application site. There is a total of six pNHAs (and no NHAs) located within 15km of the site boundary (Figure 5-10).

5.96 All potential pathways for impact on designated sites have been evaluated in the impact assessment both within and outside of the nominal 15km buffer area around the site. This buffer area is an arbitrary distance used to display the sites most proximate to the proposed development site. However, all sites within and outside of this 15km area are considered when assessing the potential for ecological impacts arising from the proposed development. The potential for ecological effects

on sites at all distance from the proposed development are evaluated using the Source-Pathway-Receptor (S-P-R) model.

5.97 A summary of the qualifying and special conservation interests of the Natura 2000 sites located in the wider hinterland is provided in Table 5.7.

5.98 A detailed assessment of the sensitive aquatic ecological receptors within catchments/sub-catchments with hydrological links to the development site has been completed and is provided as part of the Aquatic Ecology assessment in this Chapter. The potential impacts of the proposed development on Natura 2000 sites in the surrounding area is considered in the Natura Impact Statement which accompanies the EIAR.

Table 5-6
Minimum Distances to Designated Sites from the Application Site Boundary

Site Name	Site Code	Minimum Distance (km)
European Sites		
Deputy's Pass Nature Reserve SAC	000717	1.6
Vale of Clara SAC	000733	5.5
Magherabeg Dunes SAC	001766	6.1
Buckroney-Brittas Dunes & Fen SAC	000729	6.8
The Murrough SPA	004186	7.6
The Murrough Wetlands SAC	002249	7.7
Wicklow Hd. SPA	004127	8.3
Wicklow Reef SAC	002274	9.5
Wicklow Mts. SAC	002122	11.4
Wicklow Mts. SPA	004040	12.9
Nationally Designated Sites		
Glenealy Woods pNHA	001756	1.1
Vale of Clara pNHA	000733	5.5
Avondale pNHA	002093	5.8
Magherabeg Dunes pNHA	001766	6.1
Buckroney-Brittas Dunes & Fen pNHA	000729	6.8
Wicklow Town Sites pNHA	001929	7.7
The Murrough pNHA	000730	7.7
Devil's Glen pNHA	000718	8.2
Wicklow Hd. pNHA	000734	8.2
Ballincor Wood pNHA	001749	10.4
Avoca River Valley pNHA	001748	10.5
Vartry Reservoir pNHA	001771	12.9
Arklow Sand Dunes pNHA	001746	13.1
Arklow Town Marsh pNHA	001931	14.3

Table 5-7
Summary of Qualifying and Special Conservation Interests of European Sites

Site Name and Code	Conservation Summary	Minimum Distance from Site (km)
Deputy's Pass Nature Reserve SAC (000717)	The conservation objectives of this site relate to maintaining and restoring the favourable conservation condition of the following qualifying interests; • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] Conservation Objectives updated in 2021	1.6
Vale of Clara SAC	The conservation objectives of this site relate to maintaining and restoring the favourable conservation condition of the following qualifying interests; • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] Conservation Objectives updated in 2021	5.5
Magherabeg Dunes SAC	The conservation objectives of this site relate to maintaining and restoring the favourable conservation condition of the following qualifying interests; • Annual vegetation of drift lines [1210] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Petrifying springs with tufa formation (Cratoneurion) [7220] Conservation Objectives updated in 2017	6.1
Buckroney-Brittas Dunes & Fen SAC	The conservation objectives of this site relate to maintaining and restoring the favourable conservation condition of the following qualifying interests; • Annual vegetation of drift lines [1210] • Perennial vegetation of stony banks [1220] • Mediterranean salt meadows (Juncetalia maritimi) [1410] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150] • Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] • Humid dune slacks [2190] • Alkaline fens [7230] Conservation Objectives updated in 2017	6.8
The Murrough SPA	The conservation objectives of this site relate to maintaining and restoring the favourable conservation condition of the following special conservation interests; • Red-throated Diver (*Gavia stellata*) [A001] • Greylag Goose (*Anser anser*) [A043]	7.6

Site Name and Code	Conservation Summary	Minimum Distance from Site (km)
	• Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Wigeon (*Anas penelope*) [A050] • Teal (*Anas crecca*) [A052] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Herring Gull (*Larus argentatus*) [A184] • Little Tern (*Sterna albifrons*) [A195] • Wetland and Waterbirds [A999] Conservation Objectives updated in 2024	
The Murrough Wetlands SAC	The conservation objectives of this site relate to maintaining and restoring the favourable conservation condition of the following qualifying interests; • Annual vegetation of drift lines [1210] • Perennial vegetation of stony banks [1220] • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] • Mediterranean salt meadows (Juncetalia maritimi) [1410] • Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] • Alkaline fens [7230] Conservation Objectives updated in 2021	7.7
Wicklow Hd. SPA	The conservation objectives of this site relate to maintaining and restoring the favourable conservation condition of the following special conservation interests; • Kittiwake (*Rissa tridactyla*) [A188] Conservation Objectives updated in 2024	8.3
Wicklow Reef SAC	The conservation objectives of this site relate to maintaining and restoring the favourable conservation condition of the following qualifying interests; • Reefs [1170] Conservation Objectives updated in 2013	9.5
Wicklow Mts. SAC	The conservation objectives of this site relate to maintaining and restoring the favourable conservation condition of the following qualifying interests; • Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] • Natural dystrophic lakes and ponds [3160] • Northern Atlantic wet heaths with *Erica tetralix* [4010] • European dry heaths [4030] • Alpine and Boreal heaths [4060] • Calaminarian grasslands of the Violetalia calaminariae [6130] • Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230] • Blanket bogs (* if active bog) [7130] • Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) [8110] • Calcareous rocky slopes with chasmophytic vegetation [8210]	11.4

Site Name and Code	Conservation Summary	Minimum Distance from Site (km)
	• Siliceous rocky slopes with chasmophytic vegetation [8220] • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] • *Lutra lutra* (Otter) [1355] Conservation Objectives updated in 2017	
Wicklow Mts. SPA	The conservation objectives of this site relate to maintaining and restoring the favourable conservation condition of the following special conservation interests; • Merlin (Falco columbarius) [A098] • Peregrine (*Falco peregrinus*) [A103] Conservation Objectives updated in 2024	12.9

Habitat and Botanical

5.99 The site is located in T28 (10 km Grid Square) and T28P (2km Grid Square) and T28T (2km Grid Square) encompass the site and the route of the L1157 up to the R772 junction. The botanical species recorded in these grid squares and their conservation status is presented in Appendix 5-B. No FPO species have been recorded from the overlapping grid squares (NBDC). NPWS records of rare, sensitive and invasive species were consulted via data request. There are a number of historic records of FPO species meadow saxifrage, *Saxifraga granulata* from T28. The most recent of these records dates from 1924 and from the Mizen Head area. There are local records of a Vulnerable plant species, greater broomrape, *Orobanche rapum-genistae*, including from lands north of the site at Carrigmore.

5.100 The habitat and botanical survey was carried out according to the schedule outlined in Table 5.1. The distribution of habitats identified on site is illustrated in Figure 5-11. No FPO species were recorded on site during the field surveys. The following habitats were identified on site during the survey:

- BL3 – Buildings and artificial surfaces
- ED2 – Spoil and bare ground
- ED3 – Recolonising bare ground
- ER1 – Exposed siliceous rock (or ED4 – Active quarry mines)
- FL4 – Mesotrophic lakes
- FL8 – Other artificial lakes and ponds
- GS1 – Dry Calcareous and neutral grassland
- GS2 – Dry meadows and grassy verges
- GS4 – Wet grassland
- HD1 – Dense bracken
- WD1 – (Mixed) Broadleaved woodland
- WD3 – Mixed conifer woodland
- WD5 – Scattered trees and parkland
- WN1 – Oak-birch-holly woodland
- WN6 – Wet willow-alder-ash woodland
- WS1 – Scrub
- WS2 – Immature woodland

5.101 **Buildings and Artificial Surfaces (BL3):** This habitat type is present throughout the site, but predominantly in the southeastern portion. It is present in the form of open tarmacadam and concrete areas as well as access roads, unvegetated gravel roads and buildings throughout the site. The ecological value of the buildings and artificial surfaces habitat is considered to be of negligible value.

5.102 **Spoil and bare ground (ED2):** This habitat is used to describe piles of crushed stone/gravel scattered throughout the site. The habitat is generally of negligible value.

5.103 **Recolonising bare ground (ED3):** This habitat classification is used to describe areas of bare ground and gravel that have become colonised by ruderal vegetation (Plate 5.1). A high number of plant species are present within the habitat and vegetative composition is highly variable. As such, relative abundances are not considered appropriate for the species within this habitat. The following forbs were recorded in this habitat; greater plantain *Plantago major*, ribwort plantain *P. lanceolata*, red clover *Trifolium pratense*, common centaury *Centaurium erythraea,* birds foot trefoil *Lotus corniculatus*, colts foot *Tussilago farfara*, yarrow *Achillea millefolium*, dandelion *Taraxacum officinale* agg., daisy *Bellis perennis*, creeping buttercup *Ranunculus repens*, common vetch *Vicia sativa*, thyme leaf speedwell *Veronica serpyllifolia*, selfheal *Prunella vulgaris*, weld *Reseda lutea*, teasel *Dipsacus follonum*, smooth hawksbeard *Crepis capillaris*, common hogweed *Heracleum sphondylium*, common figwort *Scrophularia auriculata*, willowherbs *Epilobium* sp., scarlet pimpernel *Anagallis arvensis*, shepherd's purse *Capsella bursa-pastoris*, procumbent pearlwort *Sagina procumbens*, lesser trefoil *Trifolium dubium*, creeping thistle *Cirsium arvense*, silverweed *Potentilla anserina*, oxeye daisy *Leucanthemum vulgare*, mouse-ear chickweed *Cerastium fontanum*, herb robert *Geranium robertianum* and smith's pepperwort *Lepidium heterophyllum*. (Plate 5-2) Some graminoids were also present and included jointed rush *Juncus articulatus*, Yorkshire fog *Holcus lanatus*, creeping bent *Agrostis stolonifera*, sweet vernal *Anthoxanthum odoratum*, ferngrass *Catapodium rigidum*. The mosses *Calliergonella cuspidatum* and *Brachythecium rutabulum* were present in the habitat. Although the habitat is quite species diverse, the habitat is considered to be of low ecological value due to the sparseness of vegetation and its inability to support a complex ecosystem. Species recorded are also all widespread and common species.

Plate 5-1
Mosaic of Recolonising Bare Ground / Hardstand Habitat in Eastern Half of Site

Plate 5-2
Smith's Pepperwort in ED3 Habitat

5.104 **Exposed siliceous rock (ER1; or ED4 – Active quarry mines):** The area of open pit excavation that dominates the northeastern portion of the site is made up of this habitat and FL8 below (where the habitat is underwater). The area mapped is indicative and continues to increase in scale due to dewatering of the quarry basin (Plate 5.3). The habitat comprises exposed bedrock from historical excavations and is understood to be composed of diorite (GSI, 2024). The habitat is largely unvegetated but has some areas ED3 vegetation (described above) and WS1 scrub (described below) scattered around its edges. It is understood that a peregrine falcon nest site is present on a cliff face within this habitat. The habitat is considered to be of low to moderate ecological value.

Plate 5-3
Exposed Siliceous Rock (Former Active Quarry).

Dewatering of the quarry basin had progressed and it was largely dry when revisited in September 2024.

5.105 **Mesotrophic lakes (FL4):** A small ephemeral pond was recorded in a depression within an area of gravel/hardstanding substrate in the northern end of the site (Plate 5.4). The habitat is likely to dry out in periods of drought and occurs here as a result of construction. The plant community occurring here comprises dominant common spike-rush *Eleocharis palustris*, frequent jointed rush, water crowfoot *Ranunculus* sp., occasional pondweed *Potamogeton* sp., and rare soft rush *Juncus effusus*. The bryophyte *Calliergonella cuspidatum* is frequent around the edges of the pond. The habitat is considered to be of moderate conservation value.

Plate 5-4
Ephemeral Pond with Tadpole Present.

5.106 **Other artificial lakes and ponds (FL8):** A large artificial water reservoir is present in the northeastern portion of the site where the quarry was historically mined. As mentioned previously, this habitat continues to decrease in extent due to it being dewatered. The edges generally have a steep incline and as such there is limited opportunity for typical freshwater benthic plants to occur. However, some stoneworts Chara sp. were recorded at the eastern end of the site (Plate 5.5). A number of other smaller settlement ponds are present in the western half of the site. These are generally more natural in nature with species such as broad-leaved pondweed Potamogeton natans being abundant, floating sweet grass Glyceria fluitans being frequent and water mint Mentha aquatica occasional. The habitat is considered to be of low conservation value as it is largely without vegetation and has an unnatural bank gradient.

Plate 5-5
Large Area of Charophyte Vegetation.

5.107 **Dry Calcareous and neutral grassland (GS1):** Small areas of semi-natural neutral grassland are present in the northwestern end of the site (Plate 5.6). This habitat seems to be occurring on what was previously bare ground habitat with a gravel substrate but has since reverted to grassland. The graminoid component of the habitat includes abundant sweet vernal grass, frequent crested dogs tail *Cynosurus cristatus*, occasional Yorkshire fog and common bent *Agrostis capillaris* with rare cocks' foot *Dactylis glomerata*. The forb component includes abundant lesser trefoil, frequent common vetch, red clover, English cinquefoil *Potentilla anglica*, occasional white clover, ribwort plantain and field forget-me-not *Myosotis arvensis*. The bryophyte *Calliergonella cuspidatum* is abundant in the habitat. The habitat is considered to be of moderate conservation value.

Plate 5-6
Small Area of Neutral Grassland at Northern End of Site

5.108 **Dry meadows and grassy verges (GS2):** A large area of dry meadow occurs in the western end of the site where former agricultural land has been allowed to become fallow Plate 5.7). The vegetation is very tall here (at least 1m high in places) as a result of not being managed. The graminoid component of the habitat includes abundant Yorkshire fog, frequent meadow foxtail *Alopecurus pratensis*, sweet vernal grass, and smooth meadow grass *Poa pratensis* with occasional cock's foot. The herb component includes frequent ribwort plantain, meadow buttercup *Ranunculus acris*, creeping buttercup, occasional creeping thistle, dandelion and greater birds foot trefoil *Lotus pedunculatus* with rare common hogweed. The habitat is considered to be of moderate conservation value.

Plate 5-7
Area of Species-Poor Dry Meadow at Western End of Site

5.109 **Wet grassland (GS4):** This habitat occurred within a few areas in the western end of the Site. The graminoid component includes abundant (to dominant) soft rush, frequent Yorkshire fog and creeping bent, occasional sweet vernal grass and compact rush *Juncus conglomeratus*, and rare common sedge *Carex nigra*, and oval sedge *C. leoporina*. Forbs present include frequent lesser spearwort *Ranunculus flammula* and creeping buttercup, occasional cuckoo flower *Cardamine pratensis*, marsh bedstraw *Galium palustre*, greater birds foot trefoil and rare common sorrel Rumex *acetosa*. A species of horsetail, great horsetail *Equisetum telmateia*, was rare in the habitat but locally abundant where it occurred (Plate 5-8). The habitat is considered to be of moderate conservation value.

Plate 5-8
Area of Abundant Great Horsetail within Wet Grassland Habitat

5.110 **Dense bracken (HD1):** A small area of bracken habitat occurs at the northern end of the site. At the time of survey the bracken was not at its maximum canopy extent and as such a number of other species were still visible/noticeable within the habitat at the time of survey. Bracken *Pteridium aquilinium* dominates the habitat. Bramble *Rubus fructicosus* agg. is abundant, Yorkshire fog is frequent, cleavers *Galium aparine* are occasional and greater stitchwort *Stellaria holostea* is rare within the habitat. The habitat is considered to be of low-moderate conservation value.

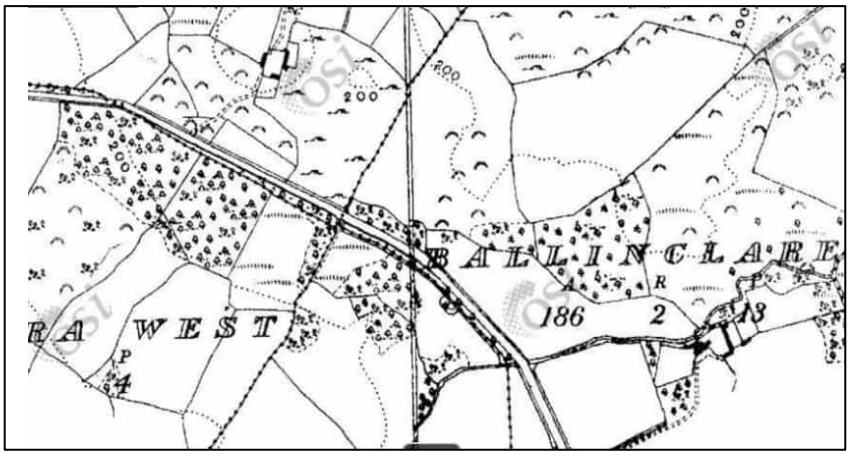
5.111 **(Mixed) broadleaved woodland (WD1):** A small area of mixed broadleaved woodland occurs along the site southeast boundary. The habitat comprises mature dominant beech *Fagus sylvatica* trees between 15m and 20m in height with occasional sycamore *Acer pseudoplatanus* and scattered holly *Ilex aquilinium* and elder *Sambucus nigra* in the shrub layer. The ground layer comprises dominant ivy *Hedera helix*, frequent germander speedwell *Veronica chamaedrys*, bluebells *Hyacanthoides* sp. occasional greater stitchwort, pignut *Conopodium majus* and woodsage *Teucrium scorodonia* with rare scaly male fern *Dryopteris affinis*. A larger area of this habitat is present along the Sites southern boundary. It primarily consists of ash *Fraxinus excelsior* and was likely planted for timber. The understorey is dense with scrub and mostly consisting of dominant bramble and scattered gorse and ivy around the edges. The majority of the ash trees here are infected with ash dieback *Hymenoscyphus fraxineus*. The habitat is considered to be of moderate conservation value.

5.112 **Mixed conifer woodland (WD3):** A strip of mixed conifer woodland occurs along the entrance into the site. The habitat is comprised of tall, dominant sitka spruce *Picea sitchensis*, occasional sycamore and occasional grey willow *Salix cinerea* and rare hawthorn *Crataegus monogyna* in the understorey. The habitat is considered to be of low conservation value.

5.113 **Scattered trees and parkland (WD5):** A small area of trees surrounding old buildings near the centre of the site is best described and mapped under this habitat. Tree species recorded within the habitat include ash, leyland cypress *Cupressus x leylandii*, lyme *Tilia* sp., goat willow *Salix caprea*, holly, yew *Taxus baccata* and cherry laurel *Prunus laurocerasus*. The habitat is considered to be of low – moderate conservation value.

5.114 **Oak-birch-holly woodland (WN1):** Along the site's southern boundary and immediately east of the entrance to the site an oak woodland part of which was present since at least the 1830's (Geohive, 2024; see Plate 5.9 below). The canopy is comprised of abundant sessile oak *Quercus petraea* with frequent beech and locally frequent grey willow in wet areas and along the southern edge of the habitat (Plate 5-10). The shrub layer includes frequent holly and rare elder, hawthorn, hazel *Corylus avellana* and rowan *Sorbus acucuparia*. It also includes the following non-native negative species; frequent cherry laurel and rare butterfly bush Buddleja davidii and sycamore. Cherry laurel is frequent while the other two species are rare in the shrub layer. The field layer (Plate 5-11) includes dominant ivy, frequent bramble, occasional wood sanicle *Sanicula europea*, common dog violet *Viola riviniana*, soft shield fern *Polystichum setiferum*, honeysuckle *Lonicera periclymenum*, scaly male fern and pignut. Rare selfheal *Prunella vulgaris*, false Wood-brome *Brachypodium sylvaticum*, black spleenwort *Asplenium adiantum-nigrum*, wood sorrel *Oxalis acetosella*, hard fern *Blechnum spicant* and remote sedge *Carex remota* were also recorded in the field layer. The following bryophytes were recorded in the field layer; abundant *Eurrhynchium striatum*, frequent *Thuidium tamariscanum* and rare *Fissidens* sp., *Hookeria lucens* and *Atrichum undulatum*. The epiphytes *Metzgeria furcata, M. fruticulosa, Ulota phyllantha, Ulota* sp. (other species), *Microlejeuna ulicina, Frullania dilitata, Hypnum* sp., *Cryphaea heteromalla* were recorded growing on trees within the habitat. The habitat is considered to be of high conservation value.

Plate 5-9
Strip of Woodland Present in 1830s, Adjacent to Road



Woodland present where WN1 habitat currently exists

Plate 5-10
Canopy of WN1 Habitat with Oak Visible

Plate 5-11
Understorey and Field Layer of WN1 Habitat

5.115 **Wet willow-alder-ash woodland (WN6):** Some wet woodland is present at the western end of the site. The woodland comprises a grey willow dominated canopy about 6m tall. A shrub layer was not very evident while the following species were recorded in the field layer; tutsan *Hypericum androsaemum*, creeping buttercup, common male fern *Dryopteris felix-mas*, marsh bedstraw, bramble, ivy, dock, *Rumex* sp., nettle *Urtica dioica*, wild Angelica *Angelica sylvestris*. The bryophytes *Atrichum undulatum* and *Polytrichum formosum* were also recorded in the field layer. The habitat is considered to be of moderate conservation value.

5.116 **Scrub (WS1):** Scrub habitat is present throughout the site in the form of continuous, solid thickets and also as scattered scrub bordering other habitats. Gorse is abundant in the habitat and bramble is also frequent to abundant. Grey willow, butterfly bush and silver birch *Betula pendula*, and elder were also common components of this habitat. The habitat is considered to be of low to moderate conservation value.

5.117 **Immature woodland (WS2):** A small stand of woodland best classified under this category is present in the middle of dry meadow habitat at the western end of the site. The stand is dominated by silver birch but also has occasional alder *Alnus glutinosa* and gorse with rare butterfly bush. The habitat is considered to be of low to moderate conservation value.

5.118 Habitats within the site are variable and include both semi-natural habitats, such as the woodland, grassland and bracken habitat, as well as artificial habitats such as the exposed siliceous rock (formerly quarry), reservoirs of water throughout the site, buildings and hardstanding/bare ground surfaces. A broad evaluation of each habitat has been given above in the habitat description sections which gives them an estimated conservation value (negligible – low – moderate – high). This has largely been based on level of naturalness as well as species richness and ability to support other taxonomic groups. In a geographical context the majority of these habitats are only considered to be of local importance.

5.119 The WN1 (Oak–birch–holly) woodland is the only habitat that has been considered to be of high conservation significance. This habitat corresponds with the Annex I habitat (EU Habitats Directive) old sessile oak woods with *Ilex* and *Blechnum* in the British Isles (91A0). The area of this habitat within the site is approximately 0.5ha although some of this includes unmapped waterbodies and willow areas around the edges that could be considered wet woodland (WN6). However, these have been excluded from the area in which this habitat is mapped due to their size. The habitat is considered to be in reasonable condition although it is at an early stage of infestation by invasive cherry laurel, which has the potential to greatly reduce the quality of this habitat within the site. Beech also has the potential to change this habitat into a different woodland type if it were allowed to spread and outcompete the sessile oak. This habitat is considered to be of national importance as they are listed in Annex I of the Habitats Directive. It is unlikely to include habitat of international importance as (in the author's opinion) it does not include the ''best examples of the habitat types listed in Annex I of the Habitats Directive'' (NRA, 2009). No other habitats on Site are considered to correspond to an Annex habitat.

5.120 A follow-up site visit in September 2024 was carried out to record late flowering species and to supplement earlier checks along the margins of the L1157. Eight locations for broad-leaved helleborine *Epipactis helleborine* were identified within or adjacent to the site (Plate 5.12). This totalled in eighteen individual plants with quantities of plants at a single location ranging from individual plants to a grouping of three, six or nine plants. Their locations are shown in Plate 5.12 below and photographs for each location are provided in Appendix 5-C. None of the plants were flowering at the time of survey although many had 'gone to seed'. Much of the roadside along the L1157 had been recently cut and this will have diminished the likelihood of recording more specimens. The species is not protected under the Flora (Protection) Order 2022 or any Annex of the Habitats Directive and is considered of Least Concern on the Irish Red List No. 10: Vascular Plants (Wyse Jackson et. al, 2016).

5.121 A thicket of the invasive rhododendron *Rhododendron ponticum* was recorded (between T 24793 88905 and T 24833 88900) in the southwest corner of the site (see Plate 5.13, Appendix 5-D).

Plate 5-12
Recorded Locations of Broad-leaved Helleborine On / Adjacent to Site

(recorded in September 2024)

Plate 5-13
Patch of Rhododendron at Southwest of Application Site

5.122 The margins of the L1157 road up to R772 junction were surveyed on several occasions between May and September 2024 (Table 5.1; Figure 5-12) and the primary habitats adjoining the road corridor were noted. The most common habitat type along the road corridor consisted of mature treelines (WL2). Hedgerows (WL1) and Ornamental/NonNative Shrub (WS3) bordered the road margins along private gardens and field boundaries. Buildings and artificial surfaces (BL3) habitat is associated with the M11 underpass and pedestrian footpaths, with Dry meadows and grassy verges (GS2) and a small patch of Scrub (WS1) in close proximity, along the southern section of the road corridor. More Buildings and artificial surfaces (BL3) and Dry meadows and grassy verges (GS2) habitat were recorded at the southern section of the L1157 Road, at the R772 junction.

5.123 The L1157 is bordered by swales in places, particularly along the northern section, which connect to field drains in the neighbouring fields. The road crosses the Ballinameesda Lower watercourse, a narrow stream, via a culvert (ITM 725499 688530).

5.124 Invasive species encountered as part of the walkover include giant rhubarb (*Gunnera tinctoria*), Cherry Laurel, Snowberry (*Symphoricarpos albus*), and Traveler's joy (*Clematis vitalba*). Two small patches of giant rhubarb were recorded growing along a treeline. This species, along with *Rhododendron ponticum* is listed on the Third Schedule of the 2011 European Communities (Birds and Natural Habitats) Regulations (i.e. species of which it is an offense to disperse, spread or otherwise cause to grow in any place). This species has been classified as being a 'risk of high impact' invasive species (Kelly *et al*, 2013).

5.125 Cherry Laurel was primarily recorded as unmanaged planted ornamental hedging along sections of the road corridor but was also recorded coming up through the treeline along several road sections. This species has been classified as being of as a 'risk of high impact' invasive species (Kelly *et al*, 2013). Snowberry was recorded on the southern section of the road corridor and is classified as being of low risk of impact. Traveler's Joy, which was recorded within a patch of scrub habitat along the south section of the road corridor, is classified as being of risk of medium impact.

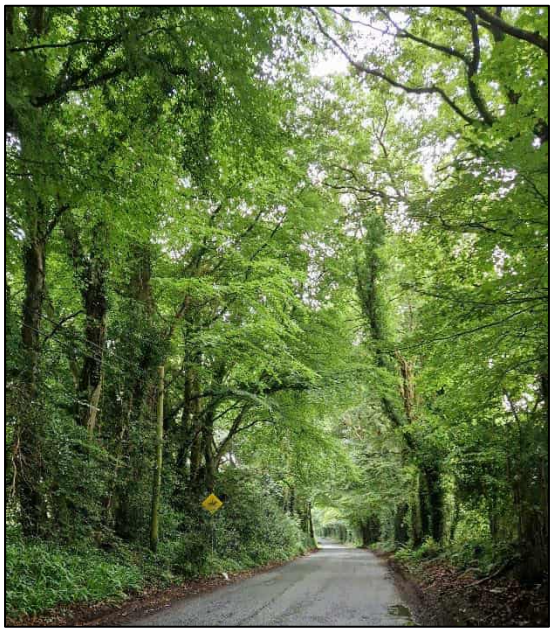
5.126 Sycamore, which was common along the road corridor, is classed as a as 'risk of medium impact' invasive species and is widespread and naturalised throughout the Irish landscape. The locations of invasive species are recorded in Table 5.8.

Table 5-8
Invasive Species Recorded Along L1157 Corridor to R772 junction

Name	Species Name	X (ITM)	Y (ITM)
Cherry Laurel	*Prunus laurocerasus*	725451	688584
Cherry Laurel	*Prunus laurocerasus*	725426	688615
Snowberry	*Symphoricarpos albus*	726053	687838
Traveller's Joy	*Clematis vitalba*	726122	687789
Cherry Laurel	*Prunus laurocerasus*	725395	688645
Cherry Laurel	*Prunus laurocerasus*	725337	688700
Cherry Laurel	*Prunus laurocerasus*	725283	688734
Giant Rhubarb	*Gunnera tinctoria*	725920	687955
Giant Rhubarb	*Gunnera tinctoria*	725918	687953
Cherry Laurel	*Prunus laurocerasus*	725911	687972
Cherry Laurel	*Prunus laurocerasus*	725818	688091
Cherry Laurel	*Prunus laurocerasus*	725777	688145
Cherry Laurel	*Prunus laurocerasus*	725499	688530
Cherry Laurel	*Prunus laurocerasus*	725469	688564
Cherry Laurel	*Prunus laurocerasus*	726501	687596
Cherry Laurel	*Prunus laurocerasus*	725933	687932

5.127 **Treelines (WL2):** Long sections of the L1157 road were bounded by mature treelines dominated by deciduous tree species, often accompanied by dense hedgerow/understory layer (Plate 5.14). These mature treelines contained a range of species including frequent beech, ash and sycamore, along with occasional oak (*Quercus robur*). Where the treeline thinned out, willow (*Salix* spp.) was frequently recorded, accompanied by abundant meadowsweet (*Filipendula ulmaria*). Other species recorded occasionally include elder, dog rose (*Rosa canina*) and birch (*Betula* spp.). The understory layer frequently contained holly, hawthorn and blackthorn (*Prunus spinosa*). Other vegetation recorded included frequent bramble, honeysuckle (*Lonicera periclymenum*), nettle, herb robert (*Geranium robertianum*), cleavers, dock, ivy, common vetch (*Vicia sativa*), common hogweed, black medick (*Medicago lupulina*) and germander speedwell (*Veronica chamaedrys*), along with occasional wood sage (*Teucrium scorodonia*), wood avens (*Geum urbanum*) and enchanter's nightshade (*Circaea lutetiana*). The ecological valuation of this habitat is considered to be of local importance (higher value).

Plate 5-14
Treeline (WL2) Habitat Dominated by Mature Beech (left) and Willow (right)



5.128 **Hedgerow (WL1):** This habitat type was recorded alongside the road margins primarily along the southern section of the road corridor, and consisted of frequent hawthorn, blackthorn, dog rose and bracken (Plate 5.15). A section of hedgerow, managed as a ‘box hedge’, was recorded along the northern section of the road corridor and included frequent beech, with occasional holly, oak, ivy and rowan (*Sorbus aucuparia*) coming through. The ecological valuation of this habitat is considered to be of local importance (higher value).

5.129 **Ornamental/Non-Native Shrub (WS3):** This habitat type consisted of stands of cherry laurel planted on the roadside margins of private lands along the road corridor (Plate 5.16). This habitat was recorded on a number of occasions with some stands of cherry laurel more established and unmanaged than others. Other non-native species recorded occasionally include montbretia (*Crocosmia* × *crocosmiiflora*), snowberry, and fuchsia (*Fuchsia magellanica*). Other species recorded include dogwood (*Cornus* spp.) ragwort (*Senecio jacobaea*), ash, bramble, nettle and spurge (*Euphorbia* spp.). The ecological valuation of this habitat is considered to be of local importance (lower value).

Plate 5-15
Hedgerow (WL1) Habitat

Hedgerow managed as a 'box hedge' (left) and under less management (right).

Plate 5-16
Ornamental / Non-Native Shrub (WS3) Consisting Mostly of Cherry Laurel.

5.130 **Buildings and artificial surfaces (BL3):** This habitat consists of the M11 underpass under which the road corridor passes to the south. Included are pedestrian footpaths which border the road corridor as it passes beneath the M11 underpass (Plate 5.17). Few species were recorded here and were typically confined to the outer edges of the underpass. Species recorded occasionally include ragwort, herb robert, common daisy, dandelion, hawk bit (*Leontodon* spp.) and fleabane (*Pulicaria dysenterica*). The ecological valuation of this habitat is considered to be of negligible importance.

Plate 5-17
Buildings and Artificial Surfaces (BL3)

5.131 **Dry meadows and grassy verges (GS2):** This habitat type was recorded on the approach to the M11 underpass (Plate 5.18). Species recorded included frequent cocksfoot, perennial ryegrass (*Lolium perenne*), meadow foxtail (*Alopecurus pratensis*), yorkshire fog, ragwort, bramble, nettle, cleavers, dock, common vetch, bristly oxtongue (*Helminthotheca echioides*), selfheal (*Prunella vulgaris*), dandelion, common daisy, greater birdsfoot trefoil (*Lotus pedunculatus*), common rush, creeping buttercup, coltsfoot, crested dog tail (*Cynosurus cristatus*) and hedge bindweed (*Calystegia sepium*). The ecological valuation of this habitat is considered to be of local importance (lower value).

Plate 5-18
Dry Meadow and Grassy Verges along the L1157 Near M11 Underpass

5.132 **Scrub (WS1):** This habitat type was recorded in a small patch where the hedgerow had transitioned and expanded along the edge of farmland, encroaching on the road corridor adjacent to the M11 underpass (Plate 5.19). Species recorded included frequent bramble, gorse (*Ulex europaeus*), ribwort plantain, traveler's joy, as well as occasional dog rose, hawthorn, blackthorn, and elder. The ecological valuation of this habitat is considered to be of local importance (lower value).

Plate 5-19
Patch of Scrub (WS1) Habitat Near M11 Underpass

Patch occurs along the south section of the road corridor

Non-volant Mammals

5.133 The NBDC records for the 2km Grid Squares that overlap the site and the access route along the L1157 to the R772 were collated. Table 5.9 shows the non-volant mammal species recorded historically in T28P and T28T. The species recorded include Badger, *Meles meles*, Stoat, *Mustela erminea* subsp. *hibernica* and Pine Marten, *Martes martes*. Table 5.9 also shows the current conservation status of these species.

5.134 Data from NPWS on sensitive, protected and invasive species located historically within the T28 Grid Square confirms the presence of Sika Deer, *Cervus nippon*, Fallow Deer, *Dama dama*, Irish Hare, *Lepus timidus hibernicus*, Hedgehog, *Erinaceus europaeus*, Stoat and Otter.

5.135 Walkover surveys of the site and along the proposed primary access route recorded signs of several mammal species. However, no setts or holts were located within the application site. The most abundantly recorded non-volant species on site was Rabbit, *Oryctolagus cuniculus* with direct sightings of only three further species, Brown Rat, *Rattus norvegicus* Sika Deer and Irish Hare. Rabbits were relatively common on site. The Hare sighting was made on June 4th from near the existing weighbridge. No other sightings or signs were made of Hare on site and they were not recorded on any of the trail cameras deployed. Deer tracks were recorded widely and throughout the survey period, within the site and along the L1157. There were a number of sightings of Sika Deer in the course of the site walkovers. Site staff confirmed that Sika Deer are seen regularly within the site. The abundance of

deer and conflicts with agriculture, silviculture and road safety were all communicated during the public consultation on this project.

5.136 Badger digging and latrines were recorded near the settlement ponds and along the track at the south-southwest of the site in April, June and July 2024. No active sett was recorded within the application footprint.

5.137 Signs of Fox, *Vulpes vulpes* (scat and digging) were frequent and widespread within the site. A number of old burrows including an inactive den were located in woodland outside the eastern boundary of the application during walkovers in June 2024. Fox signs (including scent) were recorded at several locations along the L1157 but no burrows of any non-volant mammal species were observed along the margin of the public road.

5.138 Pine Marten scat was recorded at several locations throughout the site and checks of the unoccupied redbrick house on-site confirmed it had been used by Pine Marten in the past. It was likely used as a breeding site and there was an accumulation of old droppings and feeding signs recorded inside the house in April 2024. A dead Pine Marten was recorded on the L113 road near the junction with the L1157 on July 24th 2024. A Pine Marten scat was recorded c. 1km east of the quarry entrance on a stone near the edge of the road during initial checks of the roadside margin in March 2024.

5.139 A Red Squirrel, *Sciurus vulgaris*, was observed during bird survey Point Counts (at PC2) in May 2024 west of the M11.

Table 5-9
Non-volant Mammals Recorded Historically in 2km Grid Squares T28P / T28T

Common Name	Scientific Name	Conservation Status
Brown Rat	*Rattus norvegicus*	Invasive Species
Eastern Grey Squirrel	*Sciurus carolinensis*	Invasive Species
Eurasian Badger	*Meles meles*	WA, lc
Irish Stoat	*Mustela erminea* subsp. hibernica	WA, lc
Pine Marten	*Martes martes*	Annex V status, WA, lc
Hedgehog	*Erinaceus europaeus*	WA, lc

* Key : Annex Status (EU Habitats Directive)
WA (Protected under Wildlife Act 1976) lc – Least Concern, NT – Near Threatened.

5.140 Several obvious mammal crossing points were recorded along the L1157 and deer tracks were present at several locations on the margins of the road.

5.141 Otter signs were not recorded within the site, but an Otter has been previously observed on-site by site staff. It is likely that Otters may exploit seasonal feeding opportunities e.g. during the Frog spawning season. However, no sprainting site was recorded during the field surveys on site and Otters were not recorded during the trail camera study. An Otter spraint was recorded on a rock in the Potters River near the junction of the R772 and L1157 in June 2024. No further signs of Otter were recorded during the dedicated aquatic ecology surveys in the wider area.

5.142 The analysis of the trail cameras deployed on site is summarised in Table 5.10. Fox and Sika Deer were the most widely and frequently recorded species at the site. Sika Deer was recorded at 15 of the 19 deployment locations. Given that one of those locations without any 'triggers' was from inside the redbrick house (TC19), it highlights how common and widespread Sika Deer are at the site. Fox was recorded at 10 of the 19 deployment locations. Adult and young Sika Deer were observed but only adult Foxes were observed on the camera record. Badger was recorded at five of the camera locations, but the observations appeared to be of animals commuting through the site. Single individuals were recorded and no cubs were noted on any of the photos. Pine Marten was recorded at three of the camera locations although this species, like Red Squirrel, is often underrepresented in the trail camera record due to their arboreal nature. The were multiple nighttime triggers at TC12 of a small mammal, most likely a Field Mouse, *Apodemus sylvaticus*.

5.143 No Hedgehog, Erinaceus europaeus sightings or trail camera images were recorded. However, the species is known to occur locally and is likely to be present, at least occasionally. Similarly, although Stoat, Mustela erminea hibernica, was not recorded they are likely to be present in the area.

5.144 A selection of the trail camera images is provided in Appendix 5-E.

5.145 None of the mammals recorded at the site are considered of conservation concern in Ireland (Marnell et al. 2019). Sika Deer is considered a high impact invasive species (NBDC).

5.146 The site is assessed as being of local importance (higher) for non-volant mammals. The site currently lacks breeding sites of protected mammal species. However, it is used by foraging and commuting species and may occasionally be exploited by Otter. There is a range of habitat present which provide some foraging, resting and breeding opportunities for species including Badger and Pine Marten

Table 5-10
Trail Camera Record of Mammals and Birds at Site in 2024
(Counts at camera deployments with discontinuous recording indicated by x/x).

Species	TC1	TC2	TC3	TC4	TC5	TC6	TC7*	TC8	TC9	TC10	TC11	TC12	TC13	TC14	TC15	TC16*	TC17	TC18	TC19
Mammals																			
Badger	2					15			7			3	10						
Brown Rat												59	3						
Dog	3/4				1	1			2		5								
Fox	3/4			9	6	9			5		8	27	24	16	6/4		12		
Pine Marten	0/1											3					1		
Rabbit													5		7/4		40		
Sika Deer	9/27			5	5	1	7	2	3	1	62	7	1	8	2/0	1		21	
Small unid. Mammal												35							
Birds																			
Blackbird	0/1			16		6		2				151	5	1			2		
Blackcap											3	1							
Blue Tit						1						1							
Bullfinch							3				1	2							
Buzzard	0/1										2								
Chaffinch											1								
Coal Tit		1																	
Dunnock				2								19							
Great Tit											1								
Grey Heron	0/2	7	8								15								
Hooded Crow				1									1				34		
Jackdaw																	2		
Jay						1													

Species	TC1	TC2	TC3	TC4	TC5	TC6	TC7*	TC8	TC9	TC10	TC11	TC12	TC13	TC14	TC15	TC16*	TC17	TC18	TC19
Mallard		1	1																
Moorhen			5																
Raven																	3		
Redwing						1													
Robin				1	1					2		41							
Sedge Warbler			1																
Song Thrush				5		3						18				1			
Swallow								1											
Woodpigeon	8/25			3		4	3	3	3		4		5	1	0/2				
Wren												2							
Yellowhammer				1								3							

* The deployments at TC7 and TC16 were constrained by interference by deer and by the growth of vegetation obscuring the viewshed respectively

Bats

5.147 A review of the historical records of bats from the 2km Grid squares that overlap the site and the access route from the site along the L1157 to the junction with the R772 (Table 5.11). This indicates that six bat species have been recorded in the area including Common Pipistrelle, *Pipistrellus pipistrellus*, Soprano Pipistrelle, *Pipistrellus pygmaeus*, Daubenton's Bat, *Myotis daubentonii*, Natterer's Bat, *Myotis nattereri*, Leisler's Bat, *Nyctalus leisleri* and Brown Long-eared Bat, *Plecotus auritus*.

5.148 Bat landscape suitability scores for this area are relatively high (39.89) and especially high for Natterer's Bat (69), Common Pipistrelle (62) and Leisler's Bat (60).

5.149 The Bat Conservation Ireland (BCI) data also confirms roost records of Whiskered Bat, *Myotis mystacinus* within 10km of the application site.

Table 5-11
Bat Species Recorded Historically in the Local Area (NBDC).

Common Name	Scientific Name	Conservation Status	Grid Squares
Brown Long-eared Bat	*Plecotus auritus*	Annex IV status, WA, lc	T28P, T28T
Common Pipistrelle	*Pipistrellus pipistrellus*	Annex IV status, WA, lc	T28P, T28T
Daubenton's Bat	*Myotis daubentonii*	Annex IV status, WA, lc	T28P, T28T
Leisler's bat	*Nyctalus leisleri*	Annex IV status, WA, lc	T28P, T28T
Natterer's Bat	*Myotis natteri*	Annex IV status, WA, lc	T28T
Soprano Pipistrelle	*Pipistrellus pygmaeus*	Annex IV status, WA, lc	T28P, T28T

5.150 BCI data on confirmed historical bat roosts confirms the presence of a number of bat roosts in the local area. Exact locations are not provided due to the sensitivity of this information. Approximate roost locations are mapped in Figure 5-13. The record includes a roost of Leisler's Bat, Brown Long-eared Bat, Pipistrelle sp. and another unidentified species from close to the application site. There is another historic roost from Magheramore south of the site, with the roost containing Brown Long-eared Bat, Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat and Daubenton's Bat. There is also a separate roost record of Common Pipistrelle roost from Magheramore.

5.151 Buildings on site were inspected for evidence of any current or historic bat roost. A limited number of old droppings were recorded in the attic space in of the unoccupied red-brick house. However, there was no evidence of any current or recent usage and bat detector deployed internally confirmed the lack of bat activity from within the structure. As described above there was also evidence of historic Pine Marten activity in this building. No evidence was recorded of any current or historic roost within these buildings.

5.152 Emergence surveys were carried out in June and July 2024 ahead of the driven transects along the L1157 (Table 5.1). Observers were equipped with handheld detectors (Wildlife Acoustic EMT Pro2 and Batlogger M2) and high-power torches. Surveys began a minimum of 15 minutes before sunset until at least 90 minutes after sunset. No evidence of roost emergence was recorded on either occasion. Common Pipistrelle was observed on both occasions with several individuals recorded foraging along the edge of the treeline to the south of the unoccupied redbrick house on 27th June. A commuting Leisler's Bat was recorded on the same survey occasion with the bat passing over the top of the house. On the 17th July (sunset 21:40) there was no activity detected until 22:04 when c. 3 Pipistrelle species were observed foraging to the west of the unoccupied house. Both Common and Soprano Pipistrelle were present but no bats were observed leaving or entering any of the structures. After a period of activity no further bat activity was detected beyond 22:10.

5.153 Trees to be felled as part of the proposed development were surveyed for ground level to assess the roost potential of these trees. The conifer line to the west of the existing site access road are mature but lack any significant Potential Roost Features (PRFs). Similarly, the Ash trees with ash dieback disease have low potential for roosting bats, lacking visible cracks, hollows and ivy cover. None of these trees present were adjudged to have high potential for roosting bats.

5.154 The analysis of the passive bat detectors deployed at the site is summarised in Table 5.12. Over 21,600 calls were recorded and analysed. Five species were confirmed to be present on site, Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat, Daubenton's Bat, Natterer's Bat and Brown Long-eared Bat. In addition, a small number of calls could not be identified to species and were categorised as either 40/50kHz Pipistrelle species or *Myotis* sp.

5.155 Overall, the activity recorded was dominated by Common Pipistrelle (58.9% of total calls analysed) followed by Soprano Pipistrelle (19.4%) and Leisler's Bat (18.2%). All of the Myotids accounted for only 2.7% of the registrations. Brown Long-eared Bat was infrequently recorded although detected at 10 of the deployment locations.

5.156 Common Pipistrelle was recorded at every deployment location except from within the unoccupied redbrick house. There were a small number of registrations of Common Pipistrelle made from a detector deployed within a stone shed although it was not possible to definitively state that these were of bats entering the building (perhaps as a night roost) or of bats calling from directly above the corrugated roof. No signs of bats were recorded within the shed and the building would currently be unattractive as a day roost for bats.

5.157 The locations with the greatest levels of bat activity were recorded at BD5 and BD7, both locations in woodland at the south-southeast of the site. Adjusting for the variable length of the deployment the average number of nightly registrations was slightly higher at BD7 (average of 222 nightly registrations) than at BD5 (average of 198 nightly registrations). Although the cumulative total of bat calls, particularly of Common Pipistrelle recorded at these locations appears large it is a fairly low-moderate rate of registrations for a woodland site in Ireland (G. Fennessy pers obs.).

5.158 The three most frequently recorded species accounted for 96.5% of the total calls analysed and these species, Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat, are the three most common bat species in Ireland.

Table 5-12
Analysis of Passive Bat Detectors Deployed at Proposed Development Site.

Species	BD1	BD2	BD3	BD4	BD5	BD6	BD7	BD8	BD9	BD10	BD11	BD12	BD13
Common Pipistrelle	724	85	617	60/102	4603	560	3461	79	16		1354	326	785
Soprano Pipistrelle	575	25	279	29/290	1159	71	909	31			403	198	235
40/50kHz Pipistrelle		3	4	0/6	9		13				5		4
Leisler's Bat	70	478	286	18/68	1492	28	784	108	3		206	130	271
Myotis sp.	5	4	6	0/18	125	7	33	7			5	8	18
Daubenton's Bat	20	3	20	5/31	105		87				36	16	
Natterer's Bat						4	6					7	
Brown Long-eared Bat	2	1	4	4/4	64	4	42	2			11		2

The number of identified calls of each taxa at each deployment location is shown.

The results of analysis of discontinuous recording periods at the same deployment location are indicated by the format x/x.

5.159 Very little bat activity was recorded on the active driven transects between the site entrance, along the L1157 to the junction of the R772. This transect was surveyed on three occasions from March to July 2024. Table 5.13 summarises the results with the total number of registrations detected on each survey occasion. In all, four bat taxa were registered along the route with Myotis sp. detected just east of the site entrance on March 26th and faint calls recorded at two locations closer to the M11 on the night of the 27th June 2024. Common Pipistrelle was clearly the most frequently encountered species on each survey occasion although the rate of detections was not particularly high, especially considering the 'triggers' tended to occur in clusters where one or more individuals were feeding along the road corridor. There was no consistent locus of activity along the driven transect.

Table 5-13
Bat Species / No. of Registrations Recorded on Driven Transects on L1157

Species	Scientific Name	26/03/2024	27/06/2024	17/07/2024
Common Pipistrelle	*Pipistrellus pipistrellus*	5	21	18
Leisler's Bat	*Nyctalus leisleri*		10	5
Soprano Pipistrelle	*Pipistrellus pygmaeus*		3	2
Myotis sp.	*Myotis* sp.	1	2	

5.160 The site contains some attractive foraging and potential roosting habitat for bats. No active bat roosts were present, but it is known that there are known roosts of several of the species registered in the local area. The woodland that fringes the site and the woodland and hedgerows along the L1157 are also suitable for commuting and foraging bats. The level of activity recorded on the site was relatively modest at most locations and times of year. The quarry basin and yard lack vegetative cover and are of low value for bats. Overall, the site is evaluated as of local importance (higher value).

Birds

5.161 A desktop review of the bird species found in the local area was carried out with the species recorded historically in the 2km Grid Squares which overlap the site and along the access route from L1157 to R772 collated in Table 5.14. A total of 51 species have been recorded historically in this area (NBDC database). The majority of these species are common birds of farmland and woodland, locally and nationally.

5.162 Five of the species recorded locally are listed on Annex I of the EU Bird's Directive: Balearic Shearwater, *Puffinus mauretanicus*, Kingfisher, *Alcedo atthis*, Woodcock, *Scolopax rusticola*, Red Kite, *Milvus milvus* and Peregrine Falcon. Table 5.14 also highlights the current status of each species according to the Birds of Conservation Concern in Ireland (2020-2026) list (Gilbert *et al*. 2021). Six species are currently red-listed: Balearic Shearwater, Grey Wagtail, *Motacilla cinerea*, Kestrel, *Falco tinnunculus*, Red Kite, Woodcock and Yellowhammer, *Emberiza citrinella*. A further nine species recorded historically in the area are amber-listed (of moderate conservation concern) including Kingfisher. While Peregrine Falcon is listed on Annex I of the Bird's Directive it is not considered to be of elevated conservation concern in Ireland where the number of breeding pairs has substantially increased over the past 50 years.

5.163 The Balearic Shearwater is critically endangered globally, with a small and rapidly declining population. It is red-listed due to its severe conservation status internationally, making it one of the most threatened seabirds in Europe. It would not be expected to occur inland with any regularity and this record is not of any biological significance.

5.164 The Kestrel is red-listed due to recent declines in its breeding population in Ireland.

5.165 The Woodcock is red-listed because of significant declines in the wintering population in Ireland and wider Europe.

5.166 The Grey Wagtail is red-listed due to significant declines in both the breeding and wintering populations. It is a species that lives alongside watercourses.

5.167 The Red Kite is red-listed in Ireland because its breeding population remains relatively small and vulnerable after reintroduction. However, there is a likelihood that based on the continued success of the reintroduction efforts that the conservation outlook for the species in Ireland will be assessed more positively in the future.

5.168 The Yellowhammer is red-listed due to severe declines in its breeding population in Ireland, especially in western and southern regions. It is a granivorous species that remains locally common in areas with arable crops and less intensive improved agricultural grassland.

Table 5-14
Bird Species Recorded in Area / Current Conservation Status

Common Name	Scientific Name	Grid Square
Balearic Shearwater*+	*Puffinus mauretanicus*	T28T
Blackbird	*Turdus merula*	T28P
Blackcap	*Sylvia atricapilla*	T28P
Blue Tit	*Cyanistes caeruleus*	T28P
Brambling^	*Fringilla montifringilla*	T28P
Bullfinch	*Pyrrhula pyrrhula*	T28P
Buzzard	*Buteo buteo*	T28P & T28T
Chaffinch	*Fringilla coelebs*	T28P
Chiffchaff	*Phylloscopus collybita*	T28P & T28T
Coal Tit	*Periparus ater*	T28P
Crossbill	*Loxia curvirostra*	T28P
Dunnock	*Prunella modularis*	T28P & T28T
Goldcrest^	*Regulus regulus*	T28P
Goldfinch	*Carduelis carduelis*	T28P
Grasshopper Warbler	*Locustella naevia*	T28P
Great Spotted Woodpecker	*Dendrocopos major*	T28P & T28T
Great Tit	*Parus major*	T28P
Greenfinch^	*Carduelis chloris*	T28P
Grey Wagtail*	*Motacilla cinerea*	T28P
Hooded Crow	*Corvus cornix*	T28P
House Martin^	*Delichon urbicum*	T28P

Common Name	Scientific Name	Grid Square
Jackdaw	*Corvus monedula*	T28P
Jay	*Garrulus glandarius*	T28P
Kestrel*	*Falco tinnunculus*	T28P & T28T
Kingfisher^+	*Alcedo atthis*	T28P
Little Grebe	*Tachybaptus ruficollis*	T28P
Long-tailed Tit	*Aegithalos caudatus*	T28P
Magpie	*Pica pica*	T28P
Mallard^	*Anas platyrhynchos*	T28P
Mistle Thrush	*Turdus viscivorus*	T28P
Moorhen	*Gallinula chloropus*	T28P
Peregrine Falcon+	*Falco peregrinus*	T28P
Pheasant	*Phasianus colchicus*	T28P
Pied Wagtail	*Motacilla alba*	T28P
Raven	*Corvus corax*	T28P & T28T
Red Kite*+	*Milvus milvus*	T28P
Reed Bunting	*Emberiza schoeniclus*	T28P
Robin	*Erithacus rubecula*	T28P
Rock Dove	*Columba livia*	T28P
Rook	*Corvus frugilegus*	T28P
Siskin	*Carduelis spinus*	T28P
Song Thrush	*Turdus philomelos*	T28P
Sparrowhawk	*Accipiter nisus*	T28P
Starling^	*Sturnus vulgaris*	T28P
Swallow^	*Hirundo rustica*	T28P
Treecreeper	*Certhia familiaris*	T28P
Willow Warbler^	*Phylloscopus trochilus*	T28P
Woodpigeon	*Columba palumbus*	T28P
Woodcock*+	*Scolopax rusticola*	T28P
Wren	*Troglodytes troglodytes*	T28P
Yellowhammer*	*Emberiza citrinella*	T28P & T28T

Key: * Red-listed ^ Amber-listed + Annex I (EU Bird's Directive)
(Recorded historically by NBDC database)

5.169 Winter season transects at the site (2023/2024). A total of 43 species were recorded during the walkover transects (Table 5.15). This represents a relatively diverse bird community with a range of farmland, woodland and wetland species represented. The species that were recorded in the largest numbers were common species such as Blackbird, *Turdus merula*, Woodpigeon, *Columba palumbus* and Chaffinch, *Fringilla coelebs*. The transect that recorded the most species diversity was Transect 2 (33 species) located in the west-southwest of the site.

5.170 Seven of the species recorded during the winter transects were red-listed: Golden Plover, *Pluvialis apricaria*, Kestrel, Meadow Pipit, *Anthus pratensis*, Red Kite, Snipe, *Gallinago gallinago*, Redwing, *Turdus iliacus* and Yellowhammer. A further five of the species recorded were amber-listed: Black-headed Gull, *Chroicocephalus ridibundus*, Goldcrest, *Regulus regulus*, Mallard, *Anas platyrhynchos*, Starling, *Sturnus vulgaris* and Teal, *Anas crecca*.

5.171 A flock of Golden Plover (c. 40 individuals) were recorded in flight off-site to the east-northeast during the December 2023 walkover survey. They were several hundred metres off-site and were not recorded during any further survey visits. Golden Plover is red-listed due to significant long-term declines in its breeding population in Ireland. The wintering population primarily originates from Iceland and northern Europe (Scandinavia and parts of Russia). These birds migrate to Ireland and other parts of western Europe to escape the harsh winter conditions in their breeding grounds.

5.172 Meadow Pipits were recorded on Transect 2 and Transect 3 associated with areas of unimproved grassland. This species is common locally and nationally and is included on the Red-list due to declines in breeding population likely to have been associated with the two severe winters in 2009/2010 and 2010/2011. There are indications that the population of Meadow Pipits has substantially recovered over the past decade from the trends emerging in BirdWatch Ireland's Countryside Bird Survey. (https://c0cre470.caspio.com/dp/4bae3000b62efcaae08e4f4da8bd).

5.173 Snipe are red-listed due to severe declines in both breeding and wintering populations over recent decades. Intensification of agriculture including land draining has been implicated in observed declines (Gilbert *et al*. 2021).

5.174 Redwing is a winter migrant thrush species with a declining wintering population recorded in recent years. These declines are likely linked to changes in their breeding and wintering grounds, as well as broader environmental changes across their migration routes.

5.175 Along with Golden Plover and Red Kite, two other Annex I bird species were recorded with Peregrine Falcon noted on Transect 1 at the east of the site and a single Little Egret observed at distance in the quarry basin.

5.176 Outside of the survey transects there was an additional 15 bird species recorded during the site visits in December 2023 and early March 2024. This included records of Collared Dove, *Streptopelia decaocto*, Cormorant, *Phalocrocorax carbo*, Crossbill, *Loxia curvirostra*, Great Crested Grebe, *Podiceps cristatus*, Grey Wagtail, *Motacilla cinerea*, Herring Gull, *Larus argentatus*, House Sparrow, *Passer domesticus*, Lesser Redpoll, *Acanthis cabaret*, Linnet, *Linaria cannabina*, Long-tailed Tit, *Aegithalos caudatus*, Mistle Thrush, *Turdus viscivorus*, Mute Swan, *Cygnus olor*, Reed Bunting, *Emberiza schoeniclus*, Treecreeper, *Certhia familiaris* and Woodcock, *Scolopax rusticola*.

5.177 Two of these additional casually recorded species are also red-listed: Grey Wagtail and Woodcock. There was a single observation of an individual Grey Wagtail from beside the Ballinclare River on January 26th. Woodcock was recorded on a site track at the southwest of the site at dusk on the same date. Grey Wagtail is a species that typically lives alongside streams and rivers. Both species have had significant population declines in recent decades. The decline in Grey Wagtail population has been linked to a deterioration in water quality in our rivers (Gilbert et al. 2021). However, in Ireland it is the breeding population of Woodcock that has shown the significant decline. In winter, large numbers of Woodcock arrive from northern and eastern Europe and the species is overall considered of Least Concern on the IUCN list.

Table 5-15
Winter Season Transect Results

Common Name	Scientific Name	T1	T2	T3
Blackbird	*Turdus merula*	2	3	4
Black-headed Gull^	*Chroicocephalus ridibundus*	P		
Blue Tit	*Cyanistes caeruleus*	1	1	2
Bullfinch	*Pyrrhula pyrrhula*		1	1
Buzzard	*Buteo buteo*	1		1
Chaffinch	*Fringilla coelebs*	1	4	3
Coal Tit	*Periparus ater*		1	2
Dunnock	*Prunella modularis*		1	1
Feral Pigeon	*Columba livia domestica*	3		
Fieldfare	*Turdus pilaris*		2	
Goldcrest^	*Regulus regulus*	1	2	1
Golden Plover*	*Pluvialis apricaria*	P		
Goldfinch	*Carduelis carduelis*	2		
Great Tit	*Parus major*	1	1	
Great-spotted Woodpecker	*Dendrocopos major*		P	
Grey Heron	*Ardea cinerea*	1		1
Hooded Crow	*Corvus cornix*	2	1	2
Jackdaw	*Corvus monedula*	3	2	
Jay	*Garrulus glandarius*		1	
Kestrel*	*Falco tinnunculus*	P	1	
Little Egret	*Egretta garzetta*	P		
Little Grebe	*Tachybaptus ruficollis*	P		
Magpie	*Pica pica*	1	1	1
Mallard^	*Anas platyrhynchos*	P		2
Meadow Pipit*	*Anthus pratensis*		3	1
Moorhen	*Gallinula chloropus*			1
Peregrine Falcon	*Falco peregrinus*	1		
Pheasant	*Phasianus colchicus*	P	P	P
Pied Wagtail	*Motacilla alba*	1		1
Raven	*Corvus corax*	1	2	
Red Kite*	*Milvus milvus*		1	1
Redwing*	*Turdus iliacus*		4	3
Robin	*Erithacus rubecula*	1	3	3
Rook	*Corvus frugilegus*	7	P	2
Siskin	*Spinus spinus*			1
Snipe*	*Gallinago gallinago*		1	2

Common Name	Scientific Name	T1	T2	T3
Song Thrush	*Turdus philomelos*	P	1	1
Starling^	*Sturnus vulgaris*	2	3	
Stonechat	*Saxicola rubicola*			1
Teal^	*Anas crecca*			1
Woodpigeon	*Columba palumbus*	5	3	3
Wren	*Troglodytes troglodytes*	2	2	2
Yellowhammer*	*Emberiza citrinella*		1	1

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

Peak counts of each species on transect (<100m from the transect line) are shown and where a species was only recorded beyond that distance it is shown as 'P' for present.

5.178 The breeding season bird transect survey confirmed a relatively diverse bird community present, with a total of 53 species recorded (Table 5.16). Many of these species are resident year-round and are supplemented with summer migrants such as Swallow, *Hirundo rustica* and Willow Warbler, *Phylloscopus trochilus*.

5.179 The majority of the species recorded are common locally and nationally. Numbers of birds recorded on the survey transects were generally low although there was a good diversity of birds present, reflecting the range of habitats across the site.

5.180 Seven of the species noted are red-listed: Grey Wagtail, Kestrel, Meadow Pipit, Red Kite, Snipe, *Gallinago gallinago*, Swift, *Apus apus* and Yellowhammer. Of these the only species confirmed to breed on site were Meadow Pipit and Yellowhammer. Both of these species were associated with the scrub and rough grassland at the west of the site. Kestrel did not breed at the site in 2024.

5.181 A single Snipe was flushed from the wet grassland at the west of the site in May 2024. It is a nocturnally active wading species that is cryptically coloured and roosts on the ground during the daytime. They are currently red-listed due to observed declines in breeding and wintering populations in Ireland in recent decades. Intensification of agriculture and land drainage are cited as likely reasons for the declines (Gilbert *et al*. 2021).

5.182 A single Swift was observed flycatching above the edge of the quarry basin in June 2024. This summer migrant has had a significant decline in breeding population in recent decades. Lack of suitable nesting sites in modern buildings combined with a reduction in insect prey is believed to have contributed to the observed declines.

5.183 Kestrel did not breed on site in 2024 but were observed hunting on site on occasion. Similarly, other raptor species, Buzzard, *Buteo buteo* and Red Kite were frequently observed over the site but did not breed within the application site.

5.184 Ten additional bird species were recorded as casual records outside of the transect walkovers on site. These included Sparrowhawk, *Accipiter nisus*, Cormorant, House Sparrow, Jay, *Garrulus glandarius*, Long-tailed Tit, *Aegithalos caudatus*, Mistle Thrush, *Turdus viscivorus*, Mute Swan, *Cygnus olor*, Racing Pigeon, *Columba livia domestica*, Sedge Warbler, *Acrocephalus schoenobaenus* and Stock Dove, *Oenas oenas*.

5.185 Few individual birds or waterbird species were associated with the quarry basin or the settlement ponds. Moorhen, *Gallinula chloropus*, Mallard and Grey Heron were regularly recorded on the settlement ponds in low numbers. Little Grebe, *Tachybaptus ruficollis* was regularly present on the quarry basin. However, it was

not unusual for the bird activity in this area to be dominated by the presence by a pair of Peregrine Falcon.

5.186 A small number of Sand Martin, *Riparia riparia*, burrows (c. 6 burrows) were active in soft spoil at the southeast of the quarry basin.

5.187 These birds nested on the cliff face and were monitored throughout incubation and brooding. Two chicks were hatched and these were ringed by NPWS in June 2024 (Plate 5.20). The chicks fledged successfully in mid-June and young birds were observed at the site into late July.

Plate 5-20
Peregrine Falcon Chicks Ringed at Ballinclare Site, June 2024

Table 5-16
Breeding Season Transect Results

Common Name	Scientific Name	T1	T2	T3
Blackbird	*Turdus merula*	1	2	2
Blackcap	*Sylvia atriacapilla*		1	
Blue Tit	*Cyanistes caeruleus*	2		1
Bullfinch	*Pyrrhula pyrrhula*			2
Buzzard	*Buteo buteo*	1		P
Chaffinch	*Fringilla coelebs*	2	4	3
Chiffchaff	*Phylloscopus collybita*	P	1	1
Coal Tit	*Periparus ater*			1
Collared Dove	*Streptopelia decaocto*	2		
Cuckoo	*Cuculus canorus*		P	
Dunnock	*Prunella modularis*		1	1
Goldcrest^	*Regulus regulus*	1		1

Common Name	Scientific Name	T1	T2	T3
Goldfinch	*Carduelis carduelis*	4	2	
Great Crested Grebe^	*Podiceps cristatus*	P		
Great Tit	*Parus major*		1	
Great-spotted Woodpecker	*Dendrocopos major*			P
Grey Heron	*Ardea cinerea*	P		1
Grey Wagtail*	*Motacilla cinerea*	1		
Herring Gull^	*Larus argentatus*	P		
Hooded Crow	*Corvus cornix*	2		1
Jackdaw	*Corvus monedula*	3	2	
Kestrel*	*Falco tinnunculus*		1	
Lesser Black-backed Gull^	*Larus fuscus*	2		
Lesser Redpoll	*Acanthis cabaret*			2
Linnet^	*Linaria cannabina*		4	
Little Egret	*Egretta garzetta*	P		
Little Grebe	*Tachybaptus ruficollis*	P		
Magpie	*Pica pica*	1	1	1
Mallard^	*Anas platyrhynchos*		3	
Meadow Pipit*	*Anthus pratensis*		2	
Moorhen	*Gallinula chloropus*			1
Peregrine Falcon	*Falco peregrinus*	1	P	
Pheasant	*Phasianus colchicus*		P	P
Pied Wagtail	*Motacilla alba*	1		1
Raven	*Corvus corax*	1		
Red Kite*	*Milvus milvus*		1	3
Reed Bunting	*Emberiza schoeniclus*			1
Robin	*Erithacus rubecula*	3	2	2
Rook	*Corvus frugilegus*	4	3	2
Sand Martin^	*Riparia riparia*	6		
Sandwich Tern^	*Sterna sandvicensis*	P		
Skylark^	*Alauda arvensis*		1	1
Snipe*	*Gallinago gallinago*		1	
Song Thrush	*Turdus philomelos*	P	1	P
Starling^	*Sturnus vulgaris*			7
Stonechat	*Saxicola rubicola*		2	
Swallow^	*Hirundo rustica*	4	4	12
Swift*	*Apus apus*	1		
Whitethroat	*Sylvia communis*		1	
Willow Warbler^	*Phylloscopus trochilus*	3	5	3

Common Name	Scientific Name	T1	T2	T3
Woodpigeon	*Columba palumbus*	4	5	6
Wren	*Troglodytes troglodytes*	2	3	2
Yellowhammer*	*Emberiza citrinella*		1	1

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

Peak counts of each species on transect (<100m from the transect line) are shown and where a species was only recorded beyond that distance it is shown as 'P' for present.

5.188 The trail camera analysis (Table 5.10) also identified the bird species detected at the camera deployment locations. A total of 24 species were recorded, all of which were recorded at the site as part of the transect and casual survey observations. No nocturnally active birds were recorded (Owls, Woodcock) on the trail cameras. Buzzard was the only bird of prey on the trail camera record (Plate 5.21).

Plate 5-21
Buzzard in Flight, West of Settlement Ponds

5.189 Breeding season Point Counts were carried out to record the breeding bird community present along the L1157. In all, 29 bird species were recorded at the three count locations (Table 5.17). One species not observed at the site, Greenfinch, *Chloris chloris*, was recorded. The species represent a fairly typical farmland/woodland bird community. Two Red-listed species were observed, Red Kite and Redwing. A Red-Kite was observed in the distance at PC3 in May 2024. Three Redwing were recorded in flight from PC1 in March 2024.

5.190 The site and surrounding area supports a relatively diverse wintering and breeding bird community. The presence of an active Peregrine Falcon nesting site increases the overall value of the site for birds to county importance.

Table 5-17
Bird Species Recorded at Point Count Locations Along L1157

Common Name	Scientific Name	PC1	PC2	PC3
Blackbird	*Turdus merula*	2	2	2
Blue Tit	*Cyanistes caeruleus*		1	
Buzzard	*Buteo buteo*	P		
Chaffinch	*Fringilla coelebs*	1	2	1
Chiffchaff	*Phylloscopus collybita*	P	1	1
Coal Tit	*Periparus ater*		1	
Dunnock	*Prunella modularis*			1
Goldcrest^	*Regulus regulus*			
Goldfinch	*Carduelis carduelis*			3
Great Tit	*Parus major*			1
Greenfinch^	*Chloris chloris*		1	
Hooded Crow	*Corvus cornix*		2	
Jackdaw	*Corvus monedula*	1		
Lesser Redpoll	*Acanthis cabaret*			2
Linnet^	*Linaria cannabina*			3
Magpie	*Pica pica*		2	1
Mistle Thrush	*Turdus viscivorus*			2
Pheasant	*Pahasianus colchicus*	P		
Red Kite*	*Milvus milvus*			P
Redwing*	*Turdus iliacus*	3		
Robin	*Erithacus rubecula*	2	1	2
Rook	*Corvus frugilegus*		6	2
Song Thrush	*Turdus philomelos*		P	
Starling^	*Sturnus vulgaris*	3		3
Swallow^	*Hirundo rustica*	1	3	7
Treecreeper	*Certhia familiaris*	1		
Willow Warbler^	*Phylloscopus trochilus*	2	1	2
Woodpigeon	*Columba palumbus*	4	2	
Wren	*Troglodytes troglodytes*	1	1	2

* Red-listed ^ Amber-listed (Gilbert et al. 2021).
Species recorded during the 2024 breeding season.
Peak counts recorded are shown with birds only recorded beyond 50m noted as 'P' for present.

Aquatic Ecology

5.191 The following section summarises each of the n=12 survey sites in terms of aquatic habitats, physical characteristics and overall value for fish, white-clawed crayfish, otter and macrophyte/aquatic bryophyte communities. Environmental DNA results (collected by Ecology Ireland Ltd.) are provided in Appendix 5-A. Biological water quality (Q-sample) and macro-invertebrate sweep sampling results are also summarised for each site with full results in Appendix 5-F. A summary of the fish species recorded at each survey site is provided in Table 5.18 and 5.19. A summary of the aquatic species and habitats of high conservation concern recorded during the surveys is provided in Tables 5.20 and 5.21. Habitat codes are according to Fossitt (2000). Scientific names are provided at first mention only. Sites were surveyed in July 2024.

5.192 **Site A1 (Potters River, Ballinclare):** was located on the Potters River (EPA code: 10P01) upstream of Ballinclare Quarry (i.e. an upstream control site). The upland eroding channel (FW1) had been historically deepened but showed good instream recovery. The river flowed over a moderate gradient in a U-shaped channel with a sinuous profile and was 4-5m wide and 0.1-0.3m deep. The profile was of slow flowing shallow riffle and glide with localised pool in bank undercuts and on meanders. The substrata were dominated by abundant boulder and cobble with mixed gravels and sand. Siltation was moderate overall with silt plumes underfoot but the majority of the substrata were unbedded. Macrophyte growth was not present due to high shading but larger substrata supported occasional *Fontinalis antipyretica* moss and abundant the *Chiloscyphus polyanthos* liverwort. The riparian areas featured mixed broad-leaved woodland (WD1) with mature ash, hazel, holly, beech and blackthorn with bramble and ivy in the understories. The site was bordered by improved grassland (GA1). Brown trout (*Salmo trutta*) (*n*=39) was the only fish species recorded via electro-fishing at site A1 (Chart 5-1). The river at this location was a good quality salmonid nursery given broken water sequences and a rocky bed that provided abundant refugia for good numbers of juveniles. Mixed gravels in glide and pool tailings provided good quality spawning areas. Holding habitat was moderate given the paucity of deeper pool habitat due to historical deepening/modifications. The river was of too high an energy for lamprey and no depositional soft silt areas suitable for ammocoete burial were observed. While the site had good suitability for European eel, (i.e. rocky refugia, good shading & ample depth, none were recorded. Despite some physical suitability for white-clawed crayfish, none were recorded and the species is not known from the watercourse or wider catchment. No otter signs were recorded in vicinity of the site in spite of good foraging suitability. Biological water quality, based on Q-sampling, was calculated as Q3-4 (moderate status) (Appendix 5-F). No macro-invertebrate species of conservation value greater than ‘least concern’, according to national red lists, were recorded via Q-sampling.

Chart 5-1
Length Frequency Distribution Recorded : Site A1, Potters River

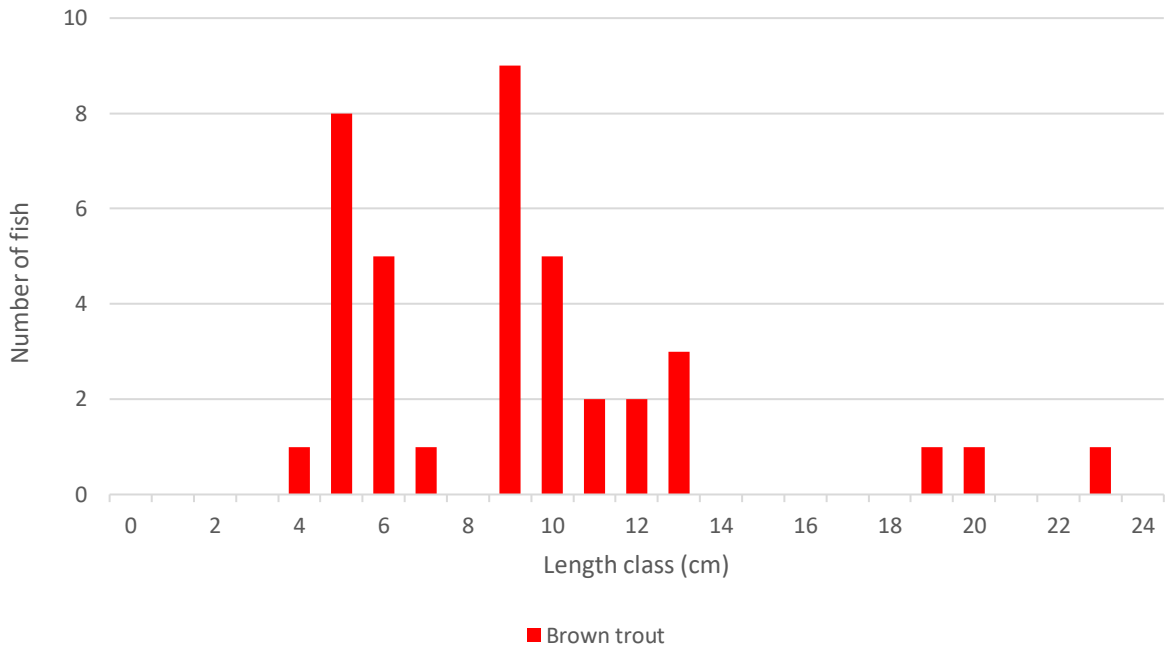


Plate 5-22
Brown Trout at Site A1, Potters River, July 2024
(upstream of Ballinclare Quarry)

Plate 5-23
Representative Image of Site A1, Potters River Upstream of Quarry

5.193 **Site A2 (Potters River, Ballinameesda Lower):** Site A2 was located on the Potters River (10P01) in the vicinity of the M11 road crossing, approximately 1.2km downstream of site A1. The sinuous upland eroding channel (FW1) flowed over a moderate gradient and was 4-5m wide and 0.1-0.6m deep with 1-1.5m high banks. The profile comprised a mix of riffle, glide and pool. The substrata were dominated by abundant boulder and cobble with mixed gravels and sand. Siltation was moderate overall with silt plumes underfoot but the majority of the substrata were unbedded. Macrophyte growth was not present due to high shading but larger substrata supported occasional *Chiloscyphus polyanthos* and *Rhynchostegium riparioides*. The river was lined by mature treelines of ash and alder with bramble-dominated understories. The site was bordered by improved grassland (GA1). Brown trout (*n*=28) and European eel (*Anguilla anguilla*) (*n*=4) were the only fish species recorded via electro-fishing at site A2 (Chart 5-2). The site was a good quality salmonid nursery, with abundant instream refugia and flow diversities supporting good numbers of juveniles. Good quality spawning habitat was present in mixed gravels in glide and pool areas. The quality of holding habitat was also good given the presence of pool behind large woody debris dams and in bank undercuts. The high energy site was unsuitable for lamprey with no depositional soft silt areas for ammocoetes present. The site had good suitability for European eel (i.e. rocky refugia, good shading & ample depth) and a medium density population was recorded. Despite some physical suitability for white-clawed crayfish, none were recorded and the species is not known from the watercourse or wider catchment. No otter signs were recorded in vicinity of the site. Biological water quality, based on Q-sampling, was calculated as Q4 (good status) (Appendix 5-F). No macro-invertebrate species of conservation value greater than ‘least concern’, according to national red lists, were recorded via Q-sampling.

Chart 5-2
Length Frequency Distribution : Site A2 on Potters River

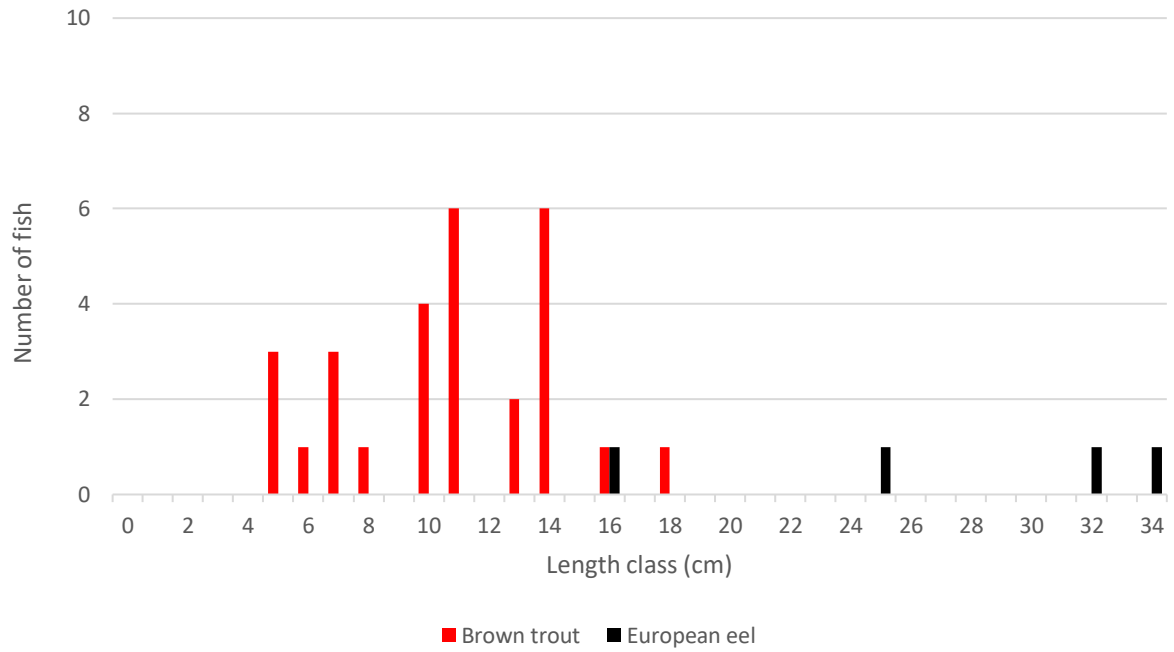


Plate 5-24
European Eel Recorded at Site A2 on Potters River, July 2024

Plate 5-25
Representative Image of Site A2 on Potters River Downstream of Quarry

5.194 **Site B1 (Ballinclare Stream, Carrigmore):** Site B1 was located on the uppermost reaches of the Ballinclare Stream (unmapped by the EPA) along the southern site boundary. The lowland depositing stream (FW2) had been historically realigned along the local road and quarry site boundary, resulting in a U-shaped channel that was 1m wide with 0.5-1m high banks. The stream suffered from low summer water levels at the time of survey, with near imperceptible flows and a depth of 0.05m. The stream was likely ephemeral at this location. The heavily modified bed was composed of silt/mud, exposed clay and abundant leaf litter. The site did not support macrophytes or aquatic bryophytes due to high shading shade and ephemeral flows. The stream flowed through mature plantation woodland (WS2) with scattered mature oak, ash and beech and scrubby understories. No fish were recorded via electro-fishing at site B1. The modified channel was not of fisheries value or high aquatic value given poor flows and evident seasonality. It was also too shallow to be of value to amphibians given the absence of ponding water and macrophyte vegetation. For the same reasons it was not of value to white-clawed crayfish and the species was not recorded (not known from the watercourse or wider catchment). No otter signs were recorded in vicinity of the site. Biological water quality, based on Q-sampling, was calculated as Q4 (good status) (Appendix 5-F). However, it should be noted that this was a tentative rating given poor flows and an absence of suitable riffle areas for sampling (Toner *et al*., 2005). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Plate 5-26
Representative Image of Site B1 on Ballinclare Stream

5.195 **Site B2 (Ballinclare Stream, Ballinclare):** Site B2 was located on the Ballinclare Stream (unmapped by the EPA) along the southern site boundary, approximately 450m downstream of site B1. As per upstream, the lowland depositing stream (FW2) had been extensively realigned and modified historically and flowed parallel to the local road. The U-shaped channel was 1-1.5m wide and typically 0.05m deep with no visible flows and intermittent pools of water. The bed was composed of anoxic silt and abundant leaf litter. The heavily shaded channel supported occasional common clubrush (*Schoenoplectus lacustris*) and hemlock water dropwort (*Oenanthe crocata*) with frequent floating common duckweed (*Lemna minor*). The riparian areas supported mature oak and beech with scattered grey willow (*Salix cinerea* sp. *oleifolia*). The understories supported golden-scale male fern (*Dryopteris affinis*), Enchanter's-nightshade (*Circaea lutetiana*), remote sedge (*Carex remota*), wild angelica, bramble, ivy, hogweed, and honeysuckle (*Lonicera periclymenum*). No fish were recorded via electro-fishing at site B2. The modified channel was not of fisheries value given poor flows and evident seasonality. However, the channel had some low suitability for smooth newt given the presence of ponding water with a low cover of macrophytes. A low density of newt efts (juveniles, *n*=2) was recorded via sweep netting. The site was unsuitable for white-clawed crayfish and the species was not recorded (not known from the watercourse or wider catchment). No otter signs were recorded in vicinity of the site. Biological water quality, based on Q-sampling, was calculated as Q2-3 (poor status) (Appendix 5-F). However, it should be noted that this was a tentative rating given poor flows and an absence of suitable riffle areas for sampling (Toner et al., 2005). No macro-invertebrate species of conservation value greater than ‘least concern’, according to national red lists, were recorded via Q-sampling.

Plate 5-27
Smooth Newt Eft Recorded at Site B2 on Ballinclare Stream, July 2024

Plate 5-28
Representative Image Site B2 on Ballinclare Stream

5.196 **Site C1 (Ballinameesda Lower Stream, Kilmacurra East):** Site C1 was located on the Ballinameesda Lower Stream (10B74) approximately 75m upstream of the Ballinclare Stream confluence (i.e. an upstream control site). The lowland depositing stream (FW2) had been historically straightened and deepened, resulting in a U-shaped channel with 1-2m high banks. The stream was 2m wide and 0.1-0.2m deep with a profile of slow-flowing shallow riffle and glide and only very localised shallow pool. The substrata comprised occasional small boulder with heavily bedded mixed gravels and silt. Siltation was very high with much of the gravels covered in silt with very heavy infiltration (soft underfoot with large silt plumes). Macrophytes were absent from the site due to high shading, high siltation and high turbidity. The muddy banks supported occasional *Conocephalum salebrosum* and *Pellia epiphylla* liverwort species. The riparian zones featured scattered mature beech, downy birch, holly, cherry laurel and wych elm. The site

was bordered by semi-improved grassland (GA1) with heavy cattle poaching observed that evidently exacerbated siltation pressures. Brown trout (*n*=8) and lamprey (*Lampetra* sp.) (*n*=25) were the only fish species recorded via electro-fishing at site C1 (Chart 5-3). Whilst juveniles were present at low densities, the site was considered a poor-quality salmonid nursery due to poor flows and gross siltation. Although some moderate quality spawning habitat existed locally in hard areas of bed it was compromised by siltation pressures. The quality of holding habitat was poor given the paucity of pool habitat. However, the heavily silted site was a good quality nursery habitat for lamprey ammocoetes with a high density recorded (up to 15 per m^2). The soft organic-rich silt and sand provided optimal burial habitat with ample food resources. As with salmonids, the spawning capacity of the site was significantly reduced because of gross siltation. The site had some low value as an eel nursery (i.e. silt burial areas and localised shallow pools) but downstream barriers including observed debris dams at old cattle crossing barricades would limit upstream passage for the species. No eels were recorded present. Suitability for white-clawed crayfish was poor and none were recorded (species is not known from the watercourse or wider catchment). No otter signs were recorded in vicinity of the site.Biological water quality, based on Q-sampling, was calculated as Q3 (poor status) (Appendix 5-F). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Chart 5-3
Length Frequency Distribution : Site C1 on Ballinameesda Lower Stream

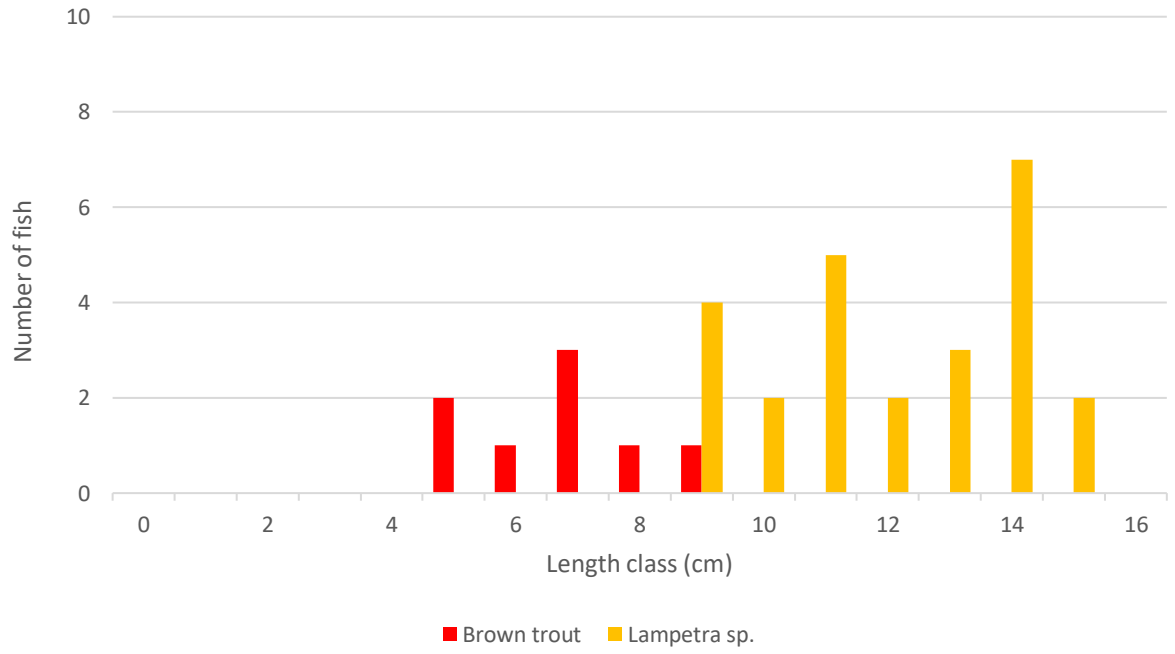


Plate 5-29
Mixed Cohort *Lampetra* sp. Ammocoetes, Site B2 Ballinameesda Lower Stream

Plate 5-30
Representative Image of Site B2 on Ballinameesda Lower Stream
(illustrating organic rich soft sediment)

5.197 **Site C2 (Ballinameesda Lower Stream, Ballinclare):** Site C2 was located on the Ballinameesda Lower Stream (10B74) approximately 75m downstream of the Ballinclare Stream confluence. As per upstream, the lowland depositing stream (FW2) had been historically straightened and deepened, resulting in a U-shaped channel with 2-2.5m high banks. The stream was 2m wide and 0.1-0.15m deep with a profile of slow-flowing shallow riffle and glide and only very localised shallow pool. The substrata comprised occasional bedrock and angular small boulder with heavily bedded mixed gravels and silt. Siltation was very high with much of the gravels covered in silt with very heavy infiltration (large silt plumes) but deposits were shallower in depth compared with upstream (i.e. more superficial silt). Although macrophytes were absent from the site due to high shading, high siltation and high turbidity, the site did support occasional *Rhynchostegium riparioides* moss. The banks supported trailing *Thamnobryum alopercum* with occasional *Conocephalum salebrosum* on the lower splash zone. The riparian areas supported mature beech, holly and cherry laurel with ivy in the understories. The site was bordered by semi-improved grassland (GA1) with narrow borders. Brown trout (*n*=24), lamprey (*Lampetra* sp.) (*n*=15) and European eel (*n*=1) were recorded via electro-fishing at site C2 (Chart 5-4). Whilst juveniles were present in low densities, the site was considered a poor-quality salmonid nursery due to poor flows and gross siltation. Although some moderate quality spawning habitat existed locally in hard areas of bed it was compromised by high rates of siltation and colmation. The quality of holding habitat was poor given the paucity of pool habitat. The soft organic rich-silt albeit more compacted and superficial in nature than upstream, provided a moderate quality nursery habitat for lamprey ammocoetes with a medium density recorded (up to 8 per m^2). As with salmonids, the spawning capacity of the site was significantly reduced due to siltation. The site had some low value as an eel nursery (i.e. silt burial areas and localised shallow pools) with a single adult recorded. Poor flows and a paucity of deeper pool reduced the overall suitability for the species. Suitability for white-clawed crayfish was poor and none were recorded (species is not known from the watercourse or wider catchment). No otter signs were recorded in vicinity of the site. Biological water quality, based on Q-sampling, was calculated as Q3 (poor status) (Appendix 5-F). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Chart 5-4
Length Frequency Distribution : Site C2 on Ballinameesda Lower Stream

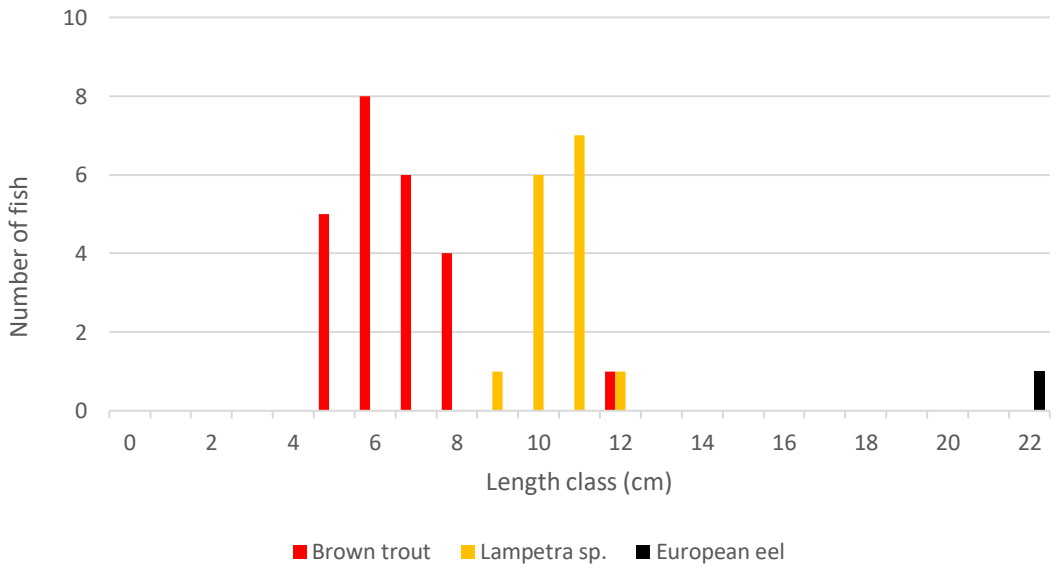


Plate 5-31
Juvenile Brown Trout at Site C2 on Ballinameesda Lower Stream, July 2024

Plate 5-32
Representative Image of Site C2 on Ballinameesda Lower Stream

5.198 **Site L1 (Ballinclare Quarry void):** Site L1 was **located** at the void of Ballinclare Quarry. Since extraction and production activities were suspended in 2016, the floor of the quarry had been flooded with surface water run-off and limited groundwater ingress (SLR, 2021). The void covered a surface area of c.7ha although it was being actively drawn down at the time of the survey. The void was predominately

shallow in the northwestern part of the basin with exposed silt, clay and mixtures of coarse aggregates. The shallow pools of water between 0.2-1m deep supported patches of fragile stonewort (*Chara globularis*). The southeastern side of the void was much deeper, typically >5m with very steep margins and only supported localised *Chara globularis* in the margins. The quarry was a transitional habitat in constant flux with rising and falling water levels. For these reasons unlike disused mature quarry sites, the study area had very limited macrophyte plant growth. Site L1 was not of fisheries value given its recent history and isolation from other aquatic habitats and fish migration pathways. The clear, open shallow water areas did not support fish with no significant supporting habitat or visual observations during the survey. No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via sweep sampling. Marginal areas with *Chara* vegetation supported abundant grazing snails including great pond snail (*Lymnaea stagnalis*), New Zealand mud snail (*Potamopyrgus antipodarum*) and wandering snail (*Radix balthica*).

Plate 5-33
Representative Image of Quarry Void at Ballinclare Quarry

5.199 **Site P1 (Pond, Ballinclare Quarry):** Site P1 was the first in a series of (connected) quarry settlement ponds in the western part of the site. The rectangular pond was 0.05ha in size and 1-2.5m deep with clear water. The pond had steep marginal slopes grading into a deep central basin with a bed of soft silt. The pond supported a very high coverage of broad-leaved pondweed (*Potamogeton natans*) with occasional spiked-water milfoil (*Myriophyllum spicatum*). The littorals also supported abundant toad rush (*Juncus bufonius*), hard rush (*Juncus inflexus*), water horsetail (*Equisetum fluviatile*) and water mint (*Mentha aquatica*). The pond was fringed by dense growth of grey willow, gorse and bramble. Site P1 was not of significant fisheries value with no fish populations observed during the survey. No European eel or white-clawed crayfish eDNA were detected (Table 5.18). However, the pond supported smooth newt with a low density of efts (juveniles) recorded via sweep sampling. No otter signs were recorded in vicinity of the site. No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via sweep sampling. The community was dominated by Coenagrionidae damselflies and wandering snail (*Ampullacaena balthica*) (Appendix 5-F).

Plate 5-34
Representative Image of Pond Site P1
(showing strong inflow).

5.200 **Site P2 (Pond, Ballinclare Quarry):** Site P2 was located at in the second stage of a series of settlement ponds in the western part of the site, adjacent to site P1. The rectangular pond was 0.06ha in size and 1-2.5m deep with clear water. The pond had steep marginal slopes grading into a deep central basin with a bed of soft silt. The pond supported a very high coverage of broad-leaved pondweed with occasional spiked-water milfoil. The littorals also supported occasional branched-bur-reed (*Sparganium erectum*), water-horsetail, lesser spearwort (*Ranunculus flammula*) and water mint. The pond was fringed by dense growth of grey willow, downy birch, gorse, bramble and rushes. Site P2 was not of significant fisheries value with no fish populations observed during the survey. No European eel or white-clawed crayfish eDNA were detected (Table 5.18). However, the pond supported smooth newt with a low density of efts (juveniles) recorded via sweep sampling. No otter signs were recorded in vicinity of the site. No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via sweep sampling. The community was dominated by Coenagrionidae damselflies (Appendix 5-F).

Plate 5-35
Representative Image of Pond Site P2

5.201 **Site P3 (Pond, Ballinclare Quarry):** Site P3 was third in the series of settlement ponds in the western part of the site, adjacent to sites P4 and P5. The rectangular pond was 0.07ha in size and 2-2.5m deep with clear water. This was the largest settlement pond on site. The pond had very steep marginal slopes grading into a deep central basin with a bed of soft silt and abundant decaying floc in suspension. As with other nearby ponds, the site supported a very high coverage of broad-leaved pondweed. The pond also supported occasional bulrush, lesser spearwort, water mint, spiked water-milfoil, small pondweed and blue water speedwell (*Veronica anagallis-aquatica*). The pond was fringed by very dense scrub dominated by gorse with occasional downy birch and grey willow. Site P3 was not of significant fisheries value with no fish populations observed during the survey. However, European eel were detected via eDNA sampling (Table 5.18). However, the pond supported smooth newt with a low density of efts (juveniles) recorded via sweep sampling. No otter signs were recorded in vicinity of the site. No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via sweep sampling. The community was dominated by Coenagrionidae damselflies (Appendix 5.F).

Plate 5-36
Representative Image of Pond Site P3

5.202 **Site P4 (Pond, Ballinclare Quarry):** Site P4 was the fourth in the series of settlement ponds in the western part of the site, between ponds P3 and P5. The small elliptical pond was 0.03ha in size and 2-2.5m deep with clear water. The pond had very steep marginal slopes grading into a deep central basin with a bed of soft silt and abundant decaying floc in suspension. The pond supported a very high coverage of broad-leaved pondweed with rare bulrush and small pondweed. Lesser spearwort was occasional in the margins. The pond was fringed by very dense scrub dominated by gorse and bramble with occasional grey willow. Site P4 was not of significant fisheries value with no fish populations observed during the survey. However, European eel were detected via eDNA sampling (Table 5.18). However, the pond supported smooth newt with a low density of efts (juveniles) recorded via sweep sampling. No otter signs were recorded in vicinity of the site. No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via sweep sampling. The community was dominated by Coenagrionidae damselflies and wandering snail (Appendix 5-F).

Plate 5-37
Representative Image of Pond Site P4

5.203 **Site P5 (Pond, Ballinclare Quarry):** Site P5 was the final settlement pond in the series of five ponds. The small elliptical pond was 0.025ha in size and 2-3m deep with clear water. The pond fed a heavily modified drainage tributary of the Potters River via an outfall. The pond had very steep marginal slopes grading into a deep central basin with a bed of soft silt and abundant decaying floc[2] in suspension. The pond supported a very high coverage of broad-leaved pondweed with branched bur-reed, bulrush (*Typha latifolia*), fennel pondweed (*Stuckenia pectinata*), small pondweed (*Potamogeton berchtoldii*) and spiked-watermilfoil all recorded as rare. Lesser spearwort and wild angelica were occasional in the margins. The pond was fringed by dense scrub dominated by gorse and bramble with occasional grey willow and buddleja (*Buddleja davidii*). Site P5 was not of significant fisheries value with no fish populations observed during the survey. No European eel or white-clawed crayfish eDNA was detected (Table 5.18). However, the pond supported smooth newt with a low density of efts (juveniles) recorded via sweep sampling. No otter signs were recorded in vicinity of the site. No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via sweep sampling. The community was dominated by Coenagrionidae damselflies (Appendix 5-F.

[2] floc is defined as an aggregation of (mostly dead) organic material, mainly from algae and diatoms, but also with potential origins from decaying macrophytes and associated decomposers (bacteria and fungi) (Moorkens & Killeen, 2020)

Plate 5-38
Representative Image of Pond Site P5

5.204 **White-clawed crayfish survey:** Despite some physical suitability (outside of alkalinity requirements), no white-clawed crayfish were recorded via hand searching/sweep netting (*n*=12 sites) during the July 2024 survey period. Furthermore, no white-clawed crayfish DNA was detected during eDNA sampling of 5 No. ponds in Ballinclare Quarry (Table 5.18). These results supported the absence of available records for the species within the survey area and wider catchment, reflecting unsuitable water chemistry and (siliceous) geologies (Demers *et al*., 2005; Lucey & McGarrigle, 1987).

5.205 **Environmental DNA (eDNA) analysis:** European eel were detected from both sites P4 and P5 (12 & 11 positive replicates out of 12, respectively; Table 5.18, Appendix 5-A). Positive results for smooth newt were also recorded from sites P4 and P5 in addition to P2 and P3. Whilst no smooth newt eDNA was detected at site P1, a low number of efts (juveniles) were recorded via sweep sampling. All pond samples tested negative for white-clawed crayfish and positive for common frog eDNA. Common Frog was also detected from the P1 & P2 in the quarry void.

Table 5-18
eDNA Results for Ballinclare Quarry Settlement Ponds, May 2024
(positive qPCR replicates out of 12 in parentheses).

Site	White-clawed crayfish	European eel	Smooth newt	Common frog
P1	Negative (0/12)	Negative (0/12)	Negative (0/12)	**Positive (1/12)**
P2	Negative (0/12)	Negative (0/12)	**Positive (3/12)**	**Positive (10/12)**
P3	Negative (0/12)	Negative (0/12)	**Positive (12/12)**	**Positive (11/12)**
P4	Negative (0/12)	**Positive (12/12)**	**Positive (12/12)**	**Positive (2/12)**
P5	Negative (0/12)	**Positive (11/12)**	**Positive (12/12)**	Negative (0/12)

5.206 **Biological Water Quality:** Sites A2 on the Potters River and B1 on the Ballinclare Stream achieved Q4 (good status) water quality and therefore met the target good status (≥Q4) requirements of the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 and the Water Framework Directive (2000/60/EC) (Figure 5-14). This status was based on the presence of the EPA group A (most pollution sensitive) mayfly and stonefly species such as *Rithrogena semicolorata* and *Nemurella picteti* in numbers ≥5% of the total sample abundance, respectively (Appendix 5-F). It should be noted that the Q-rating for site B1 is tentative only given the absence of suitable riffle areas for sampling in the ephemeral channel (as per Toner *et al*., 2005).

5.207 Site A1 on the Potters River upstream of Ballinclare Quarry, achieved Q3-4 (moderate status) water quality. Despite the presence of EPA group A species *Ecdyonurus insignis* and *Siphonoperla torrentium*, these were only recorded in low numbers (<5% of total sample) and thus did not meet the qualifying criteria for good status as set out by Toner *et al*. (2005).

5.208 Site B2 on the Ballinclare Stream and both sites C1 and C2 on the Ballinameesda Lower Stream achieved Q2-3 or Q3 (poor status) water quality based on an absence of group A species, low numbers or an absence of group B species and a dominance of group C or D species such as the mayfly *Baetis rhodani*, freshwater shrimp (*Gammarus duebeni*), New Zealand mud snail (*Potamopyrgus antipodarum*) and hoglouse (*Asellus aquaticus*) (Appendix 5-F). It should be noted that the Q-rating for site B2 is tentative only given the absence of suitable riffle areas for sampling in the heavily modified channel (as per Toner *et al*., 2005).

5.209 The moss bladder snail (*Aplexa hypnorum*), a species listed as ‘vulnerable’ in Ireland (Byrne *et al*., 2009) was recorded in low numbers from site B2 on the Ballinclare Stream (Appendix 5-F). No other rare or protected macro-invertebrate species (according to national red lists) were recorded in the biological water quality samples taken from a total of 7 No. riverine sites or 6 No. lacustrine sweep samples collected in July 2024 (Appendix 5-F). The nationally uncommon water stick insect (*Ranatra linearis*) was recorded in pond P3

.

Table 5-19
Fish Species Densities at Nearby Riverine Sites July 2024
(recorded via electro-fishing, bold indicates highest density recorded per species)

Site	Watercourse	CPUE (elapsed time)	Approx. Area Fished (m^2)	Fish density per m^2		
				Brown trout	*Lampetra* sp.	European eel
A1	Potters River	10	240	**0.163**	0.000	0.000
A2	Potters River	10	250	0.112	0.000	0.016
B1	Ballinclare Stream	5	20	0.000	0.000	0.000
B2	Ballinclare Stream	5	40	0.000	0.000	0.000
C1	Ballinameesda Lower Stream	10	200	0.040	**15 per m^2**	0.000
C2	Ballinameesda Lower Stream	10	180	0.133	8 per m^2	0.006

Table 5-20
Relative Abundance of Fish Species of Higher Conservation Value, July 2024
(recorded in the vicinity of the proposed development)

Site	Watercourse	Brown trout	*Lampetra* sp.	European eel	Other Species
A1	Potters River	High			
A2	Potters River	Medium		Medium	
B1	Ballinclare Stream	No fish recorded			
B2	Ballinclare Stream	No fish recorded			
C1	Ballinameesda Lower Stream	Low	High		
C2	Ballinameesda Lower Stream	Medium	Medium	Low	
L1	Quarry void	No fish recorded/observed			
P1	Pond	Fisheries appraisal only – no European eel detected via eDNA			
P2	Pond	Fisheries appraisal only – no European eel detected via eDNA			

Site	Watercourse	Brown trout	*Lampetra* sp.	European eel	Other Species
P3	Pond	Fisheries appraisal only – no European eel detected via eDNA			
P4	Pond	Fisheries appraisal only - European eel **detected** via eDNA			
P5	Pond	Fisheries appraisal only - European eel **detected** via eDNA			

Table 5-21
Summary of Aquatic Species and Habitats of Higher Conservation Value
(recorded in the vicinity of the proposed development, July 2024)

Site	Watercourse	White-clawed crayfish	Otter signs[2]	Annex I aquatic habitats	Rare or protected macrophytes/ aquatic bryophytes	Rare or protected macro-invertebrates	Other species/habitats of high conservation value
A1	Potters River	None recorded	None recorded	None recorded	None recorded	None recorded	
A2	Potters River	None recorded	None recorded	None recorded	None recorded	None recorded	**European eel**
B1	Ballinclare Stream	None recorded	None recorded	None recorded	None recorded	None recorded	
B2	Ballinclare Stream	None recorded	None recorded	None recorded	None recorded	None recorded	**Smooth newt (efts)**
C1	Ballinameesda Lower Stream	None recorded	None recorded	None recorded	None recorded	**Moss bladder snail, *Aplexa hypnorum* (Vulnerable, Byrne et al., 2009)**	***Lampetra* sp.**
C2	Ballinameesda Lower Stream	None recorded	None recorded	None recorded	None recorded	None recorded	***Lampetra* sp., European eel**
L1	Quarry void	None recorded	None recorded	None recorded	None recorded	None recorded	
P1	Pond	None recorded; negative eDNA	None recorded	None recorded	None recorded	None recorded	**Smooth newt (efts)**
P2	Pond	None recorded;	None recorded	None recorded	None recorded	None recorded	**Smooth newt (efts)**

Site	Watercourse	White-clawed crayfish	Otter signs[2]	Annex I aquatic habitats	Rare or protected macrophytes/ aquatic bryophytes	Rare or protected macro-invertebrates	Other species/habitats of high conservation value
		negative eDNA					
P3	Pond	None recorded; negative eDNA	None recorded	None recorded	None recorded	**Water stick insect (*Ranatra linearis*), nationally uncommon**	**European eel (eDNA); smooth newt (efts)**
P4	Pond	None recorded; negative eDNA	None recorded	None recorded	None recorded	None recorded	**European eel (eDNA); smooth newt (efts)**
P5	Pond	None recorded; negative eDNA	None recorded	None recorded	None recorded	None recorded	**Smooth newt (efts)**

Conservation value: White-clawed crayfish (*Austropotamobius pallipes*), brook lamprey (L*ampetra planeri*), river lamprey (*Lampetra fluviatilis*) and Eurasian otter (*Lutra lutra*) are listed under Annex II and Annex V of the Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) ('EU Habitats Directive'). White-clawed crayfish, otter and smooth newt (*Lissotriton vulgaris*) are protected under the Irish Wildlife Acts 1976-2023. White-clawed crayfish (Füreder et al., 2010) are listed as 'Endangered' according to the IUCN Red List. European eel are 'critically endangered' according to most recent ICUN red list (Pike et al., 2020) and listed as 'critically engendered' in Ireland (King et al., 2011).

[2] Otter signs within 150m of the survey site

Other Taxa

5.210 A desktop survey of other taxa recorded historically in the 2km Grid Squares that overlap the site and along the L1157 to the junction of the R772 was carried out. Table 5.22 below summarises the records of note in the NBDC database. Of note are local records of vulnerable and endangered butterfly species: Dark Green Fritillary, *Argynnis aglaja* (recorded 2021) and Wall, *Lasiommata megera* (recorded 2008). Neither species was observed during the field surveys at the Ballinclare site.

5.211 There is no suitable habitat and no local records of Marsh Fritillary, *Euphydryas aurinia* from the area.

Table 5-22
Other Taxa of Note Recorded in NBDC Database

Species Name	Conservation Status	Grid Square
Common Frog (*Rana temporaria*)	Annex V status, WA, lc	T28T
Smooth Newt (*Lissotriton vulgaris*)	WA, lc	T28P
Dark Green Fritillary (*Argynnis aglaja*)	Red Status (Vulnerable)	T28P
Wall (*Lasiommata megera*)	Red Status (Endangered)	T28P
Jenkins' Spire Snail (*Potamopyrgus antipodarum*)	Medium Impact Invasive Species	T28T

5.212 Casual records of other taxa noted the presence of Common Frog in the settlement ponds and areas with ponded water on site tracks. In addition, there were a number of observations of butterflies and other invertebrates which are summarised in Table 5.23.

5.213 The conservation value of the site for these other taxa is considered of local importance (higher value).

Table 5-23
Other Taxa Recorded as Casual Observations During Site Visits in 2024

Common Name	Scientific Name	Notes
Common Frog	*Rana temporaria*	Common Frog adults and spawn located near the ponds on site
Smooth Newt	*Lissotriton vulgaris*	Smooth Newt recorded in the eastern ponds
Common Blue Damselfly	*Enallagma cyathigerum*	Recorded near the ponds on site
Orange Tip	*Anthocharis cardamines*	Recorded widely on site
Small tortoiseshell	*Aglais urticae*	Recorded widely on site
Cinnabar Moth	*Tyria jacobaeae*	Recorded at edge of track on disturbed ground
Speckled Wood	*Pararge aegeria*	Recorded at woodland edge south of site
Common Blue	*Polyommatus icarus*	Recorded along overgrown track west of site

Common Name	Scientific Name	Notes
Green-veined White	*Pieris napi*	Recorded along overgrown track west of site
Meadow Brown	*Maniola jurtina*	Recorded widely at west of site
Ringlet	*Aphantopus hyperantus*	Recorded at edge of woodland

REVIEW OF ECOLOGY ISSUES - PREVIOUS APPLICATION

Previous Application (ABP 30881-21)

5.214 The submissions received by the Board and the Inspector's Report were reviewed to evaluate the primary concerns raised in relation to ecology and biodiversity. The previous application differs in many respects to the current proposed development for the site, but it remains a valuable exercise to consider the issues raised in relation to the previous application.

5.215 **Lack of dedicated Otter survey –** Queries were raised on the occurrence of Otters on the site and along the local watercourses. Concerns on the potential loss or degradation of habitat of importance for Otters were presented. Detailed desktop and field surveys on site, along the L1157 and on local watercourse were conducted as part of the ecological assessment for the current development. Observations from site staff are also included. The comprehensive evidence provided demonstrates (at most) occasional occurrence on-site by Otters. Otters are certainly present in areas downstream of the site. However, there is no indication that Otters are present in areas proximate to the site. In addition, much of the concern raised in relation to Otters as part of the previous application centred on the potential loss of habitat with the removal of the settlement ponds. Those ponds are being retained in the proposed development and will continue to afford Otters some occasional foraging opportunities.

5.216 **Lack of Peregrine Falcon survey and concern in relation to loss of nesting habitat -** There was a criticism of the lack of bird survey coverage, including dedicated surveys for Peregrine Falcon. As part of the response to these submissions it was confirmed that Peregrine Falcon did breed at the site. In 2024, regular watches of the Peregrine Falcon pair present were carried out and a nest location was identified. The ecology team liaised with NPWS to provide updates on the location and progress of the breeding attempt and were present when NPWS staff ringed the two chicks. These chicks successfully fledged. Discussions were had on appropriate measures to improve the nesting potential of the site and to promote nesting through the future development of the site. These measures are outlined in the mitigation section of this Chapter.

5.217 **Concerns about the adequacy of the bird surveys –** In addition to specific queries raised about breeding Peregrine Falcon at the site there was also concerns raised in relation to the adequacy of the general bird surveys, including an assessment of the birds occurring along the L1157. Detailed winter and breeding bird surveys were carried out at the site and are reported upon in this Chapter. Standard survey methodologies were adopted and the records were augmented by observations made during other ecological monitoring at and in the vicinity of the site.

5.218 **Bats, lack of bat surveys:** The lack of dedicated bat surveys in the previous assessment was criticised. It was also queried if the rock face of the quarry had

potential for roosting bats. Comprehensive bat surveys were conducted as part of the ecological surveys that inform the current assessment. In addition, details of roost records were sought from Bat Conservation Ireland. We would agree with the authors of the previous report that the rock faces of the quarry are unsuitable for roosting bats. They lack suitable potential roost features. Elsewhere on site the buildings and trees that are intended to be removed were also subject to assessment for their roost potential. Detailed bat survey results for the site and the L1157 corridor are presented in this Chapter.

5.219 **Rare plant survey:** It was raised in submissions from the public that historical records of rare and protected plants had not been discussed and the potential for their occurrence on the site not subject to adequate survey effort. Local historical records of Greater Broomrape, *Orobanche rapum-genistae* and Broad-leaved Helleborine were highlighted. Dedicated surveys carried out in 2024 confirmed the presence of Broad-leaved Helleborine on the site and along the L1157. Greater Broomrape was not recorded. Neither species are listed on the Flora Protection Order (2022). Historical records are discussed in the current Chapter.

5.220 **Lack of surveys for Amphibians:** The concerns in relation to lack of surveys for amphibians appears to have largely been related to the potential loss of the settlement ponds as part of the previous proposal. In the current proposal these ponds are being retained. Dedicated surveys confirmed the presence of Common Frog and Smooth Newt. These surveys included eDNA surveys and dedicated aquatic ecology studies. Ross Macklin (Triturus Environmental) pointed out that the movement of birds between waterbodies could lead to 'false' positives where trace eDNA gets transferred on plumage, legs and feeding remains of birds moving between waterbodies. There was one negative and one weakly positive (3 of 12 qPCR replicates) eDNA result for Smooth Newt from the quarry basin. Follow-up surveys in the quarry basin found no evidence of the presence of Smooth Newt in the quarry basin and the habitat present was not considered optimal for the species. In contrast Smooth Newt was confirmed present in the settlement ponds (qPCR 12 of 12 replicates) as well as direct observation in the aquatic surveys. Common Frog was recorded widely at the site and spawn and tadpoles were observed in pooled water and in the settlement ponds. There was an indication of the presence of Common Frog in the eDNA samples (1 of 12 qPCR and 10 of 12 qPCR replicates) from the quarry void. However, no evidence of Common Frog was observed in the quarry void during the dedicated surveys. As the water level was dropping throughout this period it is likely that conditions were evolving rapidly. It is likely that migration will have occurred as the quarry basin was dewatered. It is possible that some Common Frogs remain in the quarry sump area and this is addressed in the consideration of potential impacts and in the mitigation section of this Chapter.

5.221 **Badger surveys and impact on mammals:** The lack of dedicated surveys for non-volant mammals was raised in third-party submissions. Dedicated walkover surveys for these species were conducted as part of the current ecological assessment. The surveys included widespread deployment of trail cameras. Signs and camera records of non-volant mammals, including Badger, were recorded. No active Badger sett was recorded on-site but it has been mentioned in third party submissions that there are active setts on lands north of the proposed development site. Potential impacts on non-volant mammals are assessed as part of this Chapter, including the potential for conflicts with site traffic along the L1157. The mitigation measures outlined will provide foraging and breeding habitat for a range of non-volant mammal species.

5.222 **Inadequate aquatic ecology surveys:** There was a considerable discussion in relation to the potential for the previous application to impact upon aquatic habitats

and species. This was related to concerns in relation to the hydrological and hydrogeological impacts of the proposed development. It was suggested that there were inadequate aquatic ecology surveys. As part of the current Chapter the detailed aquatic ecology surveys undertaken in 2024 are outlined. These are comprehensive in nature and along with the detailed hydrology and hydrogeology assessments presented in Chapter 7 of the EIAR thoroughly address the concerns raised in relation to the previous application.

5.223 It is clear that the primary concerns raised in relation to the previous application have been thoroughly addressed as part of the current ecological assessment. As outlined in the following sections the potential effects of the development have informed detailed mitigation and biodiversity enhancement commitments presented to achieve a positive outcome for the local biodiversity over the lifetime of the development and into the post-closure period. The successful implementation of these measures will be monitored and reported upon throughout the project. The potential for adverse impacts upon European sites in the wider receiving environment is assessed in detail in the accompanying Natura Impact Statement.

POTENTIAL IMPACTS

5.224 Potential impacts of the proposed materials recovery / recycling facility and inert landfill on biodiversity are discussed below. The potential impacts are assessed based on the desktop and field surveys carried out as part of this assessment and the descriptions provided of the proposed operation-phase and post-closure phase of the proposed development.

5.225 Post-closure the site will have low levels of traffic (human and vehicles) and the landscaped features will continue to mature. There is no risk of significant negative effects on habitats and species within the site or in the wider area in the post closure period. Woodland habitats will continue to become more diverse and attractive for biodiversity.

Potential Effects on Designated Sites

Operational Phase

5.226 A Natura Impact Statement (NIS) in support of the Appropriate Assessment (AA) process has been prepared and accompanies the planning application for this proposed development.

5.227 The development site is not part of any designated site, nor does it require any resources from them; thereby ruling out any direct habitat loss at the designated sites in question (Table 5.6). Direct disturbance/displacement effects in relation to noise and/or visual cues on fauna associated with designated sites can be discounted in this case given the separation distance between the proposed development and European designated sites.

5.228 The Glenealy Woods pNHA and Deputy's Pass Nature Reserve SAC are located c. 1.1km and 1.6km north-west of the application site. However, as both are at a higher ground level, in different aquifers and upstream of the discharge to the Potters River, they will not be impacted by any site-based activities. There is no hydrological pathway from the Proposed Development Site to Glenealy Woods pNHA and Deputy's Pass Nature Reserve SAC.

5.229 Indirect habitat loss or deterioration of designated sites within the surrounding area could occur from the effects of run-off or discharge into the aquatic environment through impacts such as increased siltation, nutrient release and/or contamination. This requires connectivity between the site and the designated site in question

through watercourses and/or drainage ditches. The site is located within the Ovoca-Varty catchment and Redcross_SC_010 subcatchment. The Potters River (IE_EA_10P010500) is located to the north and east of the Proposed Development site. It flows in an easterly direction initially and then turns to flow in a south-easterly direction. It is located c. 300m from the site at its closest point. The Kilmacurra Stream [EPA name: Ballinameesda lower stream (IE_EA_10P010300)] is located c. 200m to the south of the application site and flows in an easterly direction, to its confluence with the Potters River.

5.230 Of the designated sites indicated in Table 5.6 above, only the Buckroney-Brittas Dunes and Fen SAC and pNHA is located downstream of the surface water discharge from the quarry. It is located at the coast, a distance of over 11.5km downstream and it is located on lands overlying a different aquifer (GWDTE-Buckroney-Brittas Fen) than that which occurs at the proposed development site.

5.231 As described in the accompanying NIS there are no aspects of the proposed development that are likely to give rise to significant effects on any of the other Natura 2000 sites that lack hydrological connectivity with the proposed inert landfill/waste recovery facility at Ballinclare. The only SAC located within the wider hinterland with mobile faunal qualifying interests is Wicklow Mountains SAC, situated 11.4km distant. This site has Otter as a QI, however it is located in an upland area, remote from the proposed development site and there is no pathway by which any significant effects are likely to arise. The other SACs are also distant from the proposed development and do not have mobile faunal QIs and there is no likelihood of significant effects arising in relation to their QI habitats.

5.232 Two of the SPA sites located in the wider area are coastal in nature and designated for the protection of waterbirds. The Murrough SPA (7.6km distant) comprises a coastal wetland complex that stretches for 13km from Kilcoole Station, east of Kilcoole village in the north to Wicklow town in the south and extends inland for up to 1km in places. The site includes an area of marine water to a distance of 200m from the low water mark. A shingle ridge runs along the length of the site and carries the Dublin-Wexford railway line. It is designated for the protection for a range of wintering waterbirds as well as breeding Little Tern, *Sternula albifrons*. There is no hydrological connectivity between the proposed development site and the Murrough SPA. There is no likelihood of significant effects arising on the Murrough SPA in relation to the proposed development. The site is coastal in nature, with no evidence of the habitats within the proposed development site playing an important role in the support of the Special Conservation Interest (SCI) species. Wicklow Head SPA (8.3km distant) is designated for the protection of a colony of breeding Kittiwake, *Rissa tridactyla*. It is a cliff-nesting seabird that rarely occurs inland. There is no likelihood of significant effects arising on Wicklow Hd. SPA as a result of the proposed development.

5.233 One upland SPA, Wicklow Mts. SPA (12.9km) is designated for the protection of two raptor species, Peregrine Falcon and Merlin, *Falco columbarius*. This is an extensive upland site, comprising a substantial part of the Wicklow Mountains. It supports a relatively stable breeding population of both raptor species (NPWS Conservation Objectives). It is highly unlikely that Peregrine Falcons breeding in the SPA forage in the vicinity of the proposed development site. The 'core foraging range' of peregrine is likely to be in the region of 2km from the nest (Pendlebury *et al*., 2011) with hunting trips rarely extending beyond 6km from the nest (Hardey *et al*., 2013). Whilst Peregrine Falcons are not considered to have home ranges they do defend nesting territories which are typically 2km to 9km in size. There is no likelihood that the proposed development will lead to significant effects on the breeding population of Peregrine Falcons within the Wicklow Mts. SPA. Merlin is an

upland nesting species not recorded on-site and unlikely to occur within the proposed development site. There is no likelihood of significant effects arising on the Merlin population in Wicklow Mts. SPA in relation to the proposed development.

5.234 In summary, in agreement with the ABP Inspector's report for the previous application at this site there is only one European site, Buckroney-Brittas Dunes & Fen SAC (000729) for which there is a likelihood of significant effects arising in the absence of adequate design and environmental controls. The QIs of this SAC are a range of dune, saltmarsh and alkaline fen habitats. It is possible that an uncontrolled release of contaminants from the site, along the Potters River to the SAC (c. 12km downstream) could lead to significant effects on the protected habitats. The Conservation Objectives document includes mapping of the QI habitats within the designated site and shows that the Potters River outfalls to the sea through an area with Fixed Coastal Dunes with herbaceous vegetation at the northern end of the SAC.

5.235 The remainder of Natura 2000 sites are screened out from further consideration because of the scale and location of the proposed development site, the nature of the QIs/SCIs and Conservation Objectives of these sites, distances involved and lack of credible ecological pathway for significant effects to be transmitted.

5.236 A NIS accompanies the current application which considers the potential impacts of the proposed development, on its own and in combination with other plans and projects to result in significant impacts on Buckroney-Brittas Dunes & Fen SAC. It is concluded that with the implementation of the design and mitigation measures described that the proposed development will not adversely affect the integrity of the Buckroney-Brittas Dunes & Fen SAC in view of the site's conservation objectives. No reasonable scientific doubt remains as to the absence of such effects.

Post Closure Phase

5.237 No elements of the post closure phase are identified as posing the risk of likely significant effects on any of the designated sites in the wider receiving environment.

Potential Effects on Habitats and Flora

5.238 Much of the proposed infrastructure will be accommodated within the low-value man-made habitats at the former concrete and asphalt production yard in the southeastern corner of the quarry. The proposed C&D waste recovery facility will be established within the footprint of an existing paved area immediately west of the existing access road.

5.239 A key difference between the current proposal and the previous application at this site is that the settlement ponds are to be retained. In addition, the infilled areas of the quarry void are to be progressively restored with native woodland species.

5.240 Habitats within the site are variable and include both semi-natural habitats, such as the woodland, grassland and bracken habitat, as well as artificial habitats such as the exposed siliceous rock (formerly quarry), large reservoirs of water throughout the site, buildings and hardstanding/bare ground surfaces. No species found on the FPO were recorded during the site survey. The Oak–birch–holly (WN1) woodland is the only habitat that is considered to be of high conservation significance. This habitat corresponds with the Annex I habitat (EU Habitats Directive) old sessile oak woods with *Ilex* and *Blechnum* in the British Isles (91A0). The area of this habitat within the site is approximately 0.5ha although some of this includes unmapped waterbodies and willow areas around the edges that could be considered wet woodland (WN6). The habitat is considered to be in reasonable condition although

it is at an early stage of infestation by invasive cherry laurel, which left unchecked has the potential to greatly reduce the quality of this habitat within the site. None of the proposed site infrastructure encroaches on the area of Annex I habitat.

5.241 The development will require the felling of a number of mature trees (conifers) to facilitate widening of the internal site access road. The landscaping plan as outlined will involve the early replanting of some screening vegetation.

5.242 The creation of habitats as part of the proposed development, including as part of the progressive restoration have the potential to increase the resource value of the site for fauna species, including invasive species such as Sika Deer. Planted trees will be vulnerable to grazing damage from deer.

5.243 Road widening and strengthening works along the L1157 will remove areas of grassy verge and potentially result in localised losses of some uncommon species (e.g. broad-leaved helleborine). Road works could potentially require delimbing of trees and local vegetation removal. With the exception of removal of some dead or poor condition trees near the site entrance it is not envisaged that any tree removal will be necessary along the L1157 to the junction with the R772.

5.244 The quarry basin will be infilled to a maximum of 80mOD through disposal of imported inert soil and stone waste and residual fines from the soil washing plant and the use of non-soil waste by-product for engineering, capping and/or landscaping purposes. Infilling will take place over an extended period and will retain an area of upper cliff-face to provide nesting habitat for Peregrine Falcon.

5.245 A wetland treatment system will be constructed at the west of the site in an area dominated by Scrub (WS1), Dry meadows and Grassy verges (GS2) and Wet grassland (GS4). This will see a localised loss of these habitats which are evaluated as having low-to-moderate conservation value. The construction of the wetland has the potential to cause damage and disturbance to habitats in the immediate vicinity of the construction footprint through site traffic and clearance works. However, the wetland area will itself have some biodiversity value which should increase over time as the planted elements mature and species colonise the wetland area. The wetland is to be retained post-closure.

5.246 Construction works and/or the importation of soil from other sites has the potential to inadvertently spread invasive plant species. In the absence of an Invasive Species Management Plan this could lead to damage and disruption of habitats on site or in the wider area.

5.247 Uncontrolled run-off of silt or other contaminants could lead to damage or disruption of aquatic and aquatic dependent habitats. This could also occur if there were uncontained or untreated leaks of hydrocarbons or other chemicals at the proposed development site during operation or into the post-closure period.

5.248 Inadequate dust suppression at the active sit and even along the primary haul route could lead to damaging levels of dust accumulating on plants and habitats. Studies have shown that high levels of dust can inhibit plant growth, reduce crop yields, and damage leaves and other wild plant parts. Dust can also affect the photosynthetic process in wild plants, leading to decreased carbon fixation and reduced water use efficiency (e.g. Farmer, 1993; Rahul *et al*. 2023). At levels of deposition that could lead to significant damage to plants and habitats the levels of the broadcast of dust would be expected to of significant nuisance to local residents and far in exceedance of EPA permitted levels.

5.249 In the absence of adequate mitigation measures there is potential for the proposed development to lead to loss and damage to local habitats and plant species. These effects are likely to be highly localised and are unlikely to see any significant loss of

species diversity or loss of area of habitats of higher conservation value. Effects on aquatic habitats are an exception, as they have the potential to lead to significant negative impacts on aquatic habitats and dependent species downstream of the site.

5.250 Post-closure the landscaped features will mature. This is likely to provide areas of higher value woodland habitat over large portions of the development footprint. In the absence of adequate monitoring and aftercare these areas could suffer losses from disease, grazing pressure and weather damage. Similarly, areas closer to the retained cliff base could be invaded by self-seeded scrub and trees that would diminish the value of the Peregrine Falcon nesting habitat.

Potential Effects on Non-volant Mammals

5.251 The construction and operational phase traffic has the potential to disturb and cause direct mortality to non-volant mammals, at the site and along the access route.

5.252 However, as described in Chapter 14 of the EIAR there will be a detailed traffic management plan with speed limits enforced. In addition, the normal working hours of the site decrease the likelihood of direct conflicts between traffic and non-volant mammal species that primarily crepuscular or nocturnally active. However, some traffic related non-volant mammal mortality is anticipated e.g. along the L1157 with Sika Deer especially common locally.

5.253 Within the site there was no resting place of any protected mammal species recorded from anywhere within the development footprint. It is likely that movement of plant and personnel may lead to localised avoidance of high-traffic areas by species such as Pine Marten and Badger.

5.254 Persistent noise related to site traffic and operation of plant is likely to locally displace diurnally active non-volant mammals from close to the active works area.

5.255 If edible and putrescible wastes are not stored in appropriate covered containers this could attract in scavenging species and cause disruption to the local fauna community.

5.256 The creation of the wetland area is likely to attract foraging Mink, *Mustela vison* and Otter, particularly as the landscaped features mature.

5.257 Landscaped areas, including woodland planted to improve screening and as part of the progressive restoration plan will provide foraging and breeding opportunities for a range of non-volant mammals. It will increase the quantum of attractive habitat for species such as Badger, Pine Marten and Fox on site. A reduction in grassland or revegetating bare ground on site is likely to lead to a local reduction in the number of Rabbits present on site.

5.258 The infilling of the quarry void may improve connectivity for certain species commuting across the proposed development site.

5.259 In the absence of appropriate mitigation and monitoring there is some potential for the proposed development to cause localised disturbance, displacement and mortality of non-volant mammal species. This effect is confined to the site preparation and operational phase. As landscaping measures mature, particularly in the post closure period the site will be attractive for a range of non-volant mammal species and has the potential to be an important biodiversity site in the local area.

Potential Effects on Bats

5.260 Bats are active crespuscularly and during the night and the site traffic associated with the proposed development is unlikely to cause disturbance or displacement to bats.

5.261 There was little evidence that the quarry basin was used by a high number or diversity of bat species. Dewatering the quarry basin is likely to further reduce the suitability of the quarry basin for foraging bats.

5.262 The woodland and scrub areas on site and along the L1157 were found to support a relatively diverse bat community. However, no active bat roost was recorded within the proposed development site. A number of bat roosts with multiple species are known from the wider locally area.

5.263 The felling of trees and clearance of vegetation has the potential to locally reduce the foraging and commuting resource value of the site by bats. In the event that any roosting bats are present at that time it could cause displacement or mortality of bats. Again, there was no evidence recorded of roosting bats recorded at the site. There is a considerable amount of suitable foraging and roosting habitat for bats in the immediate area around the proposed development site. Any temporarily or locally displaced bats are likely to successfully disperse into the surrounding area.

5.264 Site lighting has the potential to cause disturbance to locally foraging and commuting bats.

5.265 Construction of the wetland area will create a habitat attractive for foraging bats including Daubenton's Bat. Similarly, progressive restoration at the site will provide attractive habitat for foraging and commuting bats. As woodland matures it will provide some roosting opportunities for bats.

5.266 In the absence of appropriate mitigation the proposed development could lead to local disturbance and displacement of bats, particularly during the site preparation and operational phases.

Potential Effects on Birds

5.267 In the absence of appropriate design and/or mitigation there is potential for disturbance and displacement of the nesting Peregrine Falcon at the site. However, it was decided at an early stage in the project design to retain an area of cliff-face specifically to encourage the continued usage of the site by the species. The finished infill level will leave cliff-face of up to 15m in height at the north of the facility. In the absence of appropriate landscaping and mitigation there is the potential to make the site unattractive for nesting Peregrine Falcon. Peregrine Falcons are relatively tolerant of the operation of plant and machinery and this is reflected in their successful colonisation of active quarries throughout Ireland.

5.268 The continued dewatering of the void will reduce the attractiveness of the site for species such as Gulls. The retention of the settlement ponds is likely to see the persistence of species such as Teal, Moorhen, *Gallinula chloropus* and Mallard at the site.

5.269 The clearing of vegetation to facilitate the development will see the local loss of foraging and potential nesting habitat and cause localised disturbance for bird species. Clearance of vegetation (including along the road margin) and traffic across vegetated areas has the potential to cause disturbance, displacement and mortality of birds.

5.270 Traffic on-site and along the haul route is likely to marginally increase the rate of collision with birds in the local area during the operational period.

5.271 Inappropriate site lighting has the potential to cause disturbance and increase collision risk for birds commuting across the site.

5.272 Operational noise, especially percussive noise, is likely to cause localised disturbance and displacement of birds from the active facility. Most species will habituate to the noise disturbance associated with the operation of plant.

5.273 Inadequate storage and disposal of edible and putrescible wastes has the potential to increase the number of scavenging species on site and cause disruption to the existing local bird community.

5.274 Creation of the wetland habitat will create additional habitat suitable for waterbirds at the site.

5.275 The loss of areas of scrub and grassland has the potential to reduce the foraging and nesting potential of the site for high-value species that occur locally including Yellowhammer and Meadow Pipit.

5.276 The planting of areas of woodland will increase the resource value of the site for a range of woodland bird species and will in time provide suitable nesting habitat for a range of important and high conservation value species.

5.277 In the absence of the appropriate mitigation there is some potential of localised displacement, disturbance and mortality effects on birds.

Potential Effects on Aquatic Ecology

5.278 The riverine watercourses in the vicinity of Ballinclare Quarry, namely the Potters River and its tributaries the Ballinclare Stream and Ballinameesda Lower Stream, are small channels which have been historically modified, resulting in poorer hydromorphology and habitat quality. Whilst some good instream recovery was noted on the Potters River, significant siltation and hydromorphological pressures were evident in other parts of the catchment. Most notably, gross siltation was present on the Ballinameesda Lower Stream. Nevertheless, all three watercourses supported high conservation aquatic species, namely brown trout, lamprey (*Lampetra* sp.), European eel and or smooth newt. Smooth newt also recorded from the settlement ponds within the site boundary. The Red-listed (vulnerable) moss bladder snail was recorded from the Ballinclare Stream at site B2, the first Co. Wicklow record since 1968 (NBDC data). Furthermore, the nationally scarce water-stick insect was recorded from pond P3, a fourth record for Co. Wicklow (NBDC data).

5.279 Highly significant siltation pressures were observed on the Ballinameesda Lower Stream, causing a considerable reduction in the quality of fisheries and aquatic habitats. This short watercourse rises near Kilmacurragh Arboretum and drains (often intensive) pasture, through which it has been historically deepened and straightened. Compromised hydromorphology and livestock poaching resulted in gross siltation locally (e.g. site C1). Siltation pressures, whilst less severe, were also evident on the Potters River. Agriculture, afforestation, extractive industries and hydromorphology (channelisation) are known to be the primary threats to water quality in the wider survey area (EPA, 2020).

5.280 The settlement ponds on site are to be retained as part of the proposed development. Water flow will be directed through the ponds on an ongoing basis to keep the ponds aerated and open. It is likely these ponds will continue to be attractive for Smooth Newt and Common Frog. Continued dewatering of the quarry void has the potential to reduce the available habitat on site for Common Frog and other amphibian species. The use of the quarry sump as a water reservoir for water used in soil washing is likely to see a deterioration in the water quality in this ‘sump’

and it will become unsuitable for Common Frog and many other aquatic species. If Frogs or spawn are present at the onset of washing operations there could be morbidity and mortality effects on these species.

5.281 Following a review of the groundwater data as presented in Chapter 7 of the EIAR and the outline design of the inert landfill there is no concern of significant groundwater-mediated effects on the aquatic ecology in the wider receiving environment.

5.282 The constructed wetland has the potential to provide attractive habitat for a range of aquatic macroinvertebrates as well as Common Frog, Smooth Newt and possibly Common Eel.

5.283 In the absence of appropriate construction and operational phase mitigation measures there is potential for broadcast of silt and other contaminants into the aquatic environment. The Potters River downstream of the site is a good quality salmonid nursery and damaging run-off could lead to mortality or morbidity effects on sensitive species.

5.284 **Brown Trout and Atlantic Salmon:** Silt can smother spawning grounds, leading to reduced oxygen in the substrate where eggs are laid, which is crucial for embryonic development. Brown trout and Atlantic salmon, which rely on clean, oxygen-rich gravel beds, experience lower hatching success and may have deformities in young fish due to silt buildup. Contaminants, including silts and heavy metals, can impair growth and disrupt hormone levels, affecting development and behaviour of these species.

5.285 **Common Eel**: Eels are sensitive to siltation as it disrupts the habitat of their invertebrate prey and can impair their navigation during migration. Chemical contaminants in silt, such as PCBs and pesticides, can bioaccumulate in eels, affecting their immune systems and reproductive health.

5.286 **Lamprey species:** Lampreys, particularly the juvenile stage (ammocoetes), burrow in silt, making them highly susceptible to contaminants that settle in riverbeds. Pollutants like pesticides and heavy metals in silt can lead to developmental issues and reduced survival rates. Excessive silt also reduces the availability of suitable habitats for ammocoetes, crucial for the species' lifecycle.

5.287 **Smooth Newt:** Smooth newts are highly sensitive to water quality, particularly during breeding. Silt can reduce aquatic vegetation they depend on for egg-laying and shelter, and contaminants in silt can lead to physiological stress, reducing reproductive success and increasing mortality. Pollution has been linked to declines in amphibian populations, affecting their skin permeability and immune systems.

5.288 The design of the water management on-site will be according to the EPA licence requirements and there is no evidence that the dewatering of the quarry basin has resulted in any deterioration of the quality of water habitats downstream of the outfall. Whilst the dewatering process is already substantially completed, the uncontrolled discharge of water from the flooded quarry void and potential leak of fuels and other petroleum-based products during site preparation has the potential to reduce water quality of the off-site discharge and impact the Potters River and its salmonid system.

5.289 Fugitive dust leaving the site has the potential to wash into watercourses. This could lead to negative effects on water quality and sensitive aquatic habitats and species.

5.290 Uncontrolled discharge of water from the quarry void has the potential to create increased Arsenic concentrations in downstream surface water bodies (Potters

River). Arsenic is toxic to fish and invertebrates, even at low concentrations. It can disrupt enzyme function and interfere with energy production, leading to reduced growth, altered behaviour, and mortality. Fish, such as brown trout and Atlantic salmon, can accumulate arsenic in their tissues, which can cause long-term health issues, reduce reproductive success, and impair survival rates. Arsenic at higher concentrations can disrupt the food web, affecting predator-prey relationships as invertebrate populations (e.g., insects) decline. bioaccumulates in aquatic organisms and magnifies up the food chain, impacting predators like birds and mammals. This bioaccumulation can also pose a risk to aquatic plants and algae. Arsenic binds to sediments, and future riverbed disturbances can release it back into the water column. High levels of arsenic in sediment can also degrade habitat quality, affecting species that rely on the riverbed for spawning or foraging, such as lampreys and eels.

5.291 Discharge of poor-quality surface water from the proposed development site has the potential to affect the water quality downstream in the Potters River, which has the further potential to have secondary adverse effects on the Buckroney-Brittas Dunes and Fen SAC (and pNHA). However, the potential consequences for the designated site(s) are limited as they are primarily designated primarily for habitats associated with the sand dune and saltmarsh environment. The Buckroney Fen (part of the SAC), which could be considered more hydrologically dependent, is not hydrologically connected to the Potters River, and is fed by rivers/streams further south. As such, the potential effects from poor quality water in the Potters River are limited.

5.292 There will be no effluent discharge to any surface water course from the site following cessation of site operations. Natural storm/surface water run-off from the restored site will be directed via site drains to local watercourses. No negative effects on aquatic habitats and species are anticipated during the post-closure stage following the restoration of the site.

Potential Effects on Other Taxa

5.293 The removal and disturbance of vegetation during the site preparation phase will lead to localised declines in invertebrate abundance and diversity.

5.294 Any significant disimprovement of water quality in the ponds or rivers downstream of the site associated with the construction or operation of the facility would see a loss of aquatic macroinvertebrates.

5.295 The proposed phased landscaping will increase the amount of native woodland present at the site and this would be predicted in time to lead to an increase in the diversity of invertebrate species present on site. Similarly, the construction and retention of the wetland area has the potential to increase the diversity of Odonates present at the site.

Cumulative and In Combination Effects

5.296 Other plans and projects proposed or permitted in this area were reviewed using online resources including Wicklow County Council website, myplan.ie and An Bord Pleanála website.

5.297 In addition, relevant policies such as the National Biodiversity Plan (2023-2030) were considered when evaluating the potential for significant cumulative or in-combination effects arising in relation to the proposed development.

5.298 The project is consistent with local and national planning policy as set out in the accompanying planning report.

5.299 Cognisance has been taken in relation to European legislation such as the Water Framework Directive.

5.300 Recent planning applications in the local area relate to minor developments of one-off houses or modifications to agricultural or residential properties.

5.301 No potential for significant cumulative or in-combination effects in relation to biodiversity were identified as part of this process.

MITIGATION MEASURES

General Statement

5.302 The mitigation measures set out in the individual chapters of the EIAR will serve to minimise the potential negative effects of the proposed development on the receiving environment. Those related to control of emissions (dust, sediment and other water-borne pollutants, noise and light) and traffic are especially relevant to the minimising of risk to biodiversity. Where such measures are reiterated or restated here it is to further highlight the importance of implementing this mitigation.

5.303 A suitably qualified Ecological Clerk of Works (ECoW) for the project will be appointed and supervise and monitor the delivery of the mitigation and enhancement measures throughout the operation of the facility.

Designated Sites

5.304 As described in detail in the NIS that accompanies this application the only European site that was 'screened in' as having likely significant effects from the proposed development in the absence of appropriate mitigation is Buckroney-Brittas Dunes & Fen SAC. Using the Source-Pathway-Receptor (S-P-R) model the mechanism whereby such an effect would occur would be the uncontrolled release of contaminants to the Potters River (c. 12km upstream of the SAC). The river outfalls to the sea at the north of the coastal SAC, through an area of Fixed Dune habitat.

5.305 There is some potential (albeit limited) for a pollution event, or prolonged deterioration in water quality in the Potters River to measurably impact upon the Fixed Dune habitat. From the Conservation Objectives it is not considered likely that a mechanism exists by which a negative effect on the water quality in Potters River could measurably affect many of the attributes of the Fixed Dune system (e.g. Habitat Area or Distribution). On a precautionary basis the possibility of pollution of the Potters River negatively impacting Vegetation Structure (Sward height) and Vegetation Composition attributes is considered further.

5.306 Some mitigation measures were previously/are currently in place at the existing quarry to prevent any reduction in the quality of the local aquatic environment. These measures are in accordance with the "best practice / possible remedial measures" set out in Chapter 3.4 of the DoEHLG (2004) Quarries and Ancillary Activities: Guidelines for Planning Authorities.

5.307 The following measures will be implemented at the site to prevent leaks and/or spills, these are mitigation by prevention:

- The discharge water to the Potters River will comply with the conditions in the discharge licence (WPL116), or any required revision to the licence resulting from conditions associated with this application;
- The discharge water will be treated in a water treatment plant and will pass through the settlement lagoons / attenuation pond at the site;

- No refuelling of plant / machinery, maintenance or repairs will take place in the quarry void to prevent accidental spillages reaching the ground or being washed off in surface water;
- A refuelling pad with connection to hydrocarbon separator is provided at the application site, beside the workshop. All mobile plant and machinery refuelling will take place on the refuelling pad.
- Drip trays will be used for all other refuelling activities;
- All refuelling will be completed by competent / trained operatives;
- All plant / machinery maintenance and repairs will take place under cover in the existing workshop at the site or on the hardstand refuelling pad;
- All plant will be regularly maintained and inspected daily for leaks of fuels, lubricating oil or other contaminating liquids;
- Fuel storage will continue at the existing bunded storage facility at the site;
- All petroleum-based products (lubricating oils, waste oils, etc.) will be stored on drip trays under cover in the workshop to prevent pollution due to accidental leakages;
- Waste oil and grease containers will be stored under cover in the workshop. Waste containers will be collected and disposed of by a suitably licenced contractor;
- An emergency spill response kit (with containment booms, absorbent materials and drip tray) will be provided on-site to contain/ stop the migration of any accidental spillages, should they occur;
- Plant operators will be briefed during 'toolbox' talks and site induction on where the spill kit is kept and how and when it is deployed;
- Regular visual inspection and testing will be undertaken of the integrity of tanks, drums, bunded pallets and double skinned containers;
- Traffic management systems at the site will reduce potential conflicts between vehicles, and the potential risk of collisions and associated fuel spills or oil leaks; and
- Site speed limits will be implemented across the site to further reduce the likelihood and significance of collisions and the possibility of a fuel leak from such a collision.

5.308 Water in the quarry void will be pumped to the treatment plant and will then be routed to the settlement / attenuation ponds for further treatment (settlement) prior to discharge at the Potters River. Should the capacity of the settlement ponds be exceeded then additional ponds will be constructed.

5.309 All surface water discharges to the Potters River will comply with the emission limits set by the discharge licence [WPL116] (or those which may supersede them in any waste licence issued by the EPA).

5.310 The volume of water discharged from the site compared to flood flows in the Potters River is negligible and therefore the discharge water will not result in increased flood risk in the river.

5.311 The proposed mitigation measures outlined above for the construction stage will also be implemented for the operational stage particularly in relation to accidental fuel leaks and spillages of any hydrocarbons and the settlement / attenuation ponds for the removal of suspended solids.

5.312 The following additional mitigation measures will also be implemented:

- Suitable uncontaminated natural, undisturbed soil waste and/or soil by-product (i.e. non-waste) which conforms to an engineering specification will be imported for re-use in the construction of the 1m thick basal and side clay liners required for the inert landfill at the application site. This clay liner will be of sufficiently low permeability (less than or equal to $1x10^{-7}$m/s) to provide an appropriate level of protection to groundwater and the surrounding aquifer, in line with accepted inert landfill design standards. The proposed clay liner is intended to have the following functions:
- Prevent discharge through the base of the backfilled quarry void.
- Prevent discharge through the sidewalls of the backfilled quarry void.
- Ensure that the wider aquifer and underlying groundwater system and groundwater quality is physically protected by a pathway/flow barrier.

5.313 A separate drainage system will be provided to reduce pressures and dewater groundwater beneath the basal liner. Dewatered groundwater and storm runoff from the inert landfilling activities will be collected at a sump and pumped up to the proposed on-site (passive) wetland treatment system before being discharged off-site to the Potters River. The sizing and design of the wetland treatment system has been developed having regard to the likely contaminants (and concentrations thereof) which could be present in the inert soil / C&D waste intake source from construction sites.

5.314 The effectiveness of the proposed wetland treatment systems can be enhanced by the temporary addition of various, more active treatment systems, such as chemical dosing, aeration or other such processes. This can allow a wetland system to handle higher contaminant loads or flows for periods of time (should it be necessary) before reverting to more standard (passive) modes of operation, therefore providing flexibility should leachate generation rates and chemical constituents change over time.

5.315 Based on the initial assessment and design, the proposed wetland treatment system at Ballinclare Quarry will comprise the existing approved treatment system in addition to

(i) : wetland treatment system : comprising the following elements in series
  (a) Anaerobic (biochemical reactor) wetland;
  (b) Iron Sequestering Unit (ISU);
  (c) Aerobic wetland

(ii) A leachate reception tank : up to $50m^3$, self-bunded storage tank with level controls.

(iii) A pump house : housed is a standard shipping container (6.0m x 2.4m x 2.6m) containing feed, discharge and chemical dosing pumps;

(iv) Off-site discharge via existing ditch / drainage channels to the Ballinclare Stream and the Potters River further downstream.

5.316 All inert soil / C&D waste materials will be transported to the proposed materials recovery / recycling facility and inert landfill at Ballinclare Quarry using heavy goods vehicles (HGVs) comprising a mix of rigid body lorries and articulated trucks. All HGVs importing inert wastes (or by-product) to the facility will be required to pass over the new weighbridge which is to be installed at the northern end of the existing access road into the site.

5.317 On arrival, HGV drivers carrying the waste intake materials will identify themselves to staff at the site / weighbridge office before proceeding to the active backfilling / landfilling area or the C&D waste recovery / recycling facilities (as appropriate).

Staff will record the time and date of arrival, the nature, origin and weight of the imported materials (whether waste or by-product / engineering materials), the customer / Client name, the truck licence plate number, any relevant waste collection permit details and any further details which may be required by the EPA waste licence. All records of by-product and waste intake will be maintained on site for tracking and auditing purposes.

5.318 Only soil and stone waste and C&D material carried by authorised waste collectors will be accepted at the proposed waste facility at Ballinclare Quarry. All waste intake and acceptance will be subject to regulation and control by way of any EPA Waste Licence issued in respect of the proposed facility.

5.319 The source of each large consignment of soil imported to site for landfilling purposes shall be identified in advance and subject to basic characterisation testing to confirm that it is inert according to the criteria set by Council Decision 2003/33/EC and complies with site acceptance criteria. A site investigation report of other detailing the characterisation testing undertaken and results of testing will be submitted for approval in advance by customers, clients or sub-contractors intending to forward soil and stone materials to the facility. A suitably qualified person shall review the Site Investigation Report and determine if the material is suitable for acceptance. All HGVs transporting waste to the site must hold a valid Waste Collection Permit. Details of the hauliers permit shall be issued in advance. A letter of suitability shall be issued to the source site. Specific conditions if required will be outlined and agreed by the source site. Onsite CCTV cameras at the weighbridge will be fitted with vehicle recognition software to ensure the vehicle is pre-approved and carries a waste collection permit.

5.320 Operating procedures at the proposed facility will require all wastes forwarded for landfilling and/or recovery purposes to be pre-sorted at source, inert and free any non-hazardous / hazardous domestic, commercial or industrial wastes. Any waste consignment arriving at the facility which is identified with intermixed non-hazardous / hazardous wastes on foot of a CCTV / visual inspection at the weighbridge will be deemed unacceptable, will be immediately rejected and re-directed off-site to an alternative authorised (i.e. permitted or licensed) waste facility.

5.321 All inert soil and stone imported to the facility will be unloaded (end-tipped) from HGV's at the active landfilling areas. In addition to visual / CCTV inspection at the weighbridge, it will be inspected again by site based personnel at the landfilling area to ensure that there is no non-hazardous or hazardous waste intermixed with it. Should any intermixed, non-inert waste be identified at this point, the entire consignment will be rejected and reloaded back onto the HGV / tipper truck and the haulier directed to remove it off-site to another authorised (ie. permitted or licensed) waste facility.

5.322 Similarly, should any non-inert or non-C&D waste be identified amongst incoming waste consignments at the soil / C&D waste recovery areas, the entire waste consignment will also be rejected and reloaded onto the HGV / tipper truck and the haulier directed to remove it off-site to another authorised waste facility.

5.323 If, following its acceptance at the facility, there is any subsequent grounds for concern about the nature of the wastes imported to and/or handled on site, it will be segregated and transferred to the covered waste inspection and quarantine shed for closer inspection and classification testing to establish whether it can be accepted at the facility or not. Suspect waste will be identified on the basis of visual inspection (unusual colour, intermixed wastes etc.) or by smell during waste placement, handling and/or processing / crushing. A detailed record will be kept of all such inspections.

5.324 Should detailed inspection and/or any subsequent testing indicate that the quarantined materials are non-inert or cannot be accepted and used for landfilling or recovery / recycling purposes at the facility, they will be transferred off-site by to another appropriately authorised waste facility.

5.325 It is proposed to designate the former aggregate storage shed at the southern site boundary (at the southern limit of the former concrete / asphalt production area) as the on-site waste inspection and quarantine facility. The shed is roofed, closed on three sides and has a concrete floor, thereby protecting any suspect waste which might be transferred and held there from incident rainfall and avoiding the potential to generate (suspect) contaminated surface water run-off (and a requirement for separate wastewater collection and storage infrastructure).

5.326 Any significant volumes of intermixed non-inert C&D wastes (principally metal, timber, PVC pipes and plastic) inadvertently imported to the facility will be separated out and temporarily stored in skips or covered at the waste recovery area / shed or at the waste quarantine area prior to removal off-site to appropriately authorised waste facility. A representative sample will be taken (in accordance with waste licence requirements) of waste materials accepted at the inert landfill facility and subjected to compliance testing which focuses on key contaminant indicators. This data shall be used to confirm that the accepted soils are inert / acceptable (according to Council Decision 2003/33/EC) and/or comply with approved waste intake acceptance criteria. Compliance testing will be undertaken by the Applicant.

5.327 Only operators and/or haulage firms holding valid current waste collection permits will be engaged to transfer waste streams off-site to other authorised waste disposal or recovery facilities as required.

5.328 Potential impacts on local groundwater wells can occur if the imported soil/stone material does not conform to its inert status. Mitigation measures have been outlined above (Testing and Inspection of Imported Material) which will prevent this.

5.329 Local domestic wells have been identified, which are listed above within the Receiving Environment section (Groundwater abstractions and wells). Due to the broadly unproductive hard Diorite bedrock aquifer, impacts on groundwater levels distal to the site will not occur. This is borne out from on-site information in the observation wells (GW1-GW3) and from monitoring in local domestic wells.

5.330 Groundwater will flow within the upper clay/overburden layer as detailed in EIAR Chapter 7. Local domestic wells are either upgradient of the site or, where downgradient such as at CBDW1 and KHDW1, there is a surface watercourse (the Ballinameesda Lower [Kilmacurra] stream), which creates a hydraulic boundary between these local domestic wells and the site.

5.331 Local domestic wells also show no significant effect on groundwater levels due to the existing pumping from the site, at an average pumping rate of 72 m^3/hr. There is no response recorded in local wells from that pumping despite a water level change of ~13m.

5.332 Due to the measured groundwater levels and historical observations, no effects on local domestic/agricultural wells will occur as a result of the operation.

5.333 A clay liner will be installed underlying the waste material being infilled in the quarry. This clay liner will have sufficient low permeability (at least $1x10^{-7}$m/s) so as to hydraulically isolate it from the underlying bedrock aquifer.

5.334 Groundwater quality testing will be completed (on a quarterly basis) in wells GW1-GW3 to ensure there is no change in groundwater quality and no effects from the importation of the inert soil and stone material.

5.335 The mitigation measures outlined in relation to waste material will ensure no impacts occur to local groundwater quality.

5.336 Proven and effective control measures to mitigate any risks to groundwater quality or groundwater levels at the Proposed Development site are outlined above. Application of these controls will break the pathway between the potential source and the receptor.

5.337 Minor hydrocarbon detections were recorded at GW2. In-situ remedial works are proposed at GW2 to remove the minor hydrocarbon issue noted in that monitoring well during groundwater sampling.

5.338 The operational phase of the Proposed Development includes for a phased infilling of the quarry void. During Phase 1A, surface water runoff from the infill area will be captured and recirculated (or supplied to soil wash plant). Any excess runoff will be tankered off site. Surface water runoff from the C&D recovery yard will be captured and supplied to the soil wash plant, while runoff from the soil processing area will be directed towards a sump behind the wash plant for use in the washing process. Any excess water in the sump on the quarry floor will be treated prior to discharge.

5.339 Following the capping and restoring of the Phase 1A area, surface water runoff will be captured by a perimeter toe drain and discharged offsite.

5.340 Before the end of Phase 1A, the construction of the Integrated Constructed Wetland will commence. During that construction phase, excess water from the construction area will be pumped back to the quarry void. In addition, a temporary cutoff drain and double line of silt fencing will be used to ensure separation between the wetland construction area and the Ballinclare Stream.

5.341 During the follow-on Phase 1 development, the discharge/runoff from the inert landfilling areas will be collected and treated in a Integrated Constructed Wetland. Runoff from the C&D waste recovery and soil processing area will be supplied to the soil wash plant. Any excess water collecting in the sump on the quarry floor will be treated by the Siltbuster system and settlement ponds prior to discharge.

5.342 During Phase 2 of the development, whereby the land surface will be raised to 80mOD, the runoff from active inert landfill areas will be collected and treated within the Integrated Constructed Wetland. Runoff from capped landfill areas and the C&D waste recovery facilities will be collected and directed to temporary balancing ponds. Excess water in these balancing ponds will be treated by the Siltbuster system and settlement ponds prior to licensed discharge.

5.343 During Phase 3 of the Proposed Development, the water management system will mimic the Phase 2 operation outlined above.

5.344 Surface water quality testing of the discharge from the site will be completed on a quarterly basis (subject to any update of the existing discharge license and/or conditions within the Waste License)

5.345 As such, runoff from the site will be managed during each phase of the proposed infilling, as well as management of surface water from the C&D waste recovery facility, in order to mitigate against any potential effects on downstream watercourses following discharge off-site.

5.346 Mitigation for the protection of surface water quality during all phases of the proposed development are outlined above to deal with sediment, hydrocarbons, and dissolved metals.

5.347 There will be no significant change in flow discharging to the Potters River, and therefore flow (or volume) of water will not affect the functioning of the hydrology of the protected habitat.

5.348 The operation of the proposed site will not affect groundwater quality for the reasons outlined above, therefore it will not affect the GWB or the GWDTE waterbody within which Buckroney-Brittas Dunes and Fen SAC/pNHA occurs.

5.349 Once the site is backfilled, it will become vegetated and runoff and drainage will either percolate to ground or runoff and drain passively from the site via the wetland area. A small area of the southeastern corner of the site will drain locally to a suitably sized swale/attenuation pond and will discharge following treatment to the Kilmacurragh Stream.

5.350 Examination of the identified potential impacts on the receiving environment, provided the appropriate identified mitigation measures are put in place, then there are no significant residual impacts with respect to groundwater and/or surface water during the construction, operational or post-construction stages of the proposed development.

5.351 It is therefore considered that with the implementation of the mitigation measures outlined above, the proposed development will not result in any likely, significant effects on groundwater and/or surface water. As a result, there will be no significant potential to effect water quantity or water quality that flows down the Potters River towards Buckroney-Brittas Dunes and Fen SAC/pNHA.

5.352 With the application of the mitigation measures outlined in Chapter 7 of the EIAR (Hydrology & Hydrogeology), Chapter 8 (Air Quality), Chapter 14 (Traffic and Transportation) and general commitments in Chapter 16 (Mitigation and Monitoring) there is no residual risk of significant adverse impacts on Buckroney-Brittas Dunes and Fen SAC arising from the proposed development, or in combination with other projects and plans.

Habitats and Botanical

5.353 A pre-works survey will be carried out at the proposed development site and along the L1157 to record and map the presence of any invasive or protected plant species.

5.354 As currently recorded the development footprint should avoid direct impact on such species within the application site boundary. However, a re-survey of these species will be carried out at an appropriate time of year ahead of any site preparation or construction works (including along the L1157).

5.355 Any Third Schedule species present within the application site will be treated according to the measures described in the Invasive Species Management Plan (Appendix 5-D).

5.356 Similarly, excavating or movement of material in locations protected plant species are recorded will be avoided insofar as possible. In addition, an exclusion zone of a few metres will be demarcated around rare plants (e.g. Broad-leaved Helleborine) to prevent any accidental disturbance/damage to individual plants. If it is necessary to carry out development works in any of the locations where such species are present, the plants (including their roots and rhizomes) will be dug out and translocated to another location in similar habitat, shade and aspect in as near a location as possible where no future development works are planned. If any translocation of such species is required the NPWS will be consulted in advance with regards to permissions, timing of works and specialist advice on undertaking any translocations required.

5.357 Acceptance criteria to minimise the potential for import of soil contaminated with invasive species will be fully implemented. Annual site surveys for Third Schedule invasive species will be carried out during the operation and for three years post closure. A live Invasive Species Management Plan will be in operation and action control and eradication of any invasive plant species recorded on site during this period.

5.358 Cherry Laurel and Rhododendron occurring on site will be controlled and this will benefit the existing and proposed woodland habitats. Areas of scrub dominated by bramble will be partially removed to encourage the establishment of more diverse ground cover (to be monitored and repeated, if required).

5.359 To minimise the negative effects of grazing pressure on newly established woodland a Deer Management Plan will be implemented throughout the operation of the facility and for three years after the completion of tree planting on site. This will include the installation of deer-proof fencing around the perimeter of the site as well as active monitoring of the occurrence of deer within the application site (trail cameras) and active control of invasive deer species within the application site (if required).

5.360 The landscaping and aftercare commitments outlined in the EIAR will be fully implemented.

5.361 The clear-zone between the edge of the proposed woodland and the retained cliff-face will be maintained by annual mowing outside of the bird breeding season. This will control the potential encroachment of scrub and woodland into this area.

Non-volant Mammals

5.362 A pre-works survey will be carried out at the proposed development site and along the L1157 to record and map the presence of any resting or breeding places of non-volant mammals. If any resting or breeding places of such species are present within the works footprint this will be discussed with NPWS and any necessary derogation licences will be in place prior to works. This is a purely precautionary commitment as no such breeding or resting places were recorded during the site surveys in 2023/2024.

5.363 The speed limits and hours of activity proposed greatly reduce the risks of direct conflict with non-volant mammals.

5.364 All trees to be felled on site will be left on the ground for at least 24 hours before being logged and removed to allow any mammals present to depart.

5.365 The lighting proposed as part of the development will be downward directed and cowled to minimise light spill. All site lighting that is not required for operation or security will be extinguished.

5.366 Any excavations on site will be fitted with an egress board and inspected prior to works.

5.367 All edible and putrescible wastes will be stored and disposed of in an appropriate manner. Similarly, all construction materials will be stored and stockpiled at planned locations.

5.368 A deer-proof fence will be installed around the site application area and an invasive deer management plan will be implemented. Active monitoring of the occurrence of deer within the application site (trail cameras) and active control of invasive deer species within the application site (if required) will be carried out under licence from the NPWS. The deer management plan will continue for three years after the final planting of trees as part of the site restoration.

5.369 Mammal gates or openings (as per TII Guidance) will be provided along the deer fence at locations chosen by the ECoW at separation distances of 150m or less. This will ensure free passage into and out of the site by species such as Badger.

5.370 Roadkill along the L1157 from the R772 will be recorded daily with a log held for inspection at the site office.

5.371 No bioaccumulating pesticides will be used to control pest species on site. This will help protect the health of apex predators including Peregrine Falcon.

Bats

5.372 The lighting proposed as part of the development will be downward directed and cowled to minimise light spill. All site lighting that is not required for operation or security will be extinguished. All new site lighting will be provided in the colour temperature range of 2,700-3,000K to minimise disturbance to bats. This is a colour temperature that is less disruptive to bats (BCT 2010).

5.373 All trees to be felled on site will be left on the ground for at least 24 hours before being logged and removed to allow any bats present to depart.

5.374 Bat activity at the site will be monitored by deployment of passive detectors annually during the years of operation. A report on the species activity will be prepared and provided to the planning authority and NPWS.

Birds

5.375 There will be no felling of trees, or clearance of vegetation, including along the margins of the L1157 during the bird breeding season (March 1st to August 31st inclusive).

5.376 Site traffic will be limited to approved routes in order to limit accidental damage to potential foraging or nesting habitats.

5.377 The lighting proposed as part of the development will be downward directed and cowled to minimise light spill. All site lighting that is not required for operation or security will be extinguished.

5.378 Peregrine Falcon activity will be monitored annually during the operational phase, with liaison maintained with NPWS to inform the local wildlife officials of the status of Peregrine and their nests at the site.

5.379 All edible and putrescible wastes will be stored and disposed of in an appropriate manner. Similarly, all construction materials will be stored and stockpiled at planned locations.

5.380 Bird species diversity and abundance will be monitored annually throughout the years of operation. A report on the species activity will be prepared and provided to the planning authority and NPWS.

Aquatic Ecology

5.381 Mitigation measures outlined to protect water quality (as described above under the Designated Sites section) will be fully implemented.

5.382 A survey of the quarry basin/sump will be carried out prior to commencement of works and any Frogs or spawn present will be translocated under licence to the settlement ponds on site by a suitably qualified ecologist.

5.383 The quarry sump will be monitored each spring for any signs of Frog spawn and this will be translocated under licence (if required) to the settlement ponds or constructed wetland on site.

5.384 A survey of the species diversity of the constructed wetland and settlement ponds will be conducted every five years during the operational lifetime of the facility. A report will be prepared and submitted for the information of the planning authority and NPWS.

5.385 Biological water quality will be monitored annually upstream and downstream of the treated water discharge location. This information will be submitted as part of an annual report to the planning authority.

5.386 All requirements of the EPA for discharge of treated water from the facility will be fully observed.

Other Protected Fauna

5.387 The mitigation measures outlined in Chapter 7 (Hydrology & Hydrogeology) and Chapter 8 (Air Quality) will be fully implemented.

5.388 The lighting proposed as part of the development will be downward directed and cowled to minimise light spill. All site lighting that is not required for operation or security will be extinguished.

5.389 The landscaping plan will be implanted with substantial planting of native woodland across the site as part of phased restoration plans.

BIODIVERSITY ENHANCEMENT MEASURES

Measures to Encourage Biodiversity

5.390 The Wicklow County Development Plan (2022-2028) incorporates a comprehensive approach to biodiversity that aligns with its climate and environmental goals. A core objective of the plan is to protect and restore local biodiversity, particularly focusing on ecologically sensitive areas, such as the Wicklow Mountains, peatlands, and coastal habitats. The plan outlines commitments to improve biodiversity through responsible land use, restoration projects, and the implementation of "nature-based solutions" that address both biodiversity and climate issues.

5.391 A range of biodiversity enhancement measures are proposed to enhance to site's potential in combination with significant commitments to planting of native woodland as part of the progressive landscaping and restoration plan. Indicative locations of key biodiversity mitigation and enhancement commitments are shown on the Landscaping and Restoration Plan.

5.392 **Peregrine Falcon nesting box/ledge**: A permanent nesting box or ledge for Peregrine Falcon will be installed on the cliff-face that is to be retained post closure. It will be installed outside of the bird breeding season at a location chosen by and under the supervision of the ECoW. The ledge will be weatherproof and a camera mount will be provided to enable the nest-site to be easily monitored by NPWS. The ledge will be similar in design to that shown in Plate 5.39.

Plate 5-39
Peregrine Falcon Nest-Box

5.393 **Artificial Sand Martin colony:** An artificial Sand Martin nesting colony will be installed on-site at a location near the settlement ponds, or constructed wetland area. The award-winning design of the OPW precast Sand Martin wall from the Templemore Flood Relief Scheme will be adopted (see Plate 5.40). The walls are designed to stop predator access with the thickened stem and small entrance hole for the birds. The cavities within the wall widen out towards the rear for the nesting area, with removable caps fitted in the rear so that a bed of sand can be placed inside and to facilitate maintenance and monitoring.

Plate 5-40
Pre-cast Sand Martin Nesting Wall

5.394 **Maternity Bat roost boxes on existing buildings:** Two of the existing buildings on site will be fitted with a heated maternity bat roost box (https://www.nestbox.co.uk/products/heated-bat-box). This is a new design which provides three heated internal crevices approximately 20mm wide with 3 ceramic inserts. The boxes will be installed on an existing shed and on the unoccupied dwelling house under the supervision of the ECoW.

5.395 **Swift boxes with tape-lure:** A cluster of four Swift boxes will be installed on the external wall of the unoccupied house on site. These will be fitted with a sound system to play a tape lure call (under licence from NPWS) to attract Swifts. The boxes will be anti-predator Genesis Swift boxes (https://genesisnestboxes.ie/shop/genesis-swift-products/externally-fixed-swift-nest-box/) and will be fitted high beneath the eaves of the house under the supervision of the ECoW. A licence for tape-lure playback will be sought from NPWS and this will be in place ahead of any use of the tape-lure at the site. Recordings of swift calls will be played during the nesting season: early in the season to draw in birds who are nesting in the current year, or late in the season to interest birds who are looking for a nest for the following year.

5.396 **Bird and Bat boxes:** To encourage nesting birds and roosting bats at the site a selection of bird nest boxes and bat boxes will be erected at the site. The boxes will be weather resistant (woodcrete/recycled plastic) and the designs and erection locations will be chosen by a suitably qualified ecologist and these will be erected under the supervision of the ECoW. A total of 50 bird and 50 bat boxes will be erected at the site. Nest box design will include boxes suitable for Kestrel (Plate 5.41) and Barn Owl (Plate 5.42). Bat boxes will include pole mounted designs for areas where suitable trees are unavailable and also a large winter hibernation box These bird and bat boxes will be monitored annually by a suitably qualified ecologist and any boxes lost or damaged will be repaired or replaced throughout the operational lifetime of the project.

Plate 5-41
Woodcrete Kestrel Nest Box

Plate 5-42
Barn Owl Nest Box

5.397 **Grassland Management:** To encourage grassland species diversity the grassland areas at the west of the site will be managed according to the recommendations of the All-Ireland Pollinator Plan. The grassland areas will be mown, once a year (in September ideally) with all cuttings removed from the area. The area will not receive any fertiliser or pesticide input. In time this will enhance the floristic diversity present and encourage biodiversity. Permanent quadrats will be established and monitored by a suitably qualified botanist every three years during the operational phase of the facility. A monitoring report will be prepared and submitted for the information of the planning authority and NPWS.

RESIDUAL IMPACTS

Operational Phase

5.398 With the application of the identified mitigation measures there are no significant negative residual impacts with respect to biodiversity during the construction, operational or post-construction stages of the proposed development. The monitoring programme outlined will ensure that the success of the mitigation and biodiversity enhancement measures are measured and confirmed.

5.399 With the implementation of the biodiversity mitigation and enhancement measures it is likely that there will be net positive results for local biodiversity, particularly with the maturation of the progressively restored native woodland.

5.400 The design and mitigation measures outlined in Chapter 7 (Hydrology and Hydrogeology) will be effective in minimising any risk to water quality downstream of the site and there will be no adverse impacts on the Buckroney-Brittas Dunes & Fen SAC.

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Project
Environmental Impact Assessment Report
Materials Recovery / Recycling Facility
and Inert Landfill

Drawing Title
SITE LOCATION MAP

Scale	SLR Project No.
1:25,000 @ A3	065366.00001

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FIGURE 5-1

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Project
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Drawing Title
TRAIL CAMERA LOCATIONS

Scale	SLR Project No.
NOT TO SCALE @ A3	065366.00001

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FIGURE 5-2	**1**

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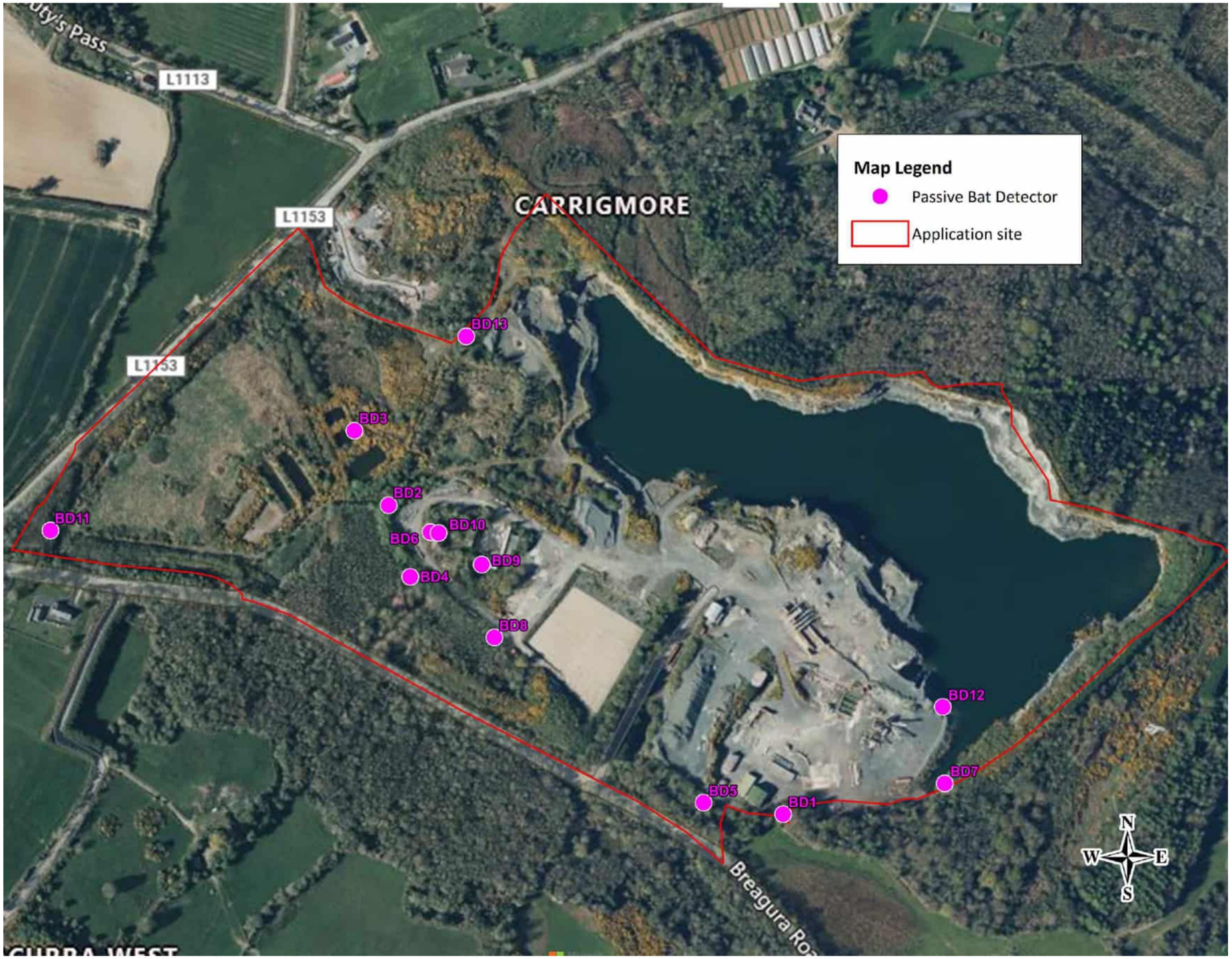

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Materials Recovery / Recycling Facility
and Inert Landfill

Drawing Title
BAT DETECTOR LOCATIONS

Scale	SLR Project No.
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Date	Date	Date	Date
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FIGURE 5-3

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Drawing Title
BAT SURVEY TRANSECTS

Scale	SLR Project No.
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FIGURE 5-4

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Drawing Title
BIRD SURVEY TRANSECTS

Scale	SLR Project No.
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FIGURE 5-5

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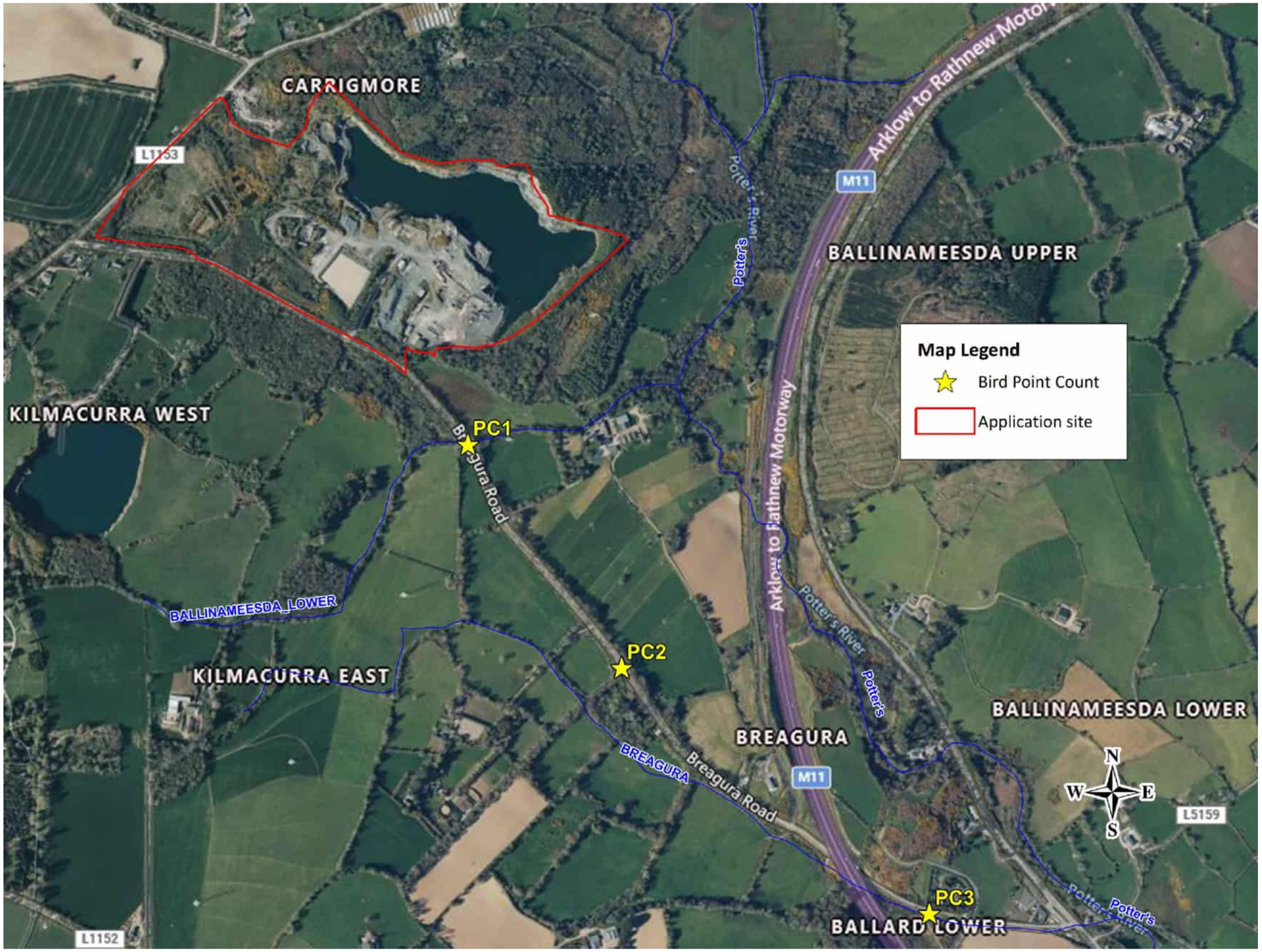

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Drawing Title
BIRD POINT COUNTS

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Drawing Number
FIGURE 5-6

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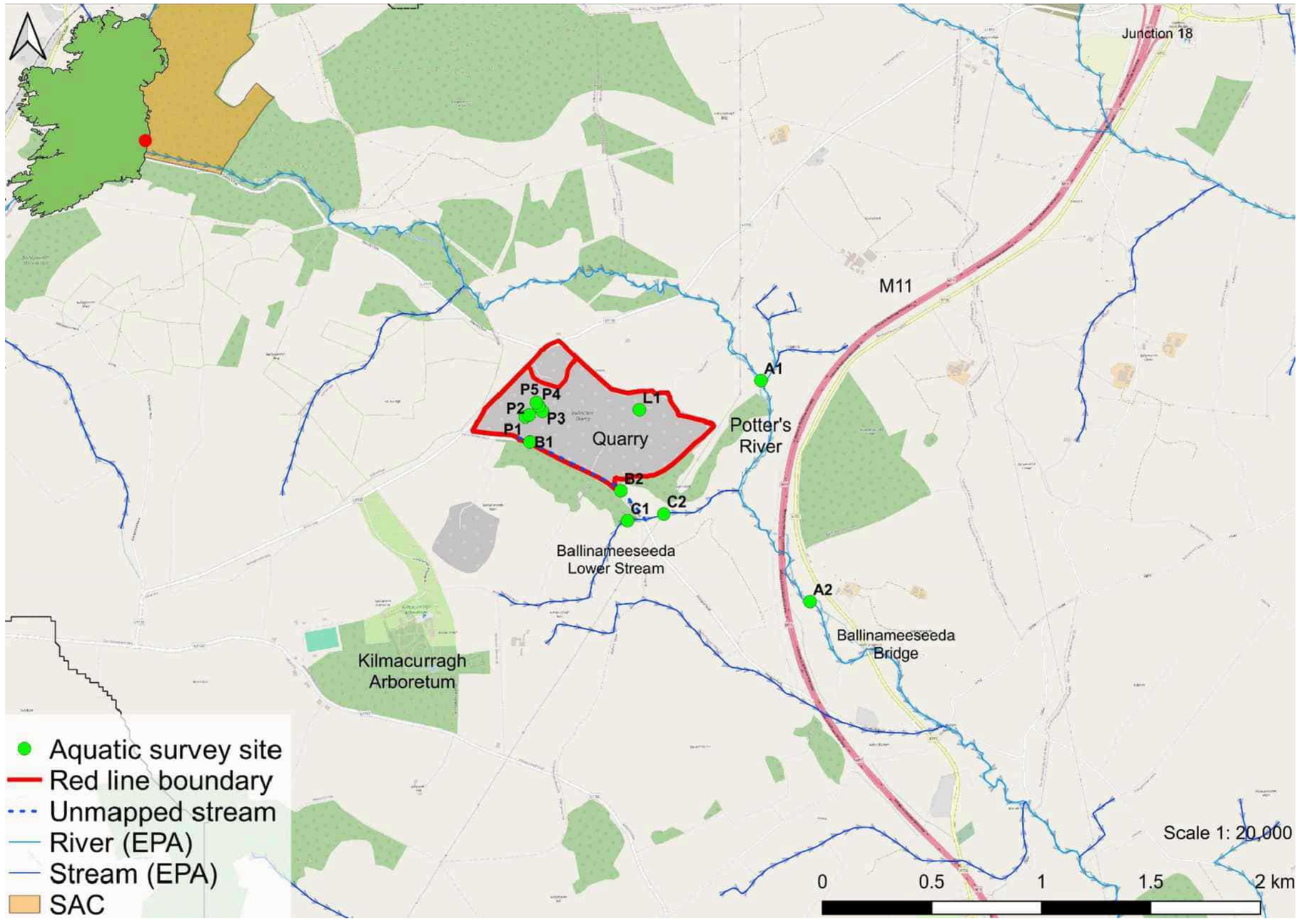

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Drawing Title
AQUATIC SURVEY COUNTS

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Drawing Number
FIGURE 5-7

Rev.
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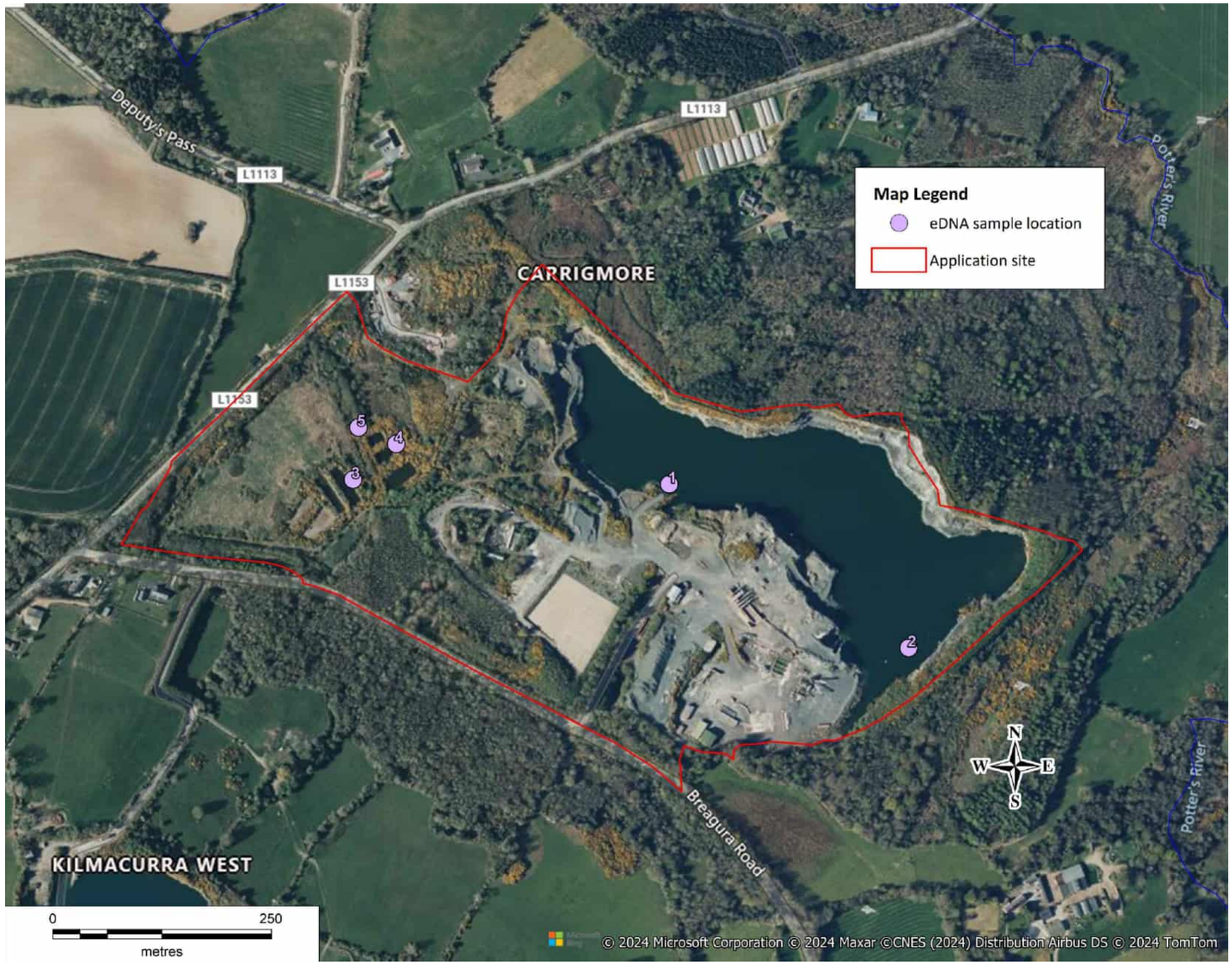

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Materials Recovery / Recycling Facility
and Inert Landfill

Drawing Title
eDNA SAMPLING

Scale	SLR Project No.
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Drawing Number
FIGURE 5-8

Rev.
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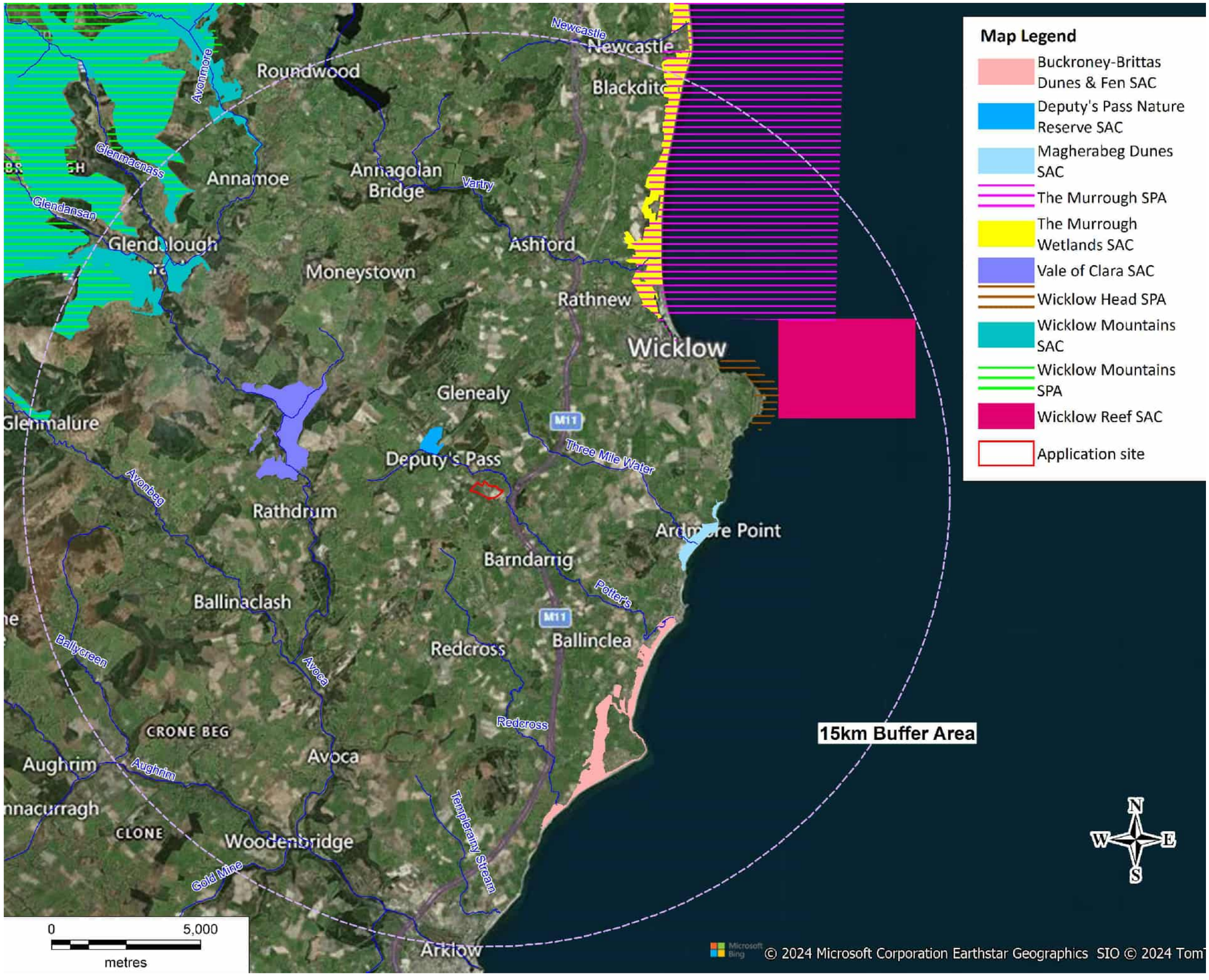

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Project: Environmental Impact Assessment Report
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Drawing Title: EUROPEAN SITES
WITHIN 15km

Scale	SLR Project No.
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Drawing Number: **FIGURE 5-9** Rev. **1**

01/11/2024

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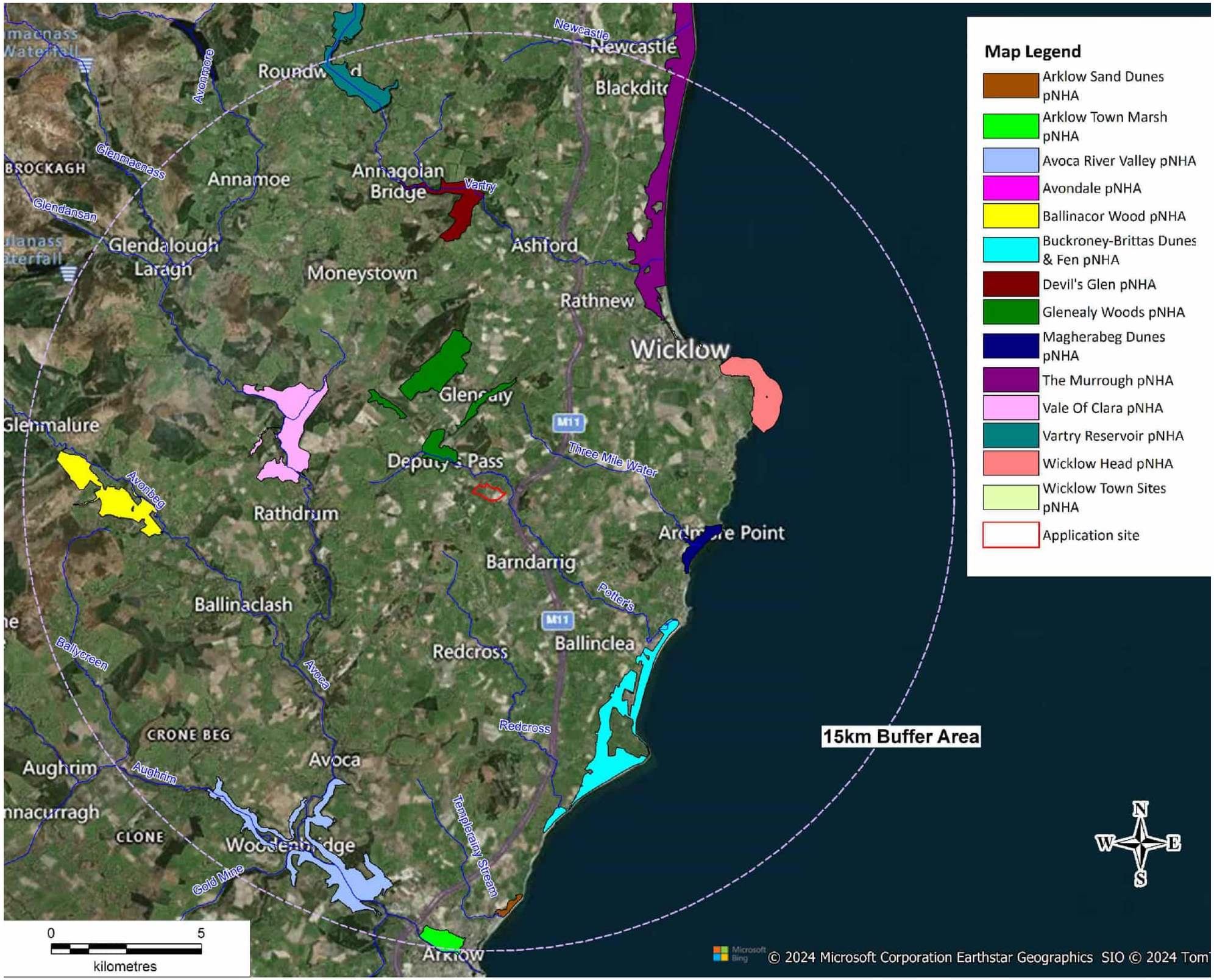

Map Legend

- Arklow Sand Dunes pNHA
- Arklow Town Marsh pNHA
- Avoca River Valley pNHA
- Avondale pNHA
- Ballinacor Wood pNHA
- Buckroney-Brittas Dunes & Fen pNHA
- Devil's Glen pNHA
- Glenealy Woods pNHA
- Magherabeg Dunes pNHA
- The Murrough pNHA
- Vale Of Clara pNHA
- Vartry Reservoir pNHA
- Wicklow Head pNHA
- Wicklow Town Sites pNHA
- Application site

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Project: Environmental Impact Assessment Report
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Drawing Title: NATIONALLY DESIG-
NATED SITES

Scale		SLR Project No.
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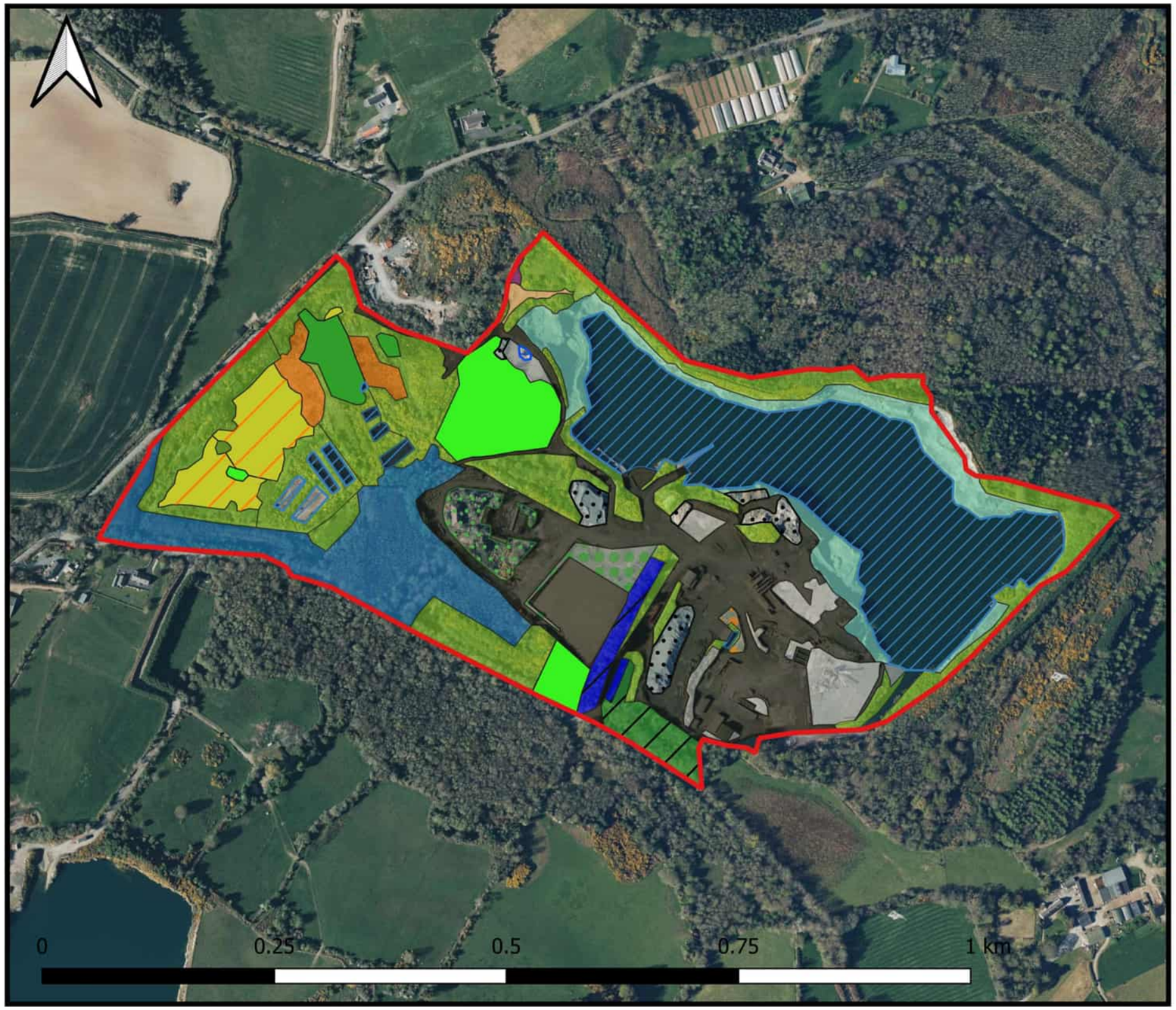
Drawing Number: **FIGURE 5-10**

Rev.: **1**



Legend

- Site

Habitats

- Buildings/artificial surfaces
- Spoil and bare ground
- Recolonising bare ground
- ED3/GS2 (mosaic)
- ED3/WS1 (mosaic)
- Exposed siliceous rock
- Mesotophic lakes
- Other artficial lakes and ponds
- Dry calcareous & neutral grassland
- Dry meadows/grassy verges
- Wet grassland
- Dense bracken
- Mixed broadleaved woodland
- Mixed conifer woodland
- Scattered trees/parkland
- Oak birch holly woodland
- Wet willow-alder-ash woodland
- Scrub
- Immature woodland

Bing Aerial

Figure 3: Target notes

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Project: Environmental Impact Assessment Report
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Drawing Title: HABITAT MAP

Scale		SLR Project No.
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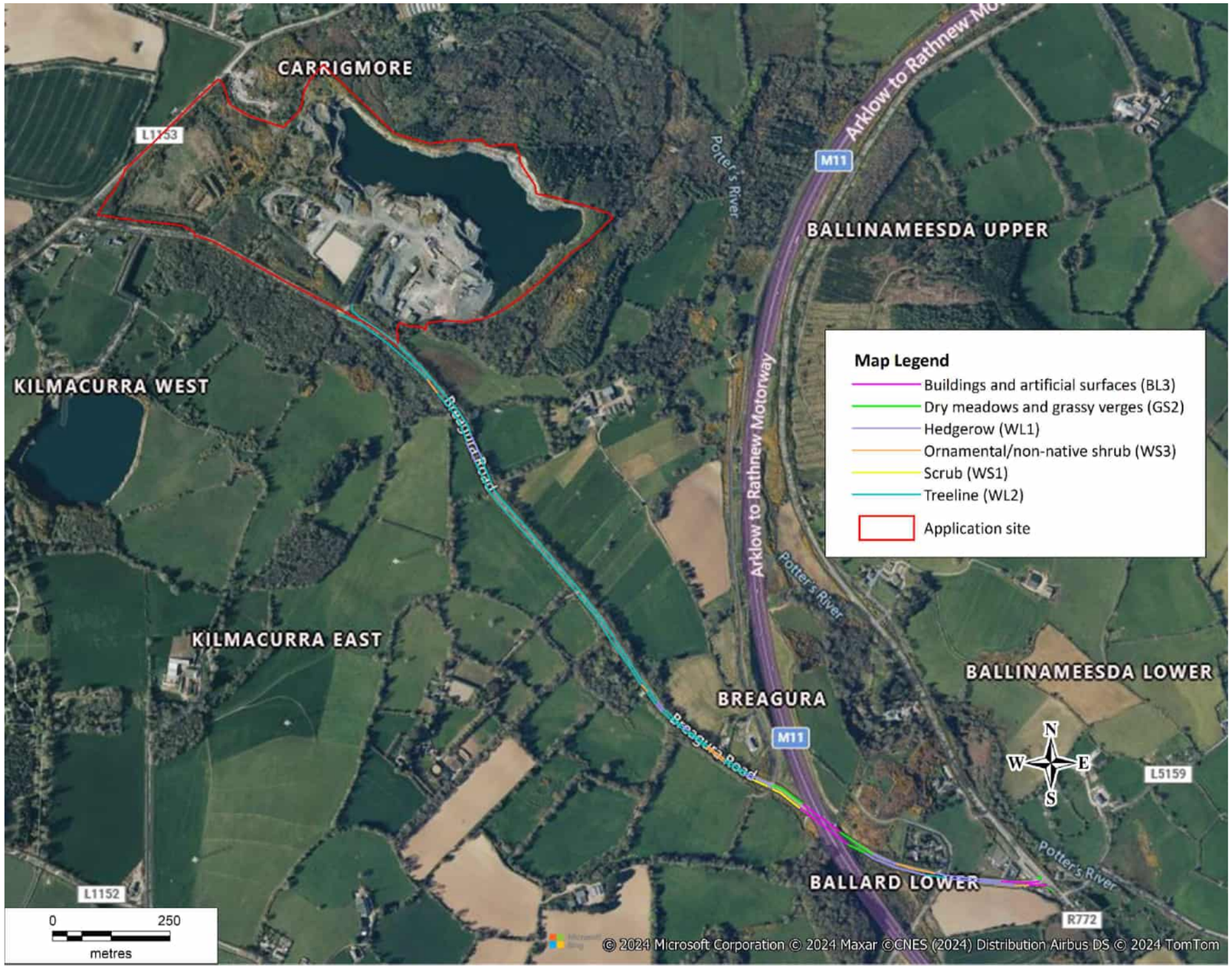
Date	Date	Date	Date
10/24	10/24	10/24	10/24

Drawing Number: **FIGURE 5-11** Rev.: **1**



Notes:

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Rev	Amendments	Date	By	Chk	Auth

SLR

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FINAL

Client
KILSARAN CONCRETE
Ballinclare Quarry, Kilbride, Co. Wicklow

Project
Environmental Impact Assessment Report
Materials Recovery / Recycling Facility
and Inert Landfill

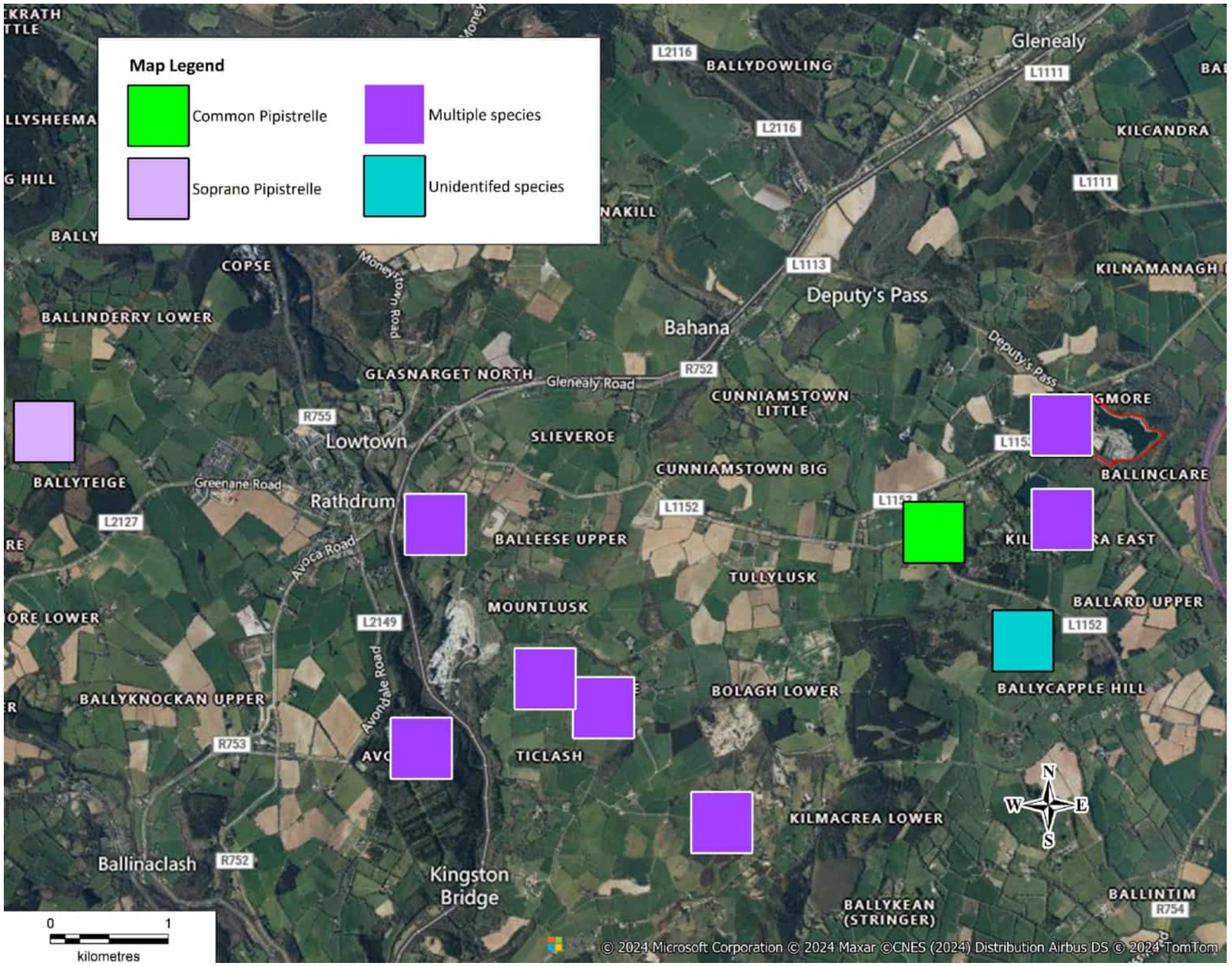
Drawing Title
HABITAT TYPES ALONG L1157

Scale	SLR Project No.
1:10,000 @ A3	065366.00001

Designed	Drawn	Checked	Authorised
GF	GF	GF	GF
Date	Date	Date	Date
10/24	10/24	10/24	10/24

Drawing Number
FIGURE 5-12

Rev.
1



Notes:

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KILSARAN CONCRETE
Ballinclare Quarry, Kilbride, Co. Wicklow

Project
Environmental Impact Assessment Report
Materials Recovery / Recycling Facility
and Inert Landfill

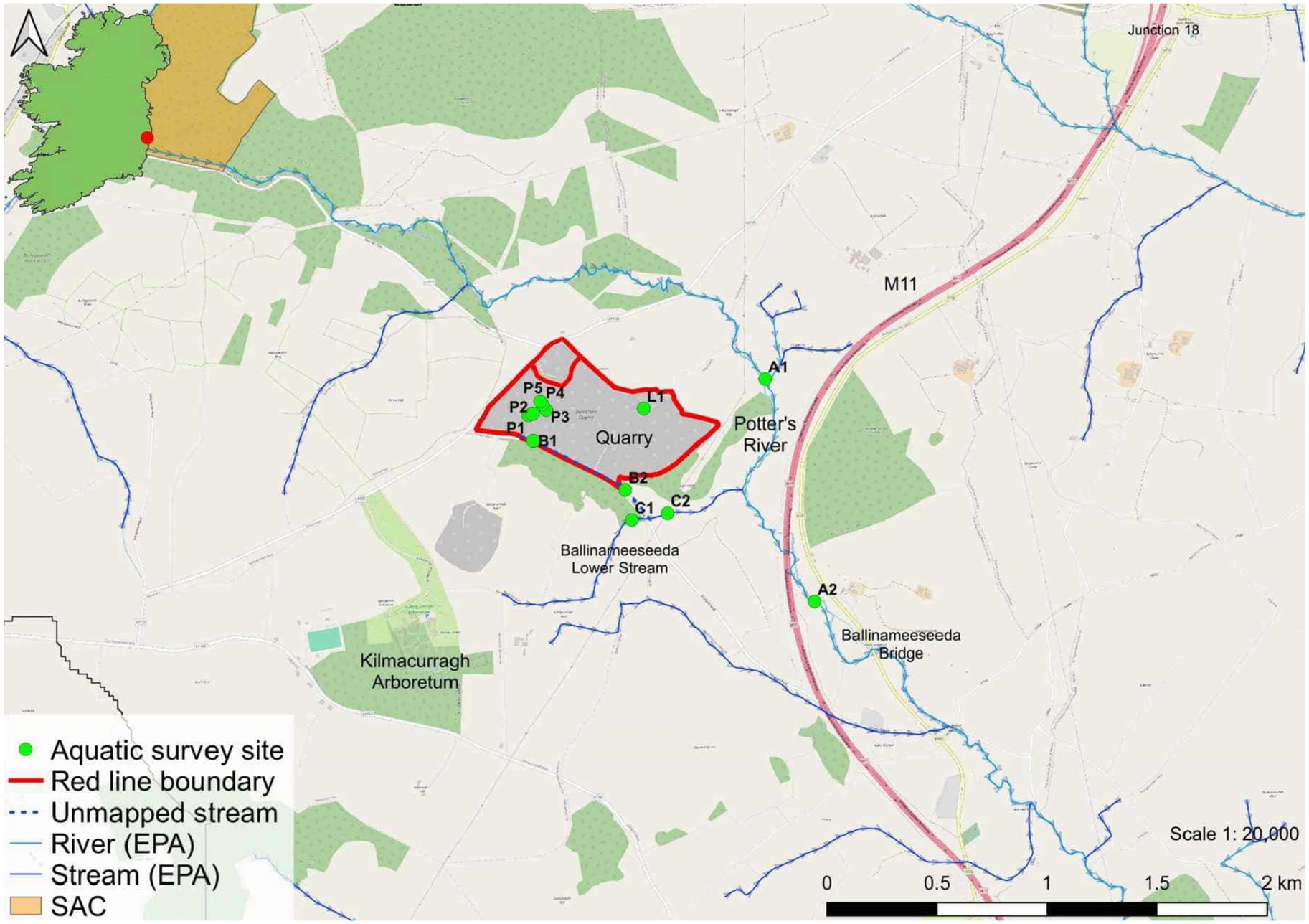
Drawing Title
BCI BAT ROOST LOCATIONS

Scale	SLR Project No.
1:40,000 @ A3	065366.00001

Designed	Drawn	Checked	Authorised
GF	GF	GF	GF
Date	Date	Date	Date
10/24	10/24	10/24	10/24

Drawing Number
FIGURE 5-13

Rev.
1



Notes:

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Drawing Status & Suitability Code
FINAL

Client
KILSARAN CONCRETE
Ballinclare Quarry, Kilbride, Co. Wicklow

Project
Environmental Impact Assessment Report
Materials Recovery / Recycling Facility
and Inert Landfill

Drawing Title
BIOLOGICAL WATER QUALITY

Scale	SLR Project No.
1:20,000 @ A3	065366.00001

Designed	Drawn	Checked	Authorised
GF	GF	GF	GF
Date	Date	Date	Date
10/24	10/24	10/24	10/24

Drawing Number
FIGURE 5-14

Rev.
1

APPENDICES

APPENDIX 5-A
eDNA laboratory analysis

Folio No: 1398-2024
Purchase Order: Invoice Number: 31109
Contact: Ecology Ireland Ltd
Issue Date: 06.06.2024

eDNA Report

Technical Report

SureScreen Scientifics

Folio No: 1398-2024
Purchase Order: Invoice Number: 31109
Contact: Ecology Ireland Ltd
Issue Date: 06.06.2024

SureScreen Scientifics

eDNA Analysis

Summary

When aquatic organisms inhabit a waterbody such as a pond, lake or river they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm the presence or absence of the target species within the waterbody.

Results

Lab ID	Site Name	OS Reference	Target Species	Sample Integrity Check	Result	Positive Replicates
FK2054	Ballinclare-Sample 5		Common frog	Pass	Negative	0
			European eel	Pass	Positive	11
			Smooth Newt	Pass	Positive	12
			White-clawed crayfish	Pass	Negative	0
FK2052	Ballinclare-Sample 4		Common frog	Pass	Positive	2
			European eel	Pass	Positive	12
			Smooth Newt	Pass	Positive	12
			White-clawed crayfish	Pass	Negative	0
FK2051	Ballinclare-Sample 1		Common frog	Pass	Positive	1

SureScreen Scientifics

		European eel	Pass	Negative	0
		Smooth Newt	Pass	Negative	0
		White-clawed crayfish	Pass	Negative	0
FK2050	Ballinclare-Sample 3	Common frog	Pass	Positive	11
		European eel	Pass	Negative	0
		Smooth Newt	Pass	Positive	12
		White-clawed crayfish	Pass	Negative	0
FK2048	Ballinclare-Sample 2	Common frog	Pass	Positive	10
		European eel	Pass	Negative	0
		Smooth Newt	Pass	Positive	3
		White-clawed crayfish	Pass	Negative	0

Matters affecting result: none

Reported by:Lauryn Jewkes

Approved by: Christopher Troth

Folio No:	1398-2024
Purchase Order:	Invoice Number: 31109
Contact:	Ecology Ireland Ltd
Issue Date:	06.06.2024

Methodology

Samples have been analyzed for the presence of target species eDNA following readily available and scientifically published eDNA assays and protocols.

The analysis is conducted in two phases. The sample first goes through an extraction process where the filter is incubated in order to obtain any DNA within the sample. The extracted sample is then tested via real-time PCR (also called q-PCR) for each of the selected target species. This process uses species-specific molecular markers (known as primers) to amplify a select part of the DNA, allowing it to be detected and measured in 'real time' as the analytical process develops. qPCR combines amplification and detection of target DNA into a single step. With qPCR, fluorescent dyes specific to the target sequence are used to label targeted PCR products during thermal cycling. The accumulation of fluorescent signals during this reaction is measured for fast and objective data analysis. The primers used in this process are specific to a part of mitochondrial DNA only found in each individual species. Separate primers are used for each of the species, ensuring no DNA from any other species present in the water is amplified. If target species DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If target DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent the risk of false positive and false negative results. True positive controls, negative controls, and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared. Stages of the analysis are also conducted in different buildings at our premises for added security. SureScreen Scientifics Ltd is ISO9001 accredited and participates in Natural England's proficiency testing scheme for GCN eDNA testing.

Interpretation of Results

Sample Integrity Check:

Laboratory Arrival:

When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results. Any samples which fail this test are rejected and eliminated before analysis.

Degradation and Inhibition check:

Analysis of the spiked DNA marker to see if there has been degradation or inhibition of the kit or sample, between the date it was made to the date of analysis. Degradation of the spiked DNA marker may indicate a risk of false negative results. If inhibition is detected, samples are purified and re-analyzed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result:

Presence of eDNA (Positive/Negative/Inconclusive)

Positive: DNA was identified within the sample, indicative of species presence within the sampling location at the time the sample was taken or within the recent past.

Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for species presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. Even a score as low as 1/12 is declared positive. 0/12 indicates negative species presence.

Negative: eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of species absence, however, does not exclude the potential for species presence below the limit of detection.

Inconclusive: Controls indicate inhibition or degradation of the sample, resulting in the inability to provide conclusive evidence for species presence or absence.

APPENDIX 5-B
Historical botanical records in overlapping grid squares

T28 (10km Grid Square) – Historical Botanical Records (NBDC).

Scientific Name	Common Name	Status
Alnus glutinosa	Alder	LC
Smyrnium olusatrum	Alexanders	LC
Epilobium ciliatum	American Willowherb	LC
Persicaria amphibia	Amphibious Bistort	LC
Poa annua	Annual Meadow-grass	LC
Malus pumila	Apple	LC
Fraxinus excelsior	Ash	LC
Populus tremula	Aspen	LC
Leontodon autumnalis	Autumn Hawkbit	LC
Potentilla sterilis	Barren Strawberry	LC
Laurus nobilis	Bay	LC
Fagus sylvatica	Beech	LC
Erica cinerea	Bell Heather	LC
Vaccinium myrtillus	Bilberry	LC
Lathyrus linifolius	Bitter-vetch	LC
Medicago lupulina	Black Medick	LC
Populus nigra	Black-poplar	LC
Prunus spinosa	Blackthorn	LC
Hyacinthoides non-scripta	Bluebell	LC
Stellaria alsine	Bog Stitchwort	LC
Borago officinalis	Borage	LC
Rubus fruticosus agg.	Bramble	LC
Sparganium erectum	Branched Bur-reed	LC
Rumex obtusifolius	Broad-leaved Dock	LC
Epipactis helleborine	Broad-leaved Helleborine	LC
Epilobium montanum	Broad-leaved Willowherb	LC

Scientific Name	Common Name	Status
Veronica beccabunga	Brooklime	LC
Cytisus scoparius	Broom	LC
Ajuga reptans	Bugle	LC
Typha latifolia	Bulrush	LC
Rosa spinosissima	Burnet Rose	LC
Vicia sepium	Bush Vetch	LC
Buddleja davidii	Butterfly-bush	LC
Hypochaeris radicata	Cat's-ear	LC
Ranunculus sceleratus	Celery-leaved Buttercup	LC
Myosotis discolor	Changing Forget-me-not	LC
Prunus laurocerasus	Cherry Laurel	LC
Cichorium intybus	Chicory	LC
Galium aparine	Cleavers	LC
Dactylis glomerata	Cock's-foot	LC
Tussilago farfara	Coltsfoot	LC
Aquilegia vulgaris	Columbine	LC
Agrostis capillaris	Common Bent	LC
Lotus corniculatus	Common Bird's-foot-trefoil	LC
Centaurium erythraea	Common Centaury	LC
Stellaria media	Common Chickweed	LC
Valerianella locusta	Common Cornsalad	LC
Elytrigia repens	Common Couch	LC
Melampyrum pratense	Common Cow-wheat	LC
Viola riviniana	Common Dog-violet	LC
Lemna minor	Common Duckweed	LC
Veronica persica	Common Field-speedwell	LC
Scrophularia nodosa	Common Figwort	LC

Scientific Name	Common Name	Status
Hedera helix subsp. helix	Common Ivy	LC
Centaurea nigra	Common Knapweed	LC
Malva sylvestris	Common Mallow	LC
Polygala vulgaris	Common Milkwort	LC
Cerastium fontanum	Common Mouse-ear	LC
Urtica dioica	Common Nettle	LC
Senecio jacobaea	Common Ragwort	LC
Fumaria muralis	Common Ramping-fumitory	LC
Phragmites australis	Common Reed	LC
Ononis repens	Common Restharrow	LC
Rumex acetosa	Common Sorrel	LC
Eleocharis palustris	Common Spike-rush	LC
Dactylorhiza fuchsii	Common Spotted-orchid	LC
Valeriana officinalis	Common Valerian	LC
Vicia sativa subsp. segetalis	Common Vetch	LC
Juncus conglomeratus	Compact Rush	LC
Centaurea cyanus	Cornflower	LC
Helleborus argutifolius	Corsican Hellebore	LC
Anthriscus sylvestris	Cow Parsley	LC
Primula veris	Cowslip	LC
Malus sylvestris	Crab Apple	LC
Agrostis stolonifera	Creeping Bent	LC
Ranunculus repens	Creeping Buttercup	LC
Potentilla reptans	Creeping Cinquefoil	LC
Holcus mollis	Creeping Soft-grass	LC
Cirsium arvense	Creeping Thistle	LC
Cynosurus cristatus	Crested Dog's-tail	LC

Scientific Name	Common Name	Status
Cardamine pratensis	Cuckooflower	LC
Rumex crispus	Curled Dock	LC
Geranium dissectum	Cut-leaved Crane's-bill	LC
Bellis perennis	Daisy	LC
Succisa pratensis	Devil's-bit Scabious	LC
Rosa canina	Dog-rose	LC
Betula pubescens	Downy Birch	LC
Helictotrichon pubescens	Downy Oat-grass	LC
Viola reichenbachiana	Early Dog-violet	LC
Aira praecox	Early Hair-grass	LC
Orchis mascula	Early-purple Orchid	LC
Sambucus nigra	Elder	LC
Circaea lutetiana	Enchanter's-nightshade	LC
Ulmus procera	English Elm	LC
Sedum anglicum	English Stonecrop	LC
Arrhenatherum elatius	False Oat-grass	LC
Primula vulgaris x veris = P. x polyantha	False Oxlip	LC
Brachypodium sylvaticum	False-brome	LC
Catapodium rigidum	Fern-grass	LC
Tanacetum parthenium	Feverfew	LC
Convolvulus arvensis	Field Bindweed	LC
Viola arvensis	Field Pansy	LC
Luzula campestris	Field Wood-rush	LC
Rosa arvensis	Field-rose	LC
Glyceria fluitans	Floating Sweet-grass	LC
Apium nodiflorum	Fool's-water-cress	LC
Digitalis purpurea	Foxglove	LC

Scientific Name	Common Name	Status
Ligustrum ovalifolium	Garden Privet	LC
Alliaria petiolata	Garlic Mustard	LC
Veronica chamaedrys	Germander Speedwell	LC
Festuca gigantea	Giant Fescue	LC
Heracleum mantegazzianum	Giant hogweed	Scheduled Invasive
Gunnera tinctoria	Giant-rhubarb	LC
Salix caprea	Goat Willow	LC
Galega officinalis	Goat's-rue	LC
Ulex europaeus	Gorse	LC
Muscari neglectum	Grape-hyacinth	LC
Epilobium hirsutum	Great Willowherb	LC
Luzula sylvatica	Great Wood-rush	LC
Lotus pedunculatus	Greater Bird's-foot-trefoil	LC
Vinca major	Greater Periwinkle	LC
Plantago major	Greater Plantain	LC
Carex riparia	Greater Pond-sedge	LC
Stellaria holostea	Greater Stitchwort	LC
Pentaglottis sempervirens	Green Alkanet	LC
Alnus incana	Grey Alder	LC
Aegopodium podagraria	Ground-elder	LC
Glechoma hederacea	Ground-ivy	LC
Senecio vulgaris	Groundsel	LC
Viburnum opulus	Guelder-rose	LC
Conyza sumatrensis	Guernsey Fleabane	LC
Cardamine hirsuta	Hairy Bitter-cress	LC
Luzula pilosa	Hairy Wood-rush	LC
Juncus inflexus	Hard Rush	LC

Scientific Name	Common Name	Status
Crataegus monogyna	Hawthorn	LC
Corylus avellana	Hazel	LC
Polygala serpyllifolia	Heath Milkwort	LC
Veronica officinalis	Heath Speedwell	LC
Calluna vulgaris	Heather	LC
Calystegia sepium	Hedge Bindweed	LC
Sisymbrium officinale	Hedge Mustard	LC
Stachys sylvatica	Hedge Woundwort	LC
Oenanthe crocata	Hemlock Water-dropwort	LC
Geranium robertianum	Herb-Robert	LC
Ilex aquifolium x perado = I. x altaclerensis	Highclere Holly	LC
Epilobium parviflorum	Hoary Willowherb	LC
Heracleum sphondylium	Hogweed	LC
Ilex aquifolium	Holly	LC
Lonicera periclymenum	Honeysuckle	LC
Carpinus betulus	Hornbeam	LC
Aesculus hippocastanum	Horse-chestnut	LC
Alnus cordata	Italian Alder	LC
Hedera helix	Ivy	LC
Veronica hederifolia	Ivy-leaved Speedwell	LC
Cymbalaria muralis	Ivy-leaved Toadflax	LC
Prunus serrulata	Japanese Cherry	LC
Fallopia japonica	Japanese Knotweed	Scheduled Invasive
Juncus articulatus	Jointed Rush	LC
Anthyllis vulneraria	Kidney Vetch	LC
Polygonum aviculare	Knotgrass	LC
Galium verum	Lady's Bedstraw	LC

Scientific Name	Common Name	Status
Ranunculus ficaria	Lesser Celandine	LC
Leontodon saxatilis	Lesser Hawkbit	LC
Persicaria campanulata	Lesser Knotweed	LC
Ranunculus flammula	Lesser Spearwort	LC
Stellaria graminea	Lesser Stitchwort	LC
Trifolium dubium	Lesser Trefoil	LC
Arum maculatum	Lords-and-Ladies	LC
Pedicularis sylvatica	Lousewort	LC
Hippuris vulgaris	Mare's-tail	LC
Ammophila arenaria	Marram	LC
Gnaphalium uliginosum	Marsh Cudweed	LC
Alopecurus geniculatus	Marsh Foxtail	LC
Lathyrus palustris	Marsh Pea	LC
Hydrocotyle vulgaris	Marsh Pennywort	LC
Senecio aquaticus	Marsh Ragwort	LC
Cirsium palustre	Marsh Thistle	LC
Stachys palustris	Marsh Woundwort	LC
Galium palustre	Marsh-bedstraw	LC
Caltha palustris	Marsh-marigold	LC
Ranunculus acris	Meadow Buttercup	LC
Alopecurus pratensis	Meadow Foxtail	LC
Lathyrus pratensis	Meadow Vetchling	LC
Filipendula ulmaria	Meadowsweet	LC
Crocosmia pottsii x aurea = C. x crocosmiiflora	Montbretia	LC
Artemisia vulgaris	Mugwort	LC
Malva moschata	Musk-mallow	LC
Umbilicus rupestris	Navelwort	LC

Scientific Name	Common Name	Status
Lapsana communis	Nipplewort	LC
Papaver somniferum	Opium Poppy	LC
Chrysosplenium oppositifolium	Opposite-leaved Golden-saxifrage	LC
Carex ovalis	Oval Sedge	LC
Leucanthemum vulgare	Oxeye Daisy	LC
Quercus robur	Pedunculate Oak	LC
Geranium versicolor	Pencilled Crane's-bill	LC
Carex pendula	Pendulous Sedge	LC
Lolium perenne	Perennial Rye-grass	LC
Euphorbia peplus	Petty Spurge	LC
Conopodium majus	Pignut	LC
Carex pilulifera	Pill Sedge	LC
Matricaria discoidea	Pineappleweed	LC
Veronica catenata	Pink Water-speedwell	LC
Oxalis articulata	Pink-sorrel	LC
Sonchus asper	Prickly Sow-thistle	LC
Primula vulgaris	Primrose	LC
Lythrum salicaria	Purple-loosestrife	LC
Lychnis flos-cuculi	Ragged-Robin	LC
Allium ursinum	Ramsons	LC
Rubus idaeus	Raspberry	LC
Alnus rubra	Red Alder	LC
Odontites vernus	Red Bartsia	LC
Trifolium pratense	Red Clover	LC
Lamium purpureum	Red Dead-nettle	LC
Festuca rubra	Red Fescue	LC
Centranthus ruber	Red Valerian	LC

Scientific Name	Common Name	Status
Phalaris arundinacea	Reed Canary-grass	LC
Carex remota	Remote Sedge	LC
Rhododendron	Rhododendron ponticum	Scheduled Invasive
Plantago lanceolata	Ribwort Plantain	LC
Chamerion angustifolium	Rosebay Willowherb	LC
Leontodon hispidus	Rough Hawkbit	LC
Ranunculus omiophyllus	Round-leaved Crowfoot	LC
Sorbus aucuparia	Rowan	LC
Salix cinerea subsp. oleifolia	Rusty Willow	LC
Sanguisorba minor	Salad Burnet	LC
Carex arenaria	Sand Sedge	LC
Sanicula europaea	Sanicle	LC
Anagallis arvensis	Scarlet Pimpernel	LC
Tripleurospermum maritimum	Sea Mayweed	LC
Cerastium diffusum	Sea Mouse-ear	LC
Eryngium maritimum	Sea-holly	LC
Prunella vulgaris	Selfheal	LC
Quercus petraea	Sessile Oak	LC
Juncus acutus	Sharp Rush	LC
Juncus acutiflorus	Sharp-flowered Rush	LC
Jasione montana	Sheep's-bit	LC
Capsella bursa-pastoris	Shepherd's-purse	LC
Epilobium obscurum	Short-fruited Willowherb	LC
Betula pendula	Silver Birch	LC
Potentilla anserina	Silverweed	LC
Hypericum pulchrum	Slender St John's-wort	LC
Tilia cordata	Small-leaved Lime	LC

Scientific Name	Common Name	Status
Crepis capillaris	Smooth Hawk's-beard	LC
Poa pratensis	Smooth Meadow-grass	LC
Sonchus oleraceus	Smooth Sow-thistle	LC
Achillea ptarmica	Sneezewort	LC
Symphoricarpos albus	Snowberry	LC
Galanthus nivalis	Snowdrop	LC
Bromus hordeaceus	Soft-brome	LC
Juncus effusus	Soft-rush	LC
Hyacinthoides hispanica	Spanish Bluebell	LC
Cirsium vulgare	Spear Thistle	LC
Euonymus europaeus	Spindle	LC
Crocus vernus	Spring Crocus	LC
Ornithogalum angustifolium	Star-of-Bethlehem	LC
Euphorbia helioscopia	Sun Spurge	LC
Castanea sativa	Sweet Chestnut	LC
Anthoxanthum odoratum	Sweet Vernal-grass	LC
Acer pseudoplatanus	Sycamore	LC
Allium triquetrum	Three-cornered Garlic	LC
Armeria maritima	Thrift	LC
Veronica serpyllifolia	Thyme-leaved Speedwell	LC
Phleum pratense	Timothy	LC
Juncus bufonius	Toad Rush	LC
Potentilla erecta	Tormentil	LC
Hypericum humifusum	Trailing St John's-wort	LC
Potentilla anglica	Trailing Tormentil	LC
Clematis vitalba	Traveller's-joy	LC
Rhododendron arboreum	Tree Rhododendron	LC

Scientific Name	Common Name	Status
Deschampsia cespitosa	Tufted Hair-grass	LC
Vicia cracca	Tufted Vetch	LC
Hypericum androsaemum	Tutsan	LC
Torilis japonica	Upright Hedge-parsley	LC
Agrostis canina	Velvet Bent	LC
Veronica arvensis	Wall Speedwell	LC
Mentha aquatica	Water Mint	LC
Cardamine flexuosa	Wavy Bitter-cress	LC
Deschampsia flexuosa	Wavy Hair-grass	LC
Reseda luteola	Weld	LC
Trifolium repens	White Clover	LC
Angelica sylvestris	Wild Angelica	LC
Daucus carota subsp. *carota*	Wild Carrot	LC
Daucus carota	Wild Carrot	LC
Prunus avium	Wild Cherry	LC
Fragaria vesca	Wild Strawberry	LC
Petasites fragrans	Winter Heliotrope	LC
Anemone nemorosa	Wood Anemone	LC
Geum urbanum	Wood Avens	LC
Melica uniflora	Wood Melick	LC
Milium effusum	Wood Millet	LC
Teucrium scorodonia	Wood Sage	LC
Veronica montana	Wood Speedwell	LC
Galium odoratum	Woodruff	LC
Carex sylvatica	Wood-sedge	LC
Oxalis acetosella	Wood-sorrel	LC
Ulmus glabra	Wych Elm	LC

Scientific Name	Common Name	Status
Achillea millefolium	Yarrow	LC
Iris pseudacorus	Yellow Iris	LC
Lysimachia nemorum	Yellow Pimpernel	LC
Rhinanthus minor	Yellow-rattle	LC
Holcus lanatus	Yorkshire-fog	LC

*Key; LC Least Concern'(NPWS.2016),

T28P (2km Grid Square) Botanical taxa recorded historically in this Grid Square (NBDC).

Common Name	Scientific Name	Conservation Status
Alder	*Alnus glutinosa*	LC
Ash	*Fraxinus excelsior*	LC
Aspen	*Populus tremula*	LC
Autumn Hawkbit	*Leontodon autumnalis*	LC
Barren Strawberry	*Potentilla sterilis*	LC
Beech	*Fagus sylvatica*	LC
Black Medick	*Medicago lupulina*	LC
Blackthorn	*Prunus spinosa*	LC
Bluebell	*Hyacinthoides non-scripta*	LC
Bramble	*Rubus fruticosus agg.*	LC
Broad-leaved Dock	*Rumex obtusifolius*	LC
Broad-leaved Helleborine	*Epipactis helleborine*	LC
Broom	*Cytisus scoparius*	LC
Bugle	*Ajuga reptans*	LC
Bulrush	*Typha latifolia*	LC
Bush Vetch	*Vicia sepium*	LC
Butterfly-bush	*Buddleja davidii*	Medium Impact Invasive Species
Cherry Laurel	*Prunus laurocerasus*	High Impact Invasive Species
Cleavers	*Galium aparine*	LC
Cock's-foot	*Dactylis glomerata*	LC
Coltsfoot	*Tussilago farfara*	LC
Common Bent	*Agrostis capillaris*	LC

Common Name	Scientific Name	Conservation Status
Common Bird's-foot-trefoil	*Lotus corniculatus*	LC
Common Centaury	*Centaurium erythraea*	LC
Common Chickweed	*Stellaria media*	LC
Common Couch	*Elytrigia repens*	LC
Common Dog-violet	*Viola riviniana*	LC
Common Figwort	*Scrophularia nodosa*	LC
Common Knapweed	*Centaurea nigra*	LC
Common Nettle	*Urtica dioica*	LC
Common Ragwort	*Senecio jacobaea*	LC
Common Sorrel	*Rumex acetosa*	LC
Common Spotted-orchid	*Dactylorhiza fuchsii*	LC
Compact Rush	*Juncus conglomeratus*	LC
Corsican Hellebore	*Helleborus argutifolius*	LC
Cowslip	*Primula veris*	LC
Crab Apple	*Malus sylvestris*	LC
Creeping Bent	*Agrostis stolonifera*	LC
Creeping Buttercup	*Ranunculus repens*	LC
Creeping Thistle	*Cirsium arvense*	LC
Crested Dog's-tail	*Cynosurus cristatus*	LC
Cuckooflower	*Cardamine pratensis*	LC
Curled Dock	*Rumex crispus*	LC
Dog-rose	*Rosa canina*	LC
Early Dog-violet	*Viola reichenbachiana*	LC

Common Name	Scientific Name	Conservation Status
Early-purple Orchid	*Orchis mascula*	LC
Elder	*Sambucus nigra*	LC
Enchanter's-nightshade	*Circaea lutetiana*	LC
English Stonecrop	*Sedum anglicum*	LC
False Oat-grass	*Arrhenatherum elatius*	LC
False-brome	*Brachypodium sylvaticum*	LC
Foxglove	*Digitalis purpurea*	LC
Germander Speedwell	*Veronica chamaedrys*	LC
Giant-rhubarb	*Gunnera tinctoria*	High Impact Invasive Species
Gorse	*Ulex europaeus*	LC
Great Willowherb	*Epilobium hirsutum*	LC
Greater Bird's-foot-trefoil	*Lotus pedunculatus*	LC
Greater Plantain	*Plantago major*	LC
Greater Stitchwort	*Stellaria holostea*	LC
Green Alkanet	*Pentaglottis sempervirens*	LC
Grey Alder	*Alnus incana*	LC
Ground-elder	*Aegopodium podagraria*	LC
Ground-ivy	*Glechoma hederacea*	LC
Guelder-rose	*Viburnum opulus*	LC
Guernsey Fleabane	*Conyza sumatrensis*	LC
Hard Rush	*Juncus inflexus*	LC
Hawthorn	*Crataegus monogyna*	LC
Hazel	*Corylus avellana*	LC

Common Name	Scientific Name	Conservation Status
Heath Speedwell	*Veronica officinalis*	LC
Hedge Bindweed	*Calystegia sepium*	LC
Hedge Woundwort	*Stachys sylvatica*	LC
Herb-Robert	*Geranium robertianum*	LC
Hoary Willowherb	*Epilobium parviflorum*	LC
Hogweed	*Heracleum sphondylium*	LC
Holly	*Ilex aquifolium*	LC
Honeysuckle	*Lonicera periclymenum*	LC
Horse-chestnut	*Aesculus hippocastanum*	LC
Italian Alder	*Alnus cordata*	LC
Ivy	*Hedera helix*	LC
Jointed Rush	*Juncus articulatus*	LC
Lesser Celandine	*Ranunculus ficaria*	LC
Lesser Hawkbit	*Leontodon saxatilis*	LC
Lesser Knotweed	*Persicaria campanulata*	LC
Lords-and-Ladies	*Arum maculatum*	LC
Marsh Cudweed	*Gnaphalium uliginosum*	LC
Marsh Thistle	*Cirsium palustre*	LC
Meadow Buttercup	*Ranunculus acris*	LC
Meadow Vetchling	*Lathyrus pratensis*	LC
Meadowsweet	*Filipendula ulmaria*	LC
Montbretia	*Crocosmia pottsii x aurea = C. x crocosmiiflora*	LC
Musk-mallow	*Malva moschata*	LC

Common Name	Scientific Name	Conservation Status
Navelwort	*Umbilicus rupestris*	LC
Nipplewort	*Lapsana communis*	LC
Opposite-leaved Golden-saxifrage	*Chrysosplenium oppositifolium*	LC
Oval Sedge	*Carex ovalis*	LC
Pedunculate Oak	*Quercus robur*	LC
Pencilled Crane's-bill	*Geranium versicolor*	LC
Pendulous Sedge	*Carex pendula*	LC
Perennial Rye-grass	*Lolium perenne*	LC
Petty Spurge	*Euphorbia peplus*	LC
Pignut	*Conopodium majus*	LC
Pineappleweed	*Matricaria discoidea*	LC
Prickly Sow-thistle	*Sonchus asper*	LC
Primrose	*Primula vulgaris*	LC
Ragged-Robin	*Lychnis flos-cuculi*	LC
Ramsons	*Allium ursinum*	LC
Red Bartsia	*Odontites vernus*	LC
Red Clover	*Trifolium pratense*	LC
Red Fescue	*Festuca rubra*	LC
Remote Sedge	*Carex remota*	LC
Rhododendron	*Rhododendron ponticum*	Invasive Species: Invasive Species
Ribwort Plantain	*Plantago lanceolata*	LC
Rosebay Willowherb	*Chamerion angustifolium*	LC

Common Name	Scientific Name	Conservation Status
Rowan	*Sorbus aucuparia*	LC
Rusty Willow	*Salix cinerea subsp. oleifolia*	LC
Sanicle	*Sanicula europaea*	LC
Scarlet Pimpernel	*Anagallis arvensis*	LC
Sea Mayweed	*Tripleurospermum maritimum*	LC
Selfheal	*Prunella vulgaris*	LC
Sharp-flowered Rush	*Juncus acutiflorus*	LC
Short-fruited Willowherb	*Epilobium obscurum*	LC
Silverweed	*Potentilla anserina*	LC
Slender St John's-wort	*Hypericum pulchrum*	LC
Smooth Sow-thistle	*Sonchus oleraceus*	LC
Snowberry	*Symphoricarpos albus*	LC
Soft-rush	*Juncus effusus*	LC
Spear Thistle	*Cirsium vulgare*	LC
Spindle	*Euonymus europaeus*	LC
Star-of-Bethlehem	*Ornithogalum angustifolium*	LC
Sun Spurge	*Euphorbia helioscopia*	LC
Sweet Vernal-grass	*Anthoxanthum odoratum*	LC
Sycamore	*Acer pseudoplatanus*	Medium Impact Invasive Species
Thyme-leaved Speedwell	*Veronica serpyllifolia*	LC
Timothy	*Phleum pratense*	LC
Toad Rush	*Juncus bufonius*	LC

Common Name	Scientific Name	Conservation Status
Trailing Tormentil	*Potentilla anglica*	LC
Tufted Hair-grass	*Deschampsia cespitosa*	LC
Tutsan	*Hypericum androsaemum*	LC
Upright Hedge-parsley	*Torilis japonica*	LC
Water Mint	*Mentha aquatica*	LC
Wavy Bitter-cress	*Cardamine flexuosa*	LC
Weld	*Reseda luteola*	LC
White Clover	*Trifolium repens*	LC
Wild Angelica	*Angelica sylvestris*	LC
Wild Carrot	*Daucus carota subsp. carota*	LC
Winter Heliotrope	*Petasites fragrans*	LC
Wood Anemone	*Anemone nemorosa*	LC
Wood Avens	*Geum urbanum*	LC
Wood Sage	*Teucrium scorodonia*	LC
Wood Speedwell	*Veronica montana*	LC
Wood-sedge	*Carex sylvatica*	LC
Wood-sorrel	*Oxalis acetosella*	LC
Wych Elm	*Ulmus glabra*	LC
Yarrow	*Achillea millefolium*	LC
Yellow Pimpernel	*Lysimachia nemorum*	LC
Yellow-rattle	*Rhinanthus minor*	LC
Yorkshire-fog	*Holcus lanatus*	LC

Please note; All recorded species, hybrids or subspecies of flora are listed as Least Concern'(NPWS. 2016).

T28T (2km Grid Square) Botanical taxa recorded historically in this Grid Square (NBDC).

Common Name	Scientific Name	Conservation Status
Alder	*Alnus glutinosa*	LC
Ash	*Fraxinus excelsior*	LC
Barren Strawberry	*Potentilla sterilis*	LC
Beech	*Fagus sylvatica*	LC
Bluebell	*Hyacinthoides non-scripta*	LC
Bramble	*Rubus fruticosus agg.*	LC
Broad-leaved Willowherb	*Epilobium montanum*	LC
Bulrush	*Typha latifolia*	LC
Cleavers	*Galium aparine*	LC
Common Chickweed	*Stellaria media*	LC
Common Figwort	*Scrophularia nodosa*	LC
Common Nettle	*Urtica dioica*	LC
Common Ragwort	*Senecio jacobaea*	LC
Creeping Bent	*Agrostis stolonifera*	LC
Creeping Buttercup	*Ranunculus repens*	LC
Downy Birch	*Betula pubescens*	LC
Early Dog-violet	*Viola reichenbachiana*	LC
Elder	*Sambucus nigra*	LC
Enchanter's-nightshade	*Circaea lutetiana*	LC
False-brome	*Brachypodium sylvaticum*	LC
Foxglove	*Digitalis purpurea*	LC

Common Name	Scientific Name	Conservation Status
Goat Willow	*Salix caprea*	LC
Gorse	*Ulex europaeus*	LC
Greater Stitchwort	*Stellaria holostea*	LC
Ground-ivy	*Glechoma hederacea*	LC
Hawthorn	*Crataegus monogyna*	LC
Hazel	*Corylus avellana*	LC
Hedge Mustard	*Sisymbrium officinale*	LC
Hedge Woundwort	*Stachys sylvatica*	LC
Hemlock Water-dropwort	*Oenanthe crocata*	LC
Herb-Robert	*Geranium robertianum*	LC
Hogweed	*Heracleum sphondylium*	LC
Holly	*Ilex aquifolium*	LC
Honeysuckle	*Lonicera periclymenum*	LC
Ivy	*Hedera helix*	LC
Lesser Celandine	*Ranunculus ficaria*	LC
Lords-and-Ladies	*Arum maculatum*	LC
Meadowsweet	*Filipendula ulmaria*	LC
Nipplewort	*Lapsana communis*	LC
Pedunculate Oak	*Quercus robur*	LC
Pignut	*Conopodium majus*	LC
Primrose	*Primula vulgaris*	LC
Red Clover	*Trifolium pratense*	LC

Common Name	Scientific Name	Conservation Status
Remote Sedge	*Carex remota*	LC
Rowan	*Sorbus aucuparia*	LC
Wood Dock	*Rumex sanguineus*	LC
Grey Willow	*Salix cinerea*	LC
Sanicle	*Sanicula europaea*	LC
Sessile Oak	*Quercus petraea*	LC
Dandelion	*Taraxacum aggregate*	LC
Wild Angelica	*Angelica sylvestris*	LC
Wood Avens	*Geum urbanum*	LC
Wood Sage	*Teucrium scorodonia*	LC
Wood Speedwell	*Veronica montana*	LC
Wood-sedge	*Carex sylvatica*	LC
Wood-sorrel	*Oxalis acetosella*	LC
Yellow Pimpernel	*Lysimachia nemorum*	LC
Yorkshire-fog	*Holcus lanatus*	LC

Please note; All recorded species, hybrids or subspecies of flora are listed as Least Concern'(NPWS. 2016).

APPENDIX 5-C
Photographic record of Broad-leaved hellorborine

Plate	
Plates 1 – 3: Location 1 (see Figure 2) where six broad-leaved helleborines were found growing out of a gravel substrate	 

Plate 4: Location 2 – three broad-leaved helleborine growing beneath lime *Tilia* sp. canopy in ivy field layer

Plate 5 & 6: single broad-leaved helleborine at location 3 (northern verge) which has been recently cut

Plate 7: Location 4 – single broad-leaved helleborine (in small section of uncut verge) immediately south of location 3 in southern verge

Plate 8: Location 6 – population of nine broad-leaved helleborines identified behind entrance wall to the east of the gate in gravelly substrate along the edge of a woodland in recently cut vegetation

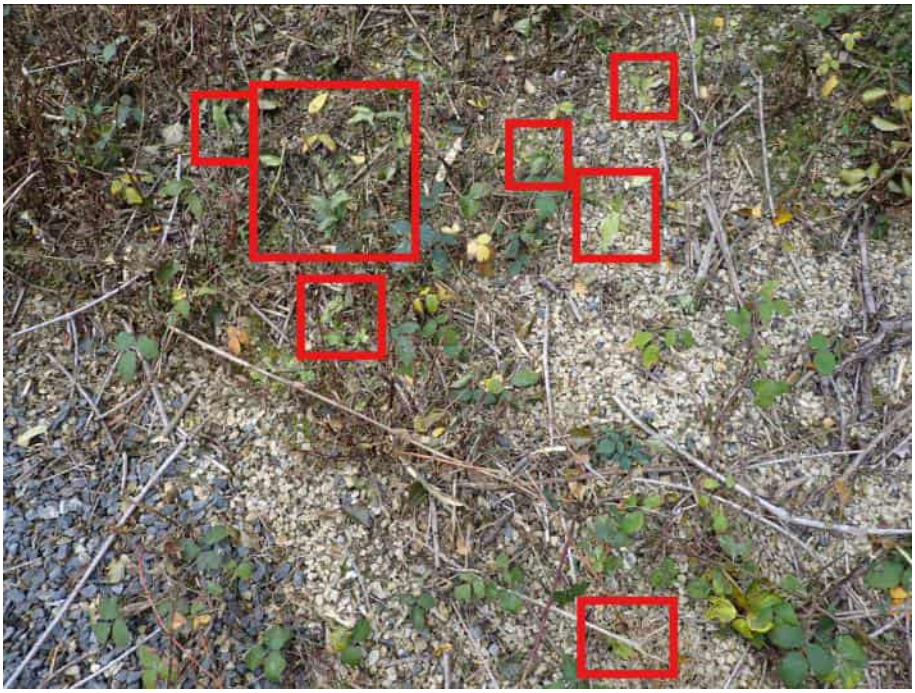


Plate 9: Location 7 – single plant south of road by gate entrance to land parcel

Plate 10: Location 8 – single plant identified on southern side of road.	

APPENDIX 5-D
Invasive Species Management Plan

INTRODUCTION

Ecology Ireland Wildlife Consultants Ltd. (Ecology Ireland) was commissioned to prepare a preliminary Invasive Species Management Plan (ISMP) to accompany the EIAR and planning application for the development of an Inert Landfill and C&D Waste Recovery Facility at the former Ballinclare Quarry.

Field surveys recorded the presence of a number of Third Schedule Invasive Plant species on-site and along the L1157 as well as other less damaging invasive species.

The location of the aforementioned invasive species was recorded and a preliminary site-specific Invasive Species Management Plan, which aims to provide an outline of the most appropriate or 'best practice' methodologies available to successfully achieve the permanent eradication of these invasive species from within the proposed development site.

This preliminary management plan was completed with reference to current guidelines available in relation to specific species profiles (after NRA 2010, Higgins 2008, Barron undated and Fennell *et al.* 2018). The Management Plan will be finalised during consultation with and based on the advice of the appointed specialist contractor, who will continue to review and, if necessary, update the Management Plan in order to ensure that current relevant guidelines and regulations are followed at the time when the management of these species is implemented.

The main objectives of this study were to:

- Based on the information collected during the field assessment provide a map/drawing showing the location of the invasive/non-native species recorded.
- Review current best practice guidance for control/eradication in relation to specific species profiles.
- To provide a preliminary invasive species management plan, outlining the most appropriate methods currently available to eradicate these invasive/non-native species.

This ISMP is separate from the strict soil acceptance criteria which are described in the EIAR and designed to minimise the risk of importation and spread of invasive plant species originating from external sources.

Proposed Development Site

Two species listed on the Third Schedule, under regulations 49 & 50, of the 2011 European Communities (Birds and Natural Habitats) Regulations (*i.e.* species of which it is an offense to disperse, spread or otherwise cause to grow in any place) were recorded during the field surveys. A patch of Rhododendron (*Rhododendron ponticum*) was recorded in the southwestern corner of the site and Giant Rhubarb (*Gunnera tinctoria*) was located along the margin of the L1157 a short distance west of the M11 (Figure 1).

This Figure also shows the location of a number of other non-Third Schedule species. There is no legal requirement to control the spread of these species. However, as part of the EIAR commitments, Cherry Laurel (*Prunus laurocerasus*) infestation of the high conservation value Oak-Holly-Birch woodland will be controlled.

Vector materials, such as soil and/or spoil taken from infested sites are also included under Regulations 49 & 50 for Third Schedule species.

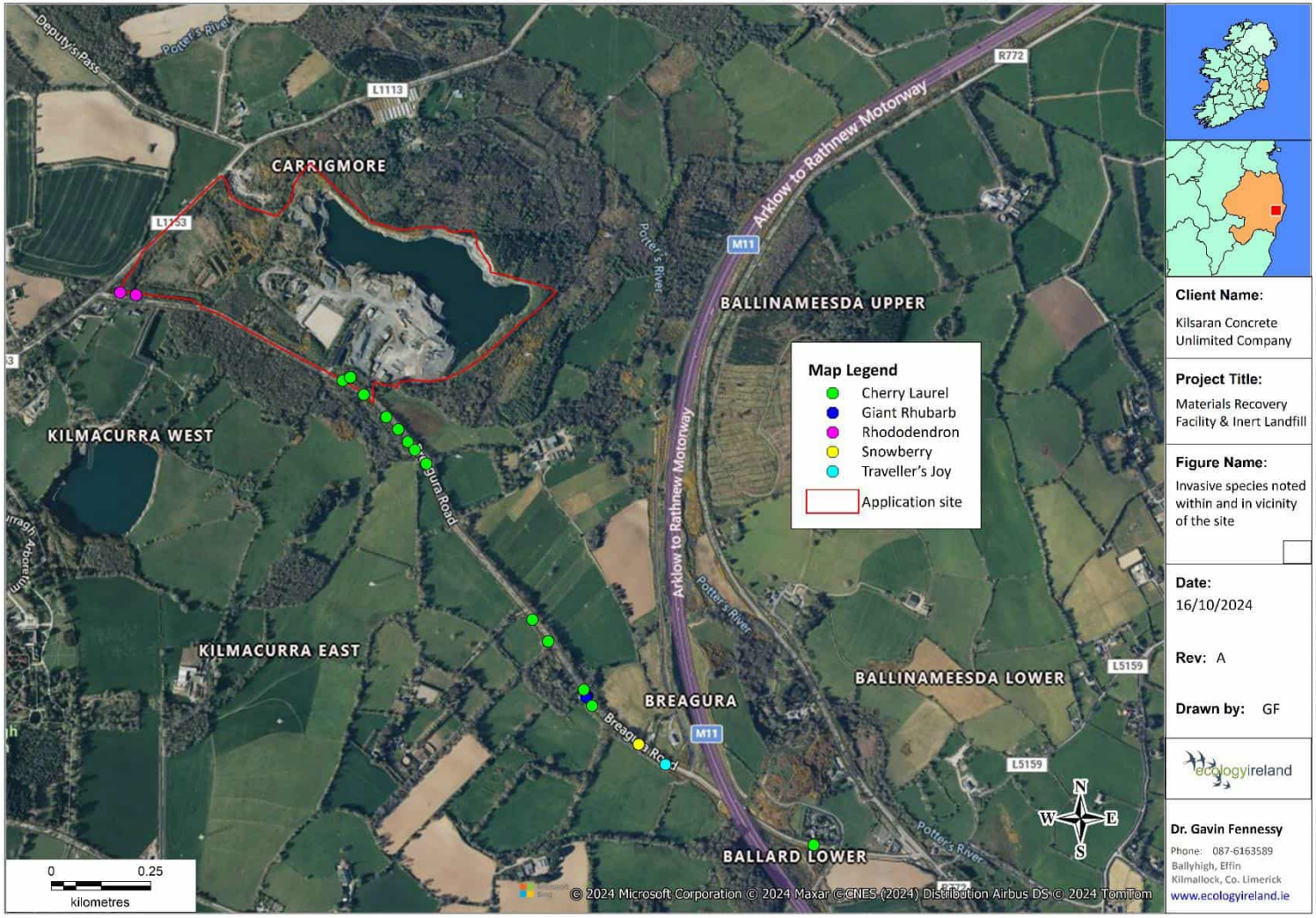


Figure 1. Invasive species recorded within and in the vicinity of the site.

Field Surveys

Field surveys are described in Chapter 5 of the EIAR. Field surveys also recorded a number of other lesser invasive species including Butterfly Bush, *Buddleja davidii* which was widespread within the application site and Snowberry, *Symphoricarpos albus* and Traveller's Joy, *Clematis vitalba* which were noted along the L1157.

Two Third Schedule Invasive plant species were recorded: Rhododendron (Plate 1) and Giant Rhubarb (Plate 2). The locations of these species is shown in Figure 1 above and presented in Table 1 below.

Plate 1
***Rhododendron ponticum* at the southwest of the site.**

Plate 2
***Gunnera tinctoria* (Giant Rhubarb).**

Table 1
Locations noted of invasive plant species.

Name	Species Name	X (ITM)	Y (ITM)	Third Schedule (Y/N)?
Giant Rhubarb	*Gunnera tinctoria*	725920	687955	Y
Giant Rhubarb	*Gunnera tinctoria*	725918	687953	Y
Rhododendron	*Rhododendron ponticum*	724716	688941	Y
Rhododendron	*Rhododendron ponticum*	724756	688936	Y
Cherry Laurel	*Prunus laurocerasus*	725326	688741	N
Cherry Laurel	*Prunus laurocerasus*	725451	688584	N
Cherry Laurel	*Prunus laurocerasus*	725426	688615	N
Cherry Laurel	*Prunus laurocerasus*	725395	688645	N
Cherry Laurel	*Prunus laurocerasus*	725337	688700	N
Cherry Laurel	*Prunus laurocerasus*	725283	688734	N
Cherry Laurel	*Prunus laurocerasus*	725911	687972	N
Cherry Laurel	*Prunus laurocerasus*	725818	688091	N
Cherry Laurel	*Prunus laurocerasus*	725777	688145	N
Cherry Laurel	*Prunus laurocerasus*	725499	688530	N
Cherry Laurel	*Prunus laurocerasus*	725469	688564	N
Cherry Laurel	*Prunus laurocerasus*	726501	687596	N
Cherry Laurel	*Prunus laurocerasus*	725933	687932	N
Snowberry	*Symphoricarpos albus*	726053	687838	N
Traveller's Joy	*Clematis vitalba*	726122	687789	N

The current management guidelines available for each of the non-native species was subsequently reviewed to allow for species-specific management measures to be recommended.

The primary management guidelines reviewed to inform this report include;

- Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (National Roads Authority NRA, 2010)
- Practical Management of Invasive Non-Native Weeds in Britain and Ireland. Property Care Association (PCA, 2018). Compiled by Mark Fennell, Laura Jones and Max Wade. Packard Publishing Limited.
- The Control of Rhododendron in Native Woodlands. Chris Barron (undated). The Forest Service. Native Woodland Scheme Information Note No. 3.
- R*hododendron ponticum*: A guide to management on nature conservation sites. G.T. Higgins (2008). Irish Wildlife Manuals, No. 33. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

Eradication of Invasive Species.

The best available methods of control and eradication were compiled with reference to the Guidelines listed and are summarised in this section of the report. It is recommended that a suitably experienced contractor is employed to undertake the invasive species eradication programme at the site. Methods of invasive species control are rapidly evolving, based on new research and the availability and use of dedicated chemical agents. It is important in the preparation of any invasive species management plan to highlight the need for the plan to be reviewed and adapted in the context of any changes that occur in guidance or legislation in the period between pre-planning surveys and the implementation of controls.

The approved contractor will finalise this management plan, based on contemporary experience and knowledge, and on the prevailing level of infestation of each invasive species. A pre-treatment survey will be carried out to ground-truth the extent of each invasive species and to confirm that the recommended approach herein remains appropriate. For example, manual control may work well for small, new infestations, but a combination of manual and chemical control may be required to ensure the complete eradication of more established shrubs. The specialist contractor will advise/finalise the best approach based on their knowledge of the species in question.

The successful eradication of invasive species from the development site may require some discussion and co-operation with neighbouring landholdings/landowners and as such the management plan will be discussed and (if possible) agreed with any relevant parties. It is only possible to commit to control of species within lands under the control of the applicant. It is intended that any works along the public road will take due care to ensure that there will be no spreading of any Third Schedule species. In consultation with the local authority, Third Schedule species present along the L1157 and at risk of spread from the road works, will be controlled/eradicated. At present there are two areas with Giant Rhubarb along the L1157 which may need to be treated.

Management Options for Control/Eradication of Rhododendron

As described in Section 1, *Rhododendeon ponticum* is an invasive plant species recorded for the study site that is listed on the Third Schedule of the 2011 European Communities (Birds and Natural Habitats) Regulations (*i.e.* species of which it is an offense to disperse, spread or otherwise cause to grow in any place). Vector materials; soil and/or spoil taken from infested sites are also included under Regulations 49 & 50 for this species.

Rhododendron in Ireland hosts a serious plant health pathogen *Phytophthora ramorum*. This is a fungus that has the potential to attack a wide variety of native woody plants and is the causative agent of ‘Sudden Oak Death’.

The developer will ensure through their appointed contractor that the Invasive Species Management plan is reviewed by suitably qualified and experienced specialist contractors ahead of any site mobilisation. Due to the high risk posed by this species, the location of Rhododendron stands will be clearly marked and cordoned off ahead of any site works. The location and sensitivity of these locations will be covered in the initial induction with all site staff prior to construction works. All site staff will be made aware of the existence of this Management Plan and where it will be available for review on-site.

The invasive species management contractor employed to undertake Rhododendron eradication will review and if necessary, update/amend the suggested management provided in this report. They will have responsibility for ensuring that the adopted approach follows the best contemporary guidance and is fully legally compliant.

Rhododendron Worksheet/Site Specific Management Record Form:

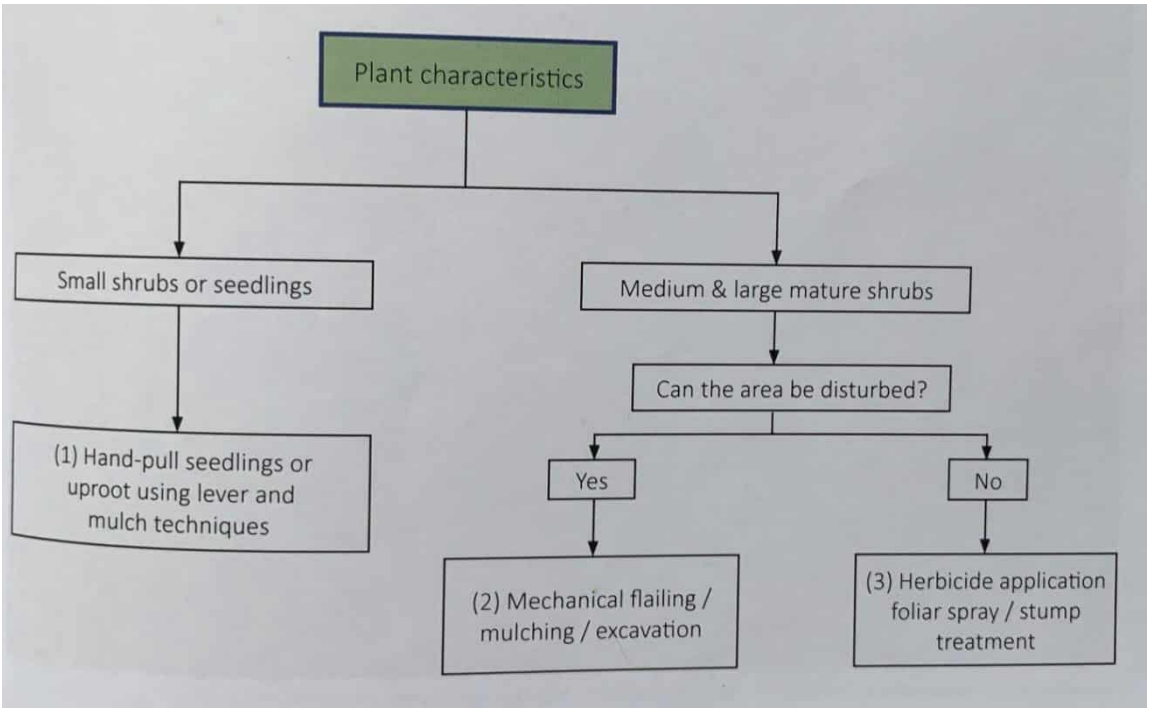
Management/Eradication options for *Rhododendron ponticum* (after NRA 2010, Fennell *et al.* 2018) to include;

Management Options for Japanese Knotweed (TBC by Approved Contractor) to Include:		
Initial Site Staff Induction	An initial induction with all site staff will be undertaken prior to construction works starting, to inform them of the occurrence on site of *Rhododendron ponticum*, including issues caused by its spread, identification and site walkover of known locations (Table 1 and Figure 1) – ensuring clearing of footwear, equipment etc. prior to leaving infested area – *i.e.* **PLAN, CHECK, CLEAN & DRY** (Fennell *et al.* 2018) All site staff will be made aware of the existence of the Management Plan and where it will be available for review as required, the proposed management options appropriate for the site, and the name of the contractor appointed for invasive species management and removal where applicable.	
Rhododendron - Brief Description	Rhododendron is an evergreen shrub often reaching 4-5m at maturity. The shrub has light brown, woody stems and elliptical, glossy dark green leaves. Early summer lilac pink or purple flowers emerge produce seed pods which mature over the summer months, dispersing thousands of seeds in late winter. It is relatively shallow-rooted. It spreads rapidly and forms dense cover often shading out the understorey of woodland and reducing biodiversity.	
Pathways of spread	Primarily reproduces and spreads by seeds distributed by wind, water, animals and topsoil (NRA 2010, Fennell *et al.* 2018). Regeneration can also result from small rhizome fragments and stem layering.	
Prevention	**Immediate action**: Remove young plants – reaches seeding age at 10-12 years	
Note:	It is a requirement of this plan that only personnel with sufficient training, experience and knowledge in the control of non-native invasive species should be employed to assist in the planning and implementation of control measures in relation to Rhododendeon which should be undertaken with reference to the current guidance. **The primary objective of control should be removal and follow up control to work towards eradication** **Any removal from site must be in line with current waste regulations.** For more information on determining the best approach to take see Fennell *et al.* 2018.	
	Personnel Responsible: TBC on appointment of contractor	**Date to Undertake:** TBC on appointment of contractor
Approved methodologies to be implemented for this site (to be reviewed and if necessary, amended by approved specialist contractor)**:**	**Methods to be Undertaken:** TBC on appointment of contractor with reference to 1 to 6 below and in line with most current guidelines and regulations). At present **our recommended approach** favours a combination of Methods 1-3 for this site.	**Date to be Undertaken:** TBC on appointment of contractor – specialist invasive species management specialists to have reviewed and finalised management measures and any necessary work (e.g. pre-works survey and isolation of areas with invasive plants) carried out ahead of any other site mobilisation.

Methodologies Available for Consideration in Finalising Eradication Programme:		
1. Hand Excavation: Hand pulling. uprooting	**Advantages:** Recently germinated seedlings can easily be hand-pulled. Small bushes can be uprooted using a lever and mulch technique/	**Disadvantages:** Labour-intensive, does not remove any seed bank present, may not work well with mature specimens
2. Physical cutting: flailing/mulching/excavation	**Advantages**: Highly effective of carried out in conjunction with specialised herbicide treatment to stumps and regrowth. Works can cover larger areas of infestation and in the growing season.	**Disadvantages:** Expensive, specialist work. Arisings need to be disposed of appropriately, mulched roots can regrow.
3 Herbicide application	**Advantages:** Cost effective. Foliar spray appropriate for seedlings and small or cut shrubs. Stem treatment effective for larger specimens. Cut stump treatment is less potentially damaging to non-target species.	**Disadvantages:** Care needs to be taken on use of chemicals that could be damaging to non-target species.

Given that the current infestation is localised, mechanical measures may be sufficient in controlling and eradicating the Rhododendron on site. The specialist contractor will advise on the most appropriate treatment and aftercare programme based on the pre-works survey results. Plate 3 summarises the current management advice for this Third Schedule species.

Plate 3
Flow-chart with management advice (from Fennell *et al*. 2018).



Management Options for Control / Eradication of Gunnera

Giant Rhubarb was recorded at two locations along the margin of L1157. If the proposed road widening and strengthening works risk the spread of Gunnera, a control/eradication programme will be discussed and agreed with the local authority.

Gunnera Worksheet / Site Specific Management Record Form:

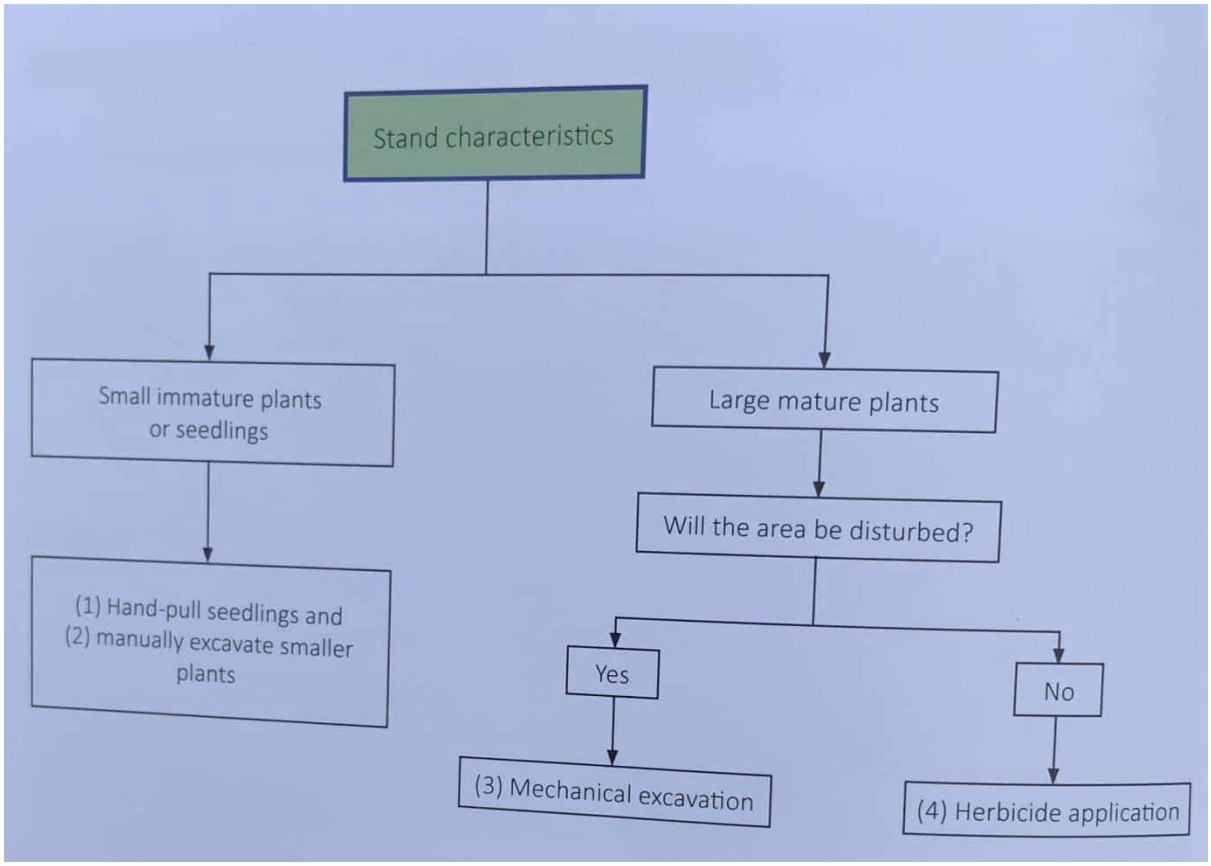
Management options for Gunnera (after NRA 2010, Fennell *et al.* 2018) to include;

Management Options for Buddleia, to Include (TBC by Approved Contractor):	
Initial Site Staff Induction	An initial induction with all site staff will be undertaken prior to construction works starting, to inform them about Giant Rhubarb, including issues caused by its spread, identification and site walkover of known locations – ensuring clearing of footwear, equipment etc. prior to leaving infested area. The existence of this Management Plan and where it will be available for review as required, the proposed management options appropriate for here, and the name of the contractor appointed for invasive species management and removal where applicable.
Gunnera Description	Huge, clump forming long-lived perennial herb. Grows over 2m tall. Creates extensive rhizome network. Suppresses the growth of native plants by creating shade from the giant umbelliform leaves.
Pathways of spread	Seed; (> 250,000 per plant) are primarily distributed by water, birds and in topsoil; also by small rhizome fragments.
Prevention	Immediate action: **Plan, Check, Clean and Dry** - Always clean footwear, clothing and equipment immediately on leaving the infested area. If total removal not possible, seed head removal prior to maturation is useful. Control newly established plants as soon as possible. More difficult to control and eradicate once established.
Types of control available (to be completed TBC by approved contractor)	The methodology used may depend on maturity of plants. Where young shrubs are involved, if it is a small infestation, actions 1 or 3 are most suitable. For a larger infestation/ more mature shrubs a herbicide treatment may be appropriate (action 4.). In the event plants are deemed mature if it is a large stand then action 3 mechanical action may be most suitable, while in the event of smaller stand of mature shrubs action 1 and 2 – hand pulling and excavation using hand tools may be the most appropriate option (see Fennell *et al* 2018) for more detail on choosing best approach.
Type of control to be undertaken at this site:	(TBC by approved contractor *i.e.* 1, 2, 3 or 4 or/and a combination of control methods as presented below)

	Personnel Responsible: TBC on appointment of contractor		**Date to Undertake:** TBC on appointment of contractor. Management Plan needs to be reviewed and if necessary, amended by a suitably qualified specialist contractor ahead of site mobilisation.	
1. Hand Pulling	**Advantages:** Small plants are easily hand-pulled, particularly in damp soil		**Disadvantages:** Labour intensive. Plants need to be disposed of appropriately.	
2. Excavation (hand-tools)	**Advantages**: Suitable for smaller plants. Rhizomes tend to be close to the surface, with primarily horizontal spread.		**Disadvantages**: Only suitable for minor infestations and at the early stages of colonisation. Can regrow from small fragments. Repeat visits likely to be needed as seed bank removal is very difficult.	
3. Excavation (mechanical)	**Advantages:** Suitable for larger stands.		**Disadvantages:** Expensive. Need to dispose of removed shrubs appropriately. Repeat visits likely to be needed as seed bank removal is very difficult.	
4. Herbicide application	Cost effective and effective at suppressing vigorous growth.		Total control is problematic. Monitoring and retreatment likely to be required. **NOTE: it is an offence to use Plant Protection Products in a manner other than specified on the label and in accordance with the product label and with Good Plant Protection Practice as prescribed in the EU - (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003).**	
Ongoing Monitoring and Evaluation **Of success of eradication programme**	**Personnel Responsible:** TBC on appointment of contractor	**Dates to be undertaken by:** TBC on appointment of contractor	**Reporting To:** TBC on appointment of contractor	**Status/Are Additional Treatments Required (if so give dates):** TBC on appointment of contractor

The preferred approach will be avoidance of interference with any Giant Rhubarb present. However, if this is not possible the specialist contractor will advise on the most appropriate treatment and aftercare programme based on the pre-works survey results. Plate 4 summarises the current management advice for this Third Schedule species.

Plate 4
Flow-chart with management advice (from Fennell *et al*. 2018).



Management Options for Control / Eradication of Cherry Laurel

Like Rhododendron, the leaves of Cherry Laurel are thick glossy and evergreen. It can form a dense and shady understorey and outcompetes other plant species. The leaves are thick and laurel-like and toxic to animals. The plant produces small white flowers on upright spikes which are succeeded in autumn by blackish cherry-like fruits which should not be eaten.

A similar methodology for the control of Rhododendron can be applied in the control and eradication of Cherry Laurel.

1. Cut and remove stems by hand or chainsaw, cutting as close to the ground as possible to remove above ground growth. Chip or remove the cut material from the area to allow for effective follow-up work and prevent regrowth.
2. Flailing has also been effectively used in Ireland to treat young or immature growth.
3. There are four recommended methods to achieve successful management after the initial cut and removal:
    a. Digging the stumps out. The effectiveness of this technique is increased by removing all viable roots. This can be done manually or with a tractor and plough. To avoid regrowth, stumps should be turned upside down and soil should be brushed off roots.
    b. Direct stump treatment by painting or spot spraying freshly cut low stumps with a herbicide immediately after been cut. The herbicide concentrations used and timings of applications vary according to which chemical is used. Use of a vegetable dye is recommended to mark treated stumps and all stumps should be targeted. A handheld applicator will help avoid spray drift onto surrounding non-target species. Always read the label and follow the manufacturers guidelines when using herbicides.
    c. A variation on the stump treatment method is stem injection, using a ‘drill and drop’ methodology, whereby, if the main stem is cut and is large enough for a hole to be drilled into it, the hole can be used to facilitate the targeted application of herbicide.
    d. Stump regrowth and seedlings can be effectively killed by spraying regrowth with a suitable herbicide. Best practice spraying protocols should be carefully followed.

The areas to be targeted will be informed by a pre-work survey and mapping of the extent of the Cherry Laurel present. Addressing the infestation of high-value Oak-Holly-Birch woodland (WN1) will be the immediate priority.

Review of Proposed Invasive Species Management Approach

All management measures proposed by the specialist contractor will be presented and approved in writing by the local authority in advance of the construction phase. A suitably qualified ecologist will be appointed to prepare a post-treatment report within three-years of initial treatments prescribed in the management plan and this report will be submitted for the attention of the planning authority and NPWS.

CONCLUSION

This preliminary management plan was completed based on the recording of two Third Schedule species during field surveys for the proposed development. In addition, the Biodiversity Chapter of the EIAR (Chapter 5) recognised the need to control the spread of Cherry Laurel in an area of high conservation value WN1 woodland. Based on the information collected in the field and on review of available management guidelines, preliminary species-specific guidance has been produced for each of the three species: *Rhododendron ponticum*, *Gunnera tinctoria* and in targeted areas, Cherry Laurel.

While this report presents the best available methodologies for eradication and control of each species, the final programme of works for control/eradication will be detailed and finalised in consultation with and based on advice provided by the appointed specialist contractor, who will review, and if necessary, amend the Management Plan, in order to ensure that the approach taken is in keeping with the best contemporary guidelines and regulations.

A suitably qualified ecologist will be appointed to ground-truth and update the mapped extent of the invasive species ahead of any site works. In addition, the invasive species management contractor will be responsible for marking areas/plants to be treated in an appropriate fashion. The invasive species management plan will be communicated to all staff as part of the site induction. Where Third Schedule invasive species occur on shared boundaries or in areas directly adjoining the works footprint an effort will be made to eradicate these plants with the agreement of the relevant landowners.

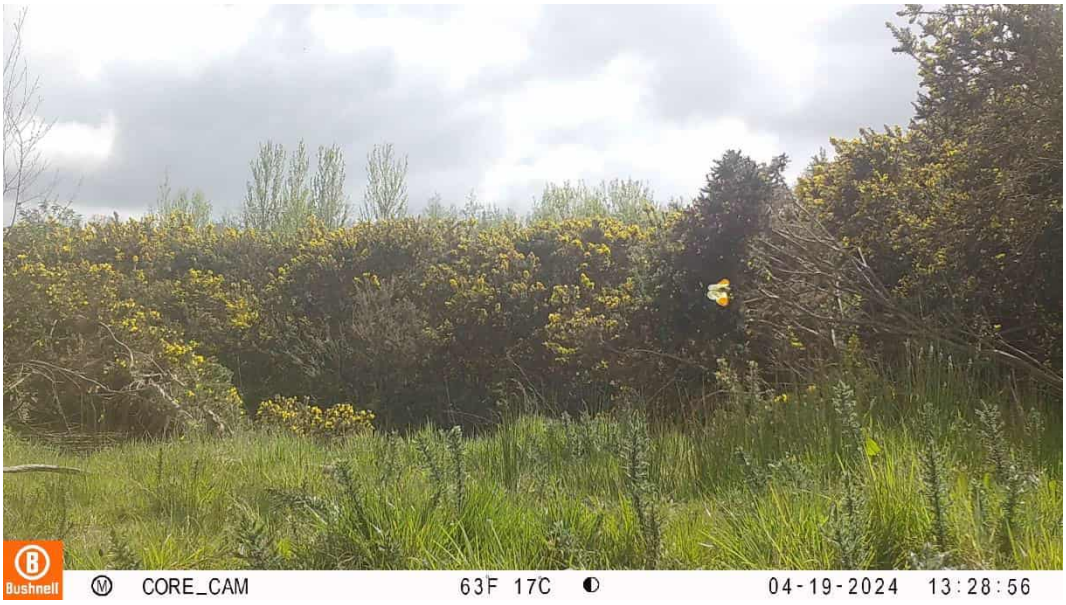
An independent ecologist will be appointed to review the implementation of the plan in Year 1 and 3 following initiation of the invasive species management at the site. A report will be prepared and submitted for the attention of the planning authority and NPWS.

REFERENCES

NRA (National Roads Authority). Revision 1, 2010. The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads.

Mark Fennell, Laura Jones and Max Wade. 2018. Practical Management of Invasive Non-Native Weeds in Britain and Ireland. Property Care Association PCA. Packard Publishing Limited.

APPENDIX 5-E
Sample of Trail Camera Images

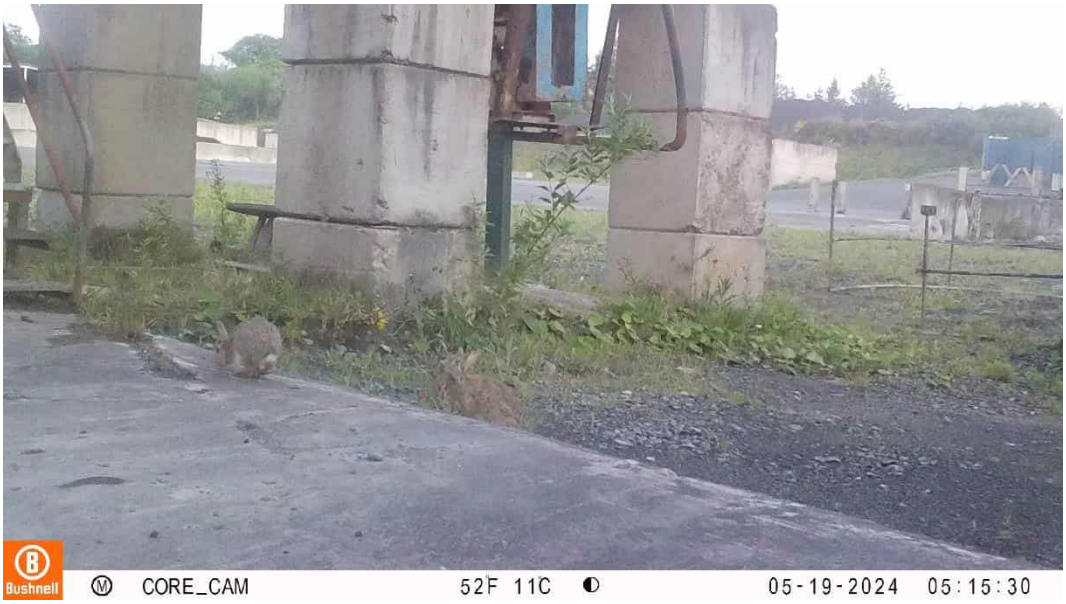


Orange-tip Butterfly

Fox during daytime

Fox was one of most commonly recorded non-volant mammal species.

Sika Deer were regularly recorded day and night with adults and young present.



Rabbits were locally common at the site.

Pine Marten was recorded at several camera locations.

Badgers were only recorded singly on the trail camera record.

Badgers were most frequently recorded in woodland and at woodland edge.

The trail camera record was dominated by Sika Deer and…

Fox.

The trail cameras also recorded avian species including Jay.

Redwing were recorded at the site in mid-March 2024.

Sika Deer were widespread at the site.

Occasionally very young Sika Deer were observed.

Grey Heron was a species recorded foraging at the settlement ponds.

Mallards were also present.

Brown Rat was recorded at only a couple of the camera trap locations.

Pine Marten was infrequently recorded on the cameras but this is not unusual for arboreal species.

The trail cameras recorded some of the less common bird species present at the site including Bullfinch and…

Yellowhammer.

APPENDIX 5-F
Biological Water Quality Results and Macro-Invertebrate Sweep Sampling Results for Lacustrine Sites

Macro-invertebrate Q-sampling Results for Riverine Sites, July 2024

	Family	Species	A1	A2	B1	B2	C1	C2	EPA class
Ephemeroptera	Heptageniidae	*Ecdyonurus insignis*	1						**A**
Ephemeroptera	Heptageniidae	*Rhithrogena semicolorata*		3					**A**
Plecoptera	Chloroperlidae	*Siphonoperla torrentium*	1	1					**A**
Plecoptera	Nemouridae	*Nemurella picteti*			5				**A**
Ephemeroptera	Baetidae	*Alainites muticus*	1	1					**B**
Ephemeroptera	Baetidae	*Cloeon simile*							**B**
Plecoptera	Leuctridae	*Leuctra fusca*	16	10					**B**
Trichoptera	Limnephilidae	*Halesus radiatus*						2	**B**
Trichoptera	Limnephilidae	*Potamophylax cingulatus*	3				6	1	**B**
Trichoptera	Odontoceridae	*Odontocerum albicorne*		1					**B**
Trichoptera	Sericostomatidae	*Sericostoma personatum*		1					**B**
Ephemeroptera	Baetidae	*Baetis rhodani*	16	9			3	2	**C**
Ephemeroptera	Ephemerellidae	*Serratella ignita*	20	8					**C**
Trichoptera	Philopotamidae	*Philopotamus montanus*		1					**C**
Trichoptera	Polycentropodidae	*Plectrocnemia conspersa*			1				**C**

	Family	Species	A1	A2	B1	B2	C1	C2	EPA class
Trichoptera	Rhyacophilidae	*Rhyacophila dorsalis*		5					**C**
Crustacea	Gammaridae	*Gammarus duebeni*	8	8	14	2	5	2	**C**
Mollusca	Tateidae	*Potamopyrgus antipodarum*	1		8	65	5	5	**C**
Coleoptera	Dytiscidae	Dytiscidae larva	3		1	1			**C**
Coleoptera	Dytiscidae	*Oreodytes sanmarkii*	6	1					**C**
Coleoptera	Elmidae	*Limnius volckmari*		2					**C**
Coleoptera	Hydraenidae	*Hydraena gracilis*	1	2					**C**
Coleoptera	Scirtidae	Scirtidae larva			1				**C**
Diptera	Chironomidae	Non-*Chironomus* spp.	3	6	2		1	3	**C**
Diptera	Culicidae	sp. indet.							**C**
Diptera	Pediciidae	*Dicranota* sp.	5	6			3	3	**C**
Diptera	Ptychopteridae	sp. indet.			3				**C**
Diptera	Simuliidae	sp. indet.	1	4	5			3	**C**
Diptera	Thaumaleidea	sp. indet.		1					**C**
Arachnida	Hydrachnidiae	sp. indet.	2					1	**C**
Crustacea	Asellidae	*Asellus aquaticus*				30			**D**
Crustacea	Crangonyctidae	*Crangonyx* sp.				9			**D**
Hirudinidae	Glossiphoniidae	*Glossiphonia complanata*			1	1	1		**D**

	Family	Species	A1	A2	B1	B2	C1	C2	EPA class
Gastropoda	Physidae	*Aplexa hypnorum*[1]				2			**D**
Mollusca	Sphaeriidae	sp. indet.			2				**D**
Diptera	Chironomidae	*Chironomus* spp.	4				1		**E**
Annelidae	Oligochaeta	sp. indet.	1		1		2		**n/a**
Abundance			**80**	**230**	**191**	**96**	**101**	**121**	
Q-rating			Q4	Q3-4	Q4	Q3-4	Q4	Q4	
WFD status			Good	Mod	Good	Mod	Good	Good	

[1] Listed as vulnerable in Ireland (Byrne *et al*., 2009)

Macro-invertebrate Sweep Sampling Results for Lacustrine Sites L1 and P1-P5, July 2024

Group	Family	Species	L1	P1	P2	P3	P4	P5
Mollusca	Lymnaeidae	*Ampullacaena balthica*	83	18	3	1	25	4
Ephemeroptera	Baetidae	*Cloeon simile*	80			2	2	3
Mollusca	Tateidae	*Potamopyrgus antipodarum*	67					1
Hemiptera	Corixidae	Corixidae nymph	20					
Mollusca	Lymnaeidae	*Lymnaea stagnalis*	16					
Hemiptera	Corixidae	*Corixa affinis*	5					
Diptera	Culicidae	sp. indet.	3		1	2		
Hemiptera	Corixidae	*Siagara distincta*	3					
Coleoptera	Dytiscidae	Dytiscidae larva	1					
Coleoptera	Halipliidae	*Haliplus confinis*	1	2			1	1
Diptera	Chironomidae	Non-*Chironomus* spp.	1	8	4	3	5	3
Arachnida	Hydrachnidiae	sp. indet.		5	1			
Coleoptera	Dytiscidae	*Dytiscus dimidiatus*		1		2		
Coleoptera	Dytiscidae	*Hydroporus angustatus*		2		1		
Coleoptera	Dytiscidae	*Hygrotus inaequalis*				1		
Coleoptera	Dytiscidae	*Hyphydrus ovatus*						3
Coleoptera	Dytiscidae	*Ilybius ater*				3		
Coleoptera	Dytiscidae	*Ilybius fuliginosus*				1		
Coleoptera	Gyrinidae	*Gyrinus substriatus*		3		1		
Coleoptera	Halipliidae	*Haliplus lineatocollis*						1

Group	Family	Species	L1	P1	P2	P3	P4	P5
Coleoptera	Hydrophilidae	*Helophorus brevipalpis*			1		1	1
Diptera	Chaoboridae	sp. indet.		1		1		
Diptera	Chironomidae	*Chironomus* spp.		6	1			1
Diptera	Dixidae	sp. indet.			1			
Ephemeroptera	Baetidae	*Alainites muticus*					1	
Ephemeroptera	Ephemerellidae	*Serratella ignita*			1			
Hemiptera	Corixidae	*Hesperocorixa linneai*		2	1	1		
Hemiptera	Corixidae	*Hesperocorixa moesta*			1			
Hemiptera	Gerridae	Gerridae nymph					1	1
Hemiptera	Gerridae	*Gerris* sp.		3				2
Hemiptera	Nepidae	*Nepa cinerea*		1				1
Hemiptera	Nepidae	*Ranatra linearis*				1		
Hemiptera	Notonectidae	*Notonecta glauca*		4	1			
Hemiptera	Veliidae	*Veliidae nymph*			1			
Odonata	Aeshnidae	*Anax imperator*		1	2	4	5	5
Odonata	Coenagrionidae	sp. indet.		29	52	16	24	35
Trichoptera	Phryganeidae	*Agrypnia obsoleta*		4	7			1
		Abundance	**280**	**90**	**78**	**40**	**65**	**63**
		Taxon richness, *n*	**11**	**16**	**15**	**16**	**9**	**15**