



APPENDIX 6-2

BAT SURVEY REPORT

Appendix 6-2 Bat Report

Extraction at Lemanaghan
Bog, Co. Offaly





DOCUMENT DETAILS

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1.

INTRODUCTION

MKO was commissioned to complete bat surveys at the Application Site located in Lemanaghan Bog, Co. Offaly. This report provides details of the bat surveys undertaken in 2024 including survey design, methods and results. The 2024 surveys, carried out in accordance with NatureScot, 2021¹, are supplemented by additional data derived from surveys undertaken on the site in 2021.

Bat surveys employed a combination of methods, including desktop study, habitat and landscape assessments, roost inspections, manual activity surveys and static detector surveys at ground level. Detector locations achieved a representative spatial spread and sampled the range of available habitats within the Application Site.

1.1

Irish Bats: Legislation, Policy, and Status

Ireland has nine resident bat species, comprising more than half of Ireland's native terrestrial mammals (Montgomery *et al.*, 2014).

All Irish bats are protected under European legislation, namely the Habitats Directive (92/43/EEC). All Irish species are listed under Annex IV of the Directive, requiring strict protection for individuals, their breeding sites and resting places. The lesser horseshoe bat (*Rhinolophus hipposideros*) is further listed under Annex II of the Directive, requiring the designation of conservation areas for the species. Under this Directive, Ireland is obliged to maintain the favourable conservation status of Annex-listed species. This Directive has been transposed into Irish law through the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011, as amended).

In addition, Irish species are further protected by national legislation (Wildlife Acts 1976, as amended). Under this legislation, it is an offence to intentionally disturb, injure or kill a bat, or disturb its roost. Any work at a roost study area must be carried out with the agreement of the National Parks and Wildlife Service (NPWS).

The NPWS monitors the conservation status of European protected habitats and species and reports their findings to the European Commission every 6 years in the form of an Article 17 Report. The most recent report for the Republic of Ireland was submitted in 2019. Table 1-1 summarises the current conservation status of Irish bat species and identified threats to Irish bat populations.

¹ NatureScot published *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*. Version: August 2021 (NatureScot, 2021).

Table 1-1 Irish Bat Species Conservation Status and Threats (NPWS, 2019). Pressures and Threats are ranked from medium importance (M) to high importance (H) in the 2019 Article 17 report.

Bat Species	Conservation Status	Principal Threats
Common pipistrelle <i>Pipistrellus pipistrellus</i>	Favourable	A05 Removal of small landscape features for agricultural land parcel consolidation (M)
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	Favourable	A14 Livestock farming (without grazing) [impact of anti-helminthic dosing on dung fauna] (M)
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>	Unknown	B09 Clear--cutting, removal of all trees (M)
Leisler's bat <i>Nyctalus leisleri</i>	Favourable	F01 Conversion from other land uses to housing, settlement or recreational areas (M)
Daubenton's bat <i>Myotis daubentonii</i>	Favourable	F02 Construction or modification (e.g. of housing and settlements) in existing urban or recreational areas (M)
Natterer's bat <i>Myotis nattereri</i>	Favourable	F24 Residential or recreational activities and structures generating noise, light, heat or other forms of pollution (M)
Whiskered bat <i>Myotis mystacinus</i>	Favourable	H08 Other human intrusions and disturbance not mentioned above (Dumping, accidental and deliberate disturbance of bat roosts (e.g. caving) (M)
Brown long-eared bat <i>Plecotus auritus</i>	Favourable	L06 Interspecific relations (competition, predation, parasitism, pathogens) (M)
Lesser horseshoe bat <i>Rhinolophus hipposideros</i>	Inadequate	M08 Flooding (natural processes)
		D01 Wind, wave and tidal power, including infrastructure (M)

1.2

Statement of Authority

MKO employs a dedicated bat unit within its Ecology team, who carry out scoping, surveys and reporting on bat surveys, as well as producing impact assessments in relation to bats. MKO ecologists have relevant academic qualifications and are qualified in undertaking surveys to the levels required. MKO's Ecology team holds a bat derogation licence from NPWS.

Scope development and project management was overseen by Aoife Joyce. Bat surveys in 2024 were conducted by Kate Greaney, Frederick Mosley, David Culleton and Nathan Finn. Data analysis was undertaken, and results were compiled by Nathan Finn. The report was prepared by collated by Nora Szijarto and was reviewed by Aoife Joyce. Supplementary activity surveys in 2021 were carried out by Keith Costello (B.Sc.) and Cathal Bergin (B.Sc.).

Table 1-2 Project team qualifications and training

Staff	Role	Training
Aoife Joyce (B.Sc., M.Sc.) 6 years' experience	Project Director	BSc. (Hons) Environmental Science, University of Galway, Ireland. MSc. (Hons) Agribioscience, University of Galway, Ireland. Advanced Bat Survey Techniques – Trapping, biometrics, handling (BCI), Bat Impacts and Mitigation (CIEEM), Bat Tree Roost Identification and Endoscope Training (BCI), Bats in Heritage Structures (BCI), Bats and Lighting (BCI), Kaleidoscope Pro Analysis (Wildlife Acoustics).
Nora Szijarto (B.Sc., M.Sc.) 2 years' experience	Bat Ecologist	B.Sc. Biology, University of Lausanne, Switzerland M.Sc. Behaviour, Evolution and Conservation, University of Lausanne, Switzerland Bat Detector and Survey Training (BCI), Kaleidoscope Pro Analysis (Wildlife acoustics), Endoscope Training (Internal), Structure & Tree

		Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).
Kate Greaney (B.Sc., M.Sc.) 3 years' experience	Ecologist	B.Sc. (Hons) Botany and Plant Science National university of Ireland, Galway, M.Sc. (Hons) Climate Change, Agriculture, and Food Security (MScCCAFS) National university of Ireland, Galway, Kaleidoscope Pro Analysis (Wildlife Acoustics). Endoscope Training (Internal), Emergence and Re-Entry Surveys (Internal) Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal)
Nathan Finn (B.Sc., M.Sc.) 2 years' experience	Bat Ecologist	B.Sc. (Hons) Science, National University of Ireland, Galway. M.Sc. (Hons) Environmental Science, University College Dublin. Bat Detector and Survey Training (BCI), Kaleidoscope Pro Analysis (Internal), Endoscope Training (Internal), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).
David Culleton (B.Sc., M.Sc.) 2 years' experience	Bat Ecologist	B.Sc. Zoology, University College Cork, Ireland. M.Sc. Conservation Behaviour, Atlantic Technological University, Galway, Ireland. Bat Detector and Survey Training (BCI), Kaleidoscope Pro Analysis (Wildlife Acoustics), Endoscope Training (Internal), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).
Frederick Mosley (B.A., M.Sc.)	Seasonal Bat Ecologist	B.A. (Hons) Biological and Biomedical Science Mod. Zoology, Trinity College, Dublin (2022) M.Sc. Marine Biology, University College Cork (2023) Kaleidoscope Pro Analysis (Wildlife Acoustics), Endoscope Training (Internal), Structure and Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal)

2.

SITE DESCRIPTION

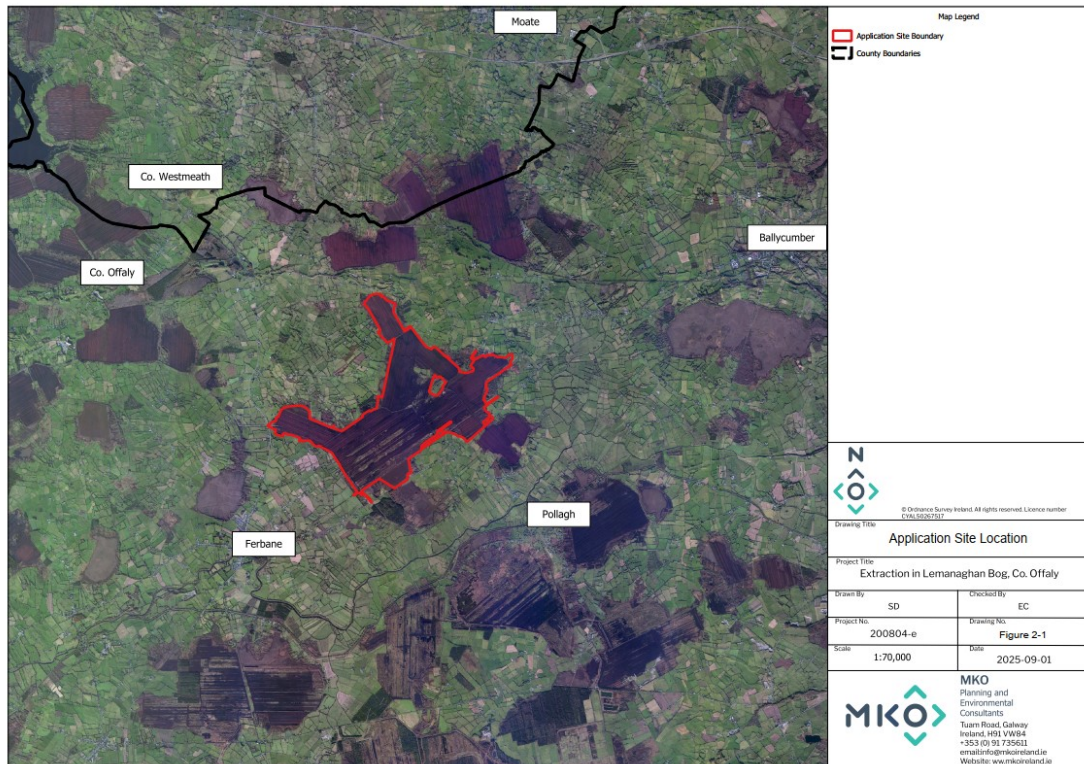
The Application Site, Lemanaghan Bog, forms part of the Boora Bog Group and is located in Lemanaghan and surrounding townlands, north-east of Ferbane, County Offaly. Lemanaghan Bog is located approximately 3.5 kilometres (km) northeast of Ferbane and approximately 2.5 km southwest of the village of Ballycumber in Co. Offaly.

The Application Site comprises an area of 1,109 hectares (ha) within which bog drainage works began in 1950 followed by the commencement of peat extraction from 1960.

The Application Site is connected by rail link to the Bellair South Bog to the north and to the Blackwater Bog Group to the west. The R436 Regional Road passes along much of the southern boundary. The N62 National Road skirts the extreme western tip of the site. A local road passes through the northern part of the site and cuts off the northernmost sector. The current main access points to the Application Site includes an existing entrance off the N62 National Road and along the R426 into the Lemanaghan Works site in the south of the Application Site.

The land-use/activities within the Application Site consists predominantly of bare cut-away peat, re-vegetation of bare peat and scrub. The landcover and uses surrounding the Application Site comprises a mixture of forestry, agricultural land, cutover and cutaway peatland, one-off rural housing and small village settlements. Peat extraction ceased at the Application Site in June 2020.

Figure 2-1 Site Location



3. METHODS

3.1 Desk Study

A desk study of published material was undertaken prior to conducting field surveys. The aim was to provide context to the site in order to assist bat survey planning and assessment. This included the identification of designated sites, species of interest or any other potential risk factors within the site and the surrounding region. The results of the desk study including sources of information utilised are provided below.

3.1.1 Bat Database Records

The National Bat Database of Ireland holds records of bat observations received and maintained by Bat Conservation Ireland (BCI). These records include results of national monitoring schemes, roost records as well as ad-hoc observations. The most recent search examined bat presence and roost records within 10km of a central point within the site (Grid Ref: N 15977 27850). Results from the National Biodiversity Data Centre were also reviewed for bat species present within the relevant 10km grid squares of the Study Area.

3.1.2 Bat Species' Range

EU member states are obliged to monitor the conservation status of natural habitats and species listed in the Annexes of the Habitats Directive. Under Article 17, they are required to report to the European Commission every six years. In April 2019, Ireland submitted the third assessment of conservation status for Annex-listed habitats and species, including all species of bats (NPWS, 2019).

The 2019 Article 17 Reports were reviewed for information on bat species' range and distribution in relation to the site. The aim was to identify any high-risk species at the edge of their range.

3.1.3 Designated Sites

The National Parks and Wildlife Service (NPWS) map viewer and website provides information on rare and protected species, sites designated for nature conservation and their conservation objectives. A search was undertaken of sites designated for the conservation of bats within a 10 km radius of the site (BCI 2012, Hundt, 2012, NatureScot 2021). This included European designated sites, i.e. SACs, and nationally designated sites, i.e. NHAs and pNHAs.

3.1.4 Landscape Features

3.1.4.1 Ordnance Survey Mapping

Ordnance survey maps (OSI 1:5,000 and 1:50,000) and aerial photographs were reviewed to identify any habitats and features likely to be used by bats. Maps and images of the Study area and general landscape were examined for suitable foraging or commuting habitats including woodlands and forestry, hedgerows, treelines, and watercourses. In addition, any potential roost sites, such as buildings and bridges, were noted for further investigation.

3.1.4.2 Geological Survey Ireland

The Geological Survey Ireland (GSI) online mapping tool and University of Bristol Speleological Society (UBSS) Cave Database for the Republic of Ireland were consulted for any indication of natural

subterranean bat sites, such as caves, within 10 km of the site (BCI, 2012) (last searched on the 23rd April 2025). Furthermore, the archaeological database of national monuments was reviewed for any evidence of manmade underground structures, e.g., souterrains, that may be used by bats (last searched on the 23rd April 2025).

3.1.4.3 National Biodiversity Data Centre Bat Landscape Mapping

The National Biodiversity Data Centre (NBDC) map viewer presents “Bat Landscape” maps for individual species and for all species combined. Lundy *et al.* (2011) used Maximum Entropy Models to examine the relative importance of bat landscape and habitat associations in Ireland. The resulting map provides a 5-point scale, ranging from highest habitat suitability index (presented in red) to lowest suitability index (presented in green). However, squares highlighted as less favourable may still have local areas of abundance.

The location of the site was reviewed in relation to bat habitat suitability indices. The aim of this was to assess habitat suitability for all bat species within the Study Area. It is worth noting that these results are based on a modelling exercise and not confirmed bat species records. Regardless, they may provide a useful indication of potential favourable bat associations within the Application Site.

3.2 Field Surveys

3.2.1 Roost Surveys

The site was first inspected for roosts in 2021. Visits were carried out in April, June and August 2021. Additional searches for roosts were undertaken within the site in 2024. The aim of these searches was to determine the presence of Potential Roost Features (PRFs) and the potential presence of roosting bats. A search for structures and likely suitable roosting areas was first conducted during initial desktop studies of the site. A walkover was carried out and structures and trees within the site were assessed for their potential to support roosting bats. This comprised a detailed inspection of the interior, if accessible, and exterior to look for evidence of bat use, including live and dead specimens, droppings, feeding remains, urine splashes, fur oil staining and noises.

Any potential tree roosts were examined from the ground for the presence of rot holes, hazard beams, cracks and splits, partially detached bark, knot holes, gaps between overlapping branches and any other potential roost features (PRFs) identified by Andrews (2018).

3.2.2 Manual Activity Survey

Manual activity surveys included emergence surveys, walked or driven transects at dusk. A series of representative transect routes were selected throughout the Application Site. The aim of these surveys was to identify bat species using the site and gather any information on bat behaviour and important features used by bats.

Table 3-1 Survey Effort - Manual Activity Surveys

Date	Surveyors	Sunset	Type	Start-End	Weather	(km)
April, June, August 2021	Cathal Bergin and Keith Costello	20:40, 21:50, 20:58	Emergence and Dusk Transects	30minutes before sunset up to 3 hours after	11 °C, dry, light breeze; 18 °C, dry, light breeze; 17 °C, dry, light breeze;	6.2 9.2 7.3
2024						

18 th April 2024	Kate Greaney and Fred Mosley	20:35	Dusk Emergence	20:20 - 21:50	13°C, Dry, Calm, Moon not visible, 95-100% cloud cover.	n/a
18 th April 2024	Kate Greaney and Fred Mosley		Walked Transect	21:50 – 23:20	10-11°C, Dry, Calm - light breeze, Moon not visible to partially visible, 80-95% Cloud cover.	4.8
7 th August 2024	Kate Greaney and Fred Mosley	21:14	Emergence and Walked Transect	21:14 – 23:14	16-17°C, Dry - light drizzle, Light breeze, Moon not visible, 100% Cloud cover.	8.4
3 rd October 2024	Nathan Finn and Fred Mosley	19:01	Walked and Driven Transect	19:01 – 22:01	12-14°C, Dry – drizzle, Light breeze, Moon not visible, 60-95% Cloud.	11 (6.25 driven and 4.75 walked)
Total Survey Effort 2024						24.2

3.2.2.1 Dusk Emergence Survey

Dusk emergence surveys were undertaken on the evenings of 21st April 2021, 16th August 2021, 18th April 2024 and 7th August 2024. The emergence survey commenced 30 minutes before sunset and concluded within 1.5 hours after sunset.

Three structures were identified as having potential for roosting bats and were subject to a presence/absence survey following the initial roost assessment.

Surveyors were located at different locations with a focus on potential access point and roosting features identified during the daylight walkover survey. The purpose was to identify any potential bat species, numbers, access points and roosting locations within the PRF structure. The survey was carried out in favourable weather conditions (Table 3-1).

3.2.2.2 Transect Surveys

Transect routes were prepared with reference to the proposed layout, desktop and walkover survey results as well as any health and safety considerations and access limitations. As such, transect routes generally followed existing roads and tracks. Transect routes for 2024 are presented in Figures 4-1 to 4-3 below. Table 3-1 summarises survey effort in relation to manual activity surveys.

Transects were walked or driven by two surveyors, recording bats in real time. Surveys commenced 30 minutes before sunset and were completed for up to 3 hours after sunset. Surveyors were equipped with active full spectrum bat detectors, the Batlogger M bat detector (Elekon AG, Lucerne, Switzerland), and all bat activity was recorded for subsequent analysis to confirm species identifications.

3.2.3

Ground-level Static Surveys

Full spectrum bat detectors, Song Meter SM4BAT (Wildlife Acoustics, Maynard, MA, USA), were employed using settings recommended for bats, with minor adjustments in gain settings and band pass filters to reduce background noise when recording. Detectors were set to record from 30 minutes before sunset until 30 minutes after sunrise. The Song Meter automatically adjusts sunset and sunrise times using the Solar Calculation Method when provided with GPS coordinates.

Onsite weather monitoring was undertaken concurrently with static detector deployments. One Vantage Pro 2 (Davis Instruments, CA, UCS) was deployed each season and night-time hourly data was tracked remotely to ensure a sufficient number of nights (i.e., minimum 10 no.) with appropriate weather conditions were captured (i.e., dusk temperatures above 8°C, wind speeds less than 5m/s and no or only very light rainfall). Table 3-2 summarises survey effort achieved in 2024 for each detector locations. Detector D01 was redeployed in autumn due to technical difficulties.

Table 3-2 Survey Effort - Ground-level Static Surveys 2024

Season	Survey Period	Total Survey Nights per Detector Location	Nights with Appropriate Weather
Spring	18th April - 3rd May 2024	15	14
Summer	9th July - 7th August 2024	29	29
Autumn	3rd - 30th October 2024	27	21
Autumn Redeployment (D01)	30 th October – 12 th November 2024	13	12
Total survey effort		84	76

Automated bat detectors were deployed at 12 no. locations for at least 10 nights in 2024 in spring (April-May), and at least 20 nights in summer (June-mid August) and autumn (mid-August-October) (NatureScot, 2021). Detector locations achieved a representative spatial spread of the study area and sampled the range of available habitats. Figure 3-1 presents static detector locations in relation to the site. Static detector locations are described in Table 3-3.

Table 3-3 Ground-level Static Detector Locations

ID	Location (ITM)	Habitat	Linear Feature within 50m
D01	614203, 727365	Cutover bog.	None
D02	614769, 726500	Cutover bog.	Scrub
D03	614963, 727570	Cutover bog.	None
D04	616471, 728200	Cutover bog.	None
D05	615358, 727039	Cutover bog and scrub.	Scrub
D06	615645, 727908	Cutover bog.	None
D07	616033, 727570	Cutover bog.	Scrub
D08	615954, 728720	Cutover bog and scrub.	None
D09	615717, 729467	Cutover bog.	Scrub
D10	616393, 729345	Cutover bog.	None
D11	617679, 728857	Cutover bog.	None
D12	617363, 728138	Cutover bog.	None

Figure 3-1 Static Survey Effort



3.3

Bat Call Analysis

All recordings from 2024 were later analysed using bat call analysis software Kaleidoscope Pro v.5.4.8 (Wildlife Acoustics, MA, USA), respectively. The aim of this was to identify, to a species or genus level, what bats were present at the Study area site. Bat species were identified using established call parameters, to create site-specific custom classifiers and were manually verified.

Echolocation signal characteristics (including signal shape, peak frequency of maximum energy, signal slope, pulse duration, start frequency, end frequency, pulse bandwidth, inter-pulse interval and power spectra) were compared to published signal characteristics for local bat species (Russ, 1999). Myotis species (potentially Daubenton's bat (*M. daubentonii*), Whiskered bat (*M. mystacinus*), Natterer's bat (*M. nattereri*) were considered as a single group, due to the difficulty in distinguishing them based on echolocation parameters alone (Russ, 1999). The echolocation of soprano pipistrelle (*P. pygmaeus*) and common pipistrelle (*P. pipistrellus*) are distinguished by having distinct frequencies (peak frequency of maximum energy in search flight) of ~55 kHz and ~46 kHz respectively (Jones & van Parijs, 1993).

Plate 3-1 below shows a typical sonogram of echolocation pulses for Common pipistrelle recorded with a SM4BAT bioacoustics static bat recording device. The recorded file is illustrated using Wildlife Acoustics Kaleidoscope software.

Individual bats of the same species cannot be distinguished by their echolocation alone. Thus, 'bat passes' was used as a measure of activity (Collins, 2023). A bat pass was defined as a recording of an individual species/species group's echolocation containing at least two echolocation pulses and of maximum 15s duration. All bat passes recorded in the course of this study follow these criteria, allowing comparison.

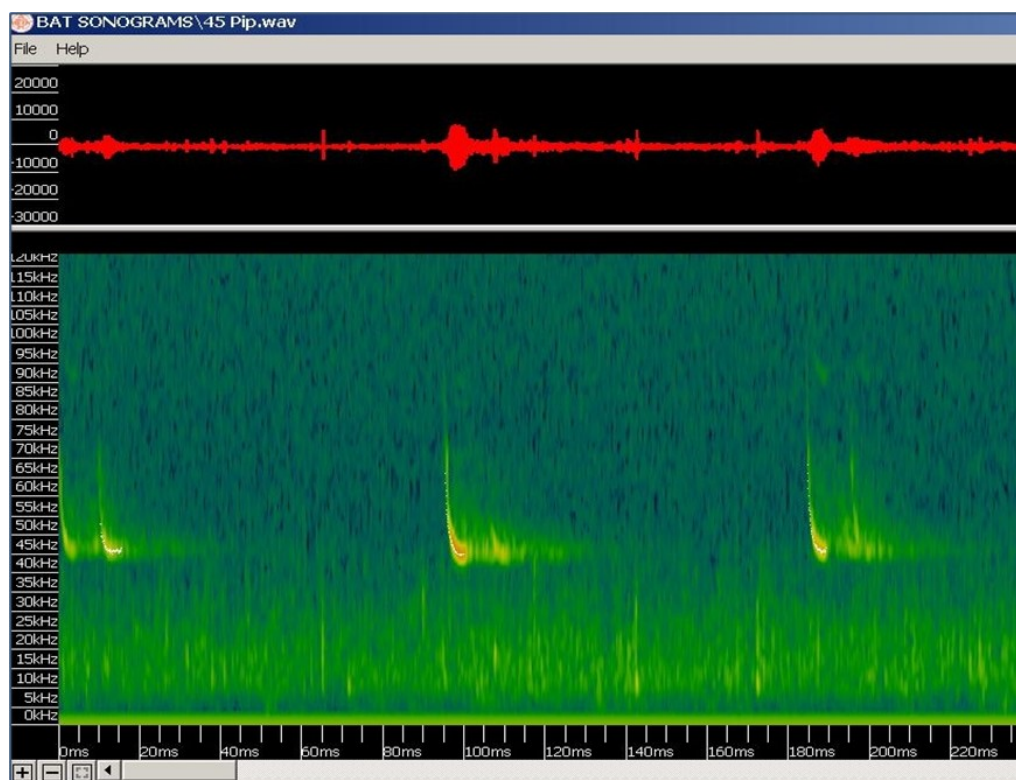


Plate 3-1 Sonogram of Echolocation Pulses of Common pipistrelle (Peak Frequency 45kHz)

4. RESULTS

4.1 Desk Study

4.1.1 Bat Records

National Biodiversity Data Centre

The National Bat Database of Ireland was searched for records of bat activity and roosts within a 10 km hectad of the site was made on the 23rd April 2025. The search yielded records for five bat species within 10km hectad. Table 4-1 lists the bat species recorded within the hectads which pertains to the site (N12 and N13).

Table 4-1 NBDC Bat Records within 10km of Application Site

Grid Square	Species	Database	Designation
N12, N13	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	National Bat Database of Ireland	HD Annex IV, WA
N12	Brown long-eared bat (<i>Plecotus auritus</i>)	National Bat Database of Ireland	HD Annex IV, WA
N12, N13	Lesser Noctule (<i>Nyctalus leisleri</i>)	National Bat Database of Ireland	HD Annex IV, WA
N12	Daubenton's Bat (<i>Myotis daubentonii</i>)	National Bat Database of Ireland	HD Annex IV, WA
N12, N13	Common Pipistrelle (<i>Pipistrellus pipistrellus sensu stricto</i>)	National Bat Database of Ireland	HD Annex IV, WA

4.1.2 Bat Species Range

The potential for negative impacts is likely to increase where there are high risk species at the edge of their range (NatureScot, 2021). Therefore, range maps presented in the 2019 Article 17 Reports (NWPS, 2019) were reviewed in relation to the location of the site.

The site is located outside the current known range for lesser horseshoe bat and whiskered bat. The site is partially outside or at the edge of the range for Nathusius' pipistrelle and Natterer's bat and within range for all other species.

4.1.3 Designated Sites

Within Ireland, the lesser horseshoe bat is the only bat species requiring the designation of Special Areas of Conservation (SACs) and the Application site is situated outside the current known range of this species. Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) may be designated for any bat species. A search of all SACs, NHAs and pNHAs within a 10 km radius of the Study Area found no sites designated for the conservation of bats.

4.1.4 Landscape Features and Habitat Suitability

A review of mapping and photographs provided insight into the habitats and landscape features present at the Application site. In summary, the primary land use within the site is cutover bog.

A review of the GSI online mapper did not indicate the possible presence of any subterranean sites within the site. A search of the National Monuments Database did not reveal the presence of any manmade subterranean areas within the site.

A search of the UBSS Cave Database for the Republic of Ireland found no caves within the Application site or within 10km of the site boundary.

A review of the NBDC bat landscape map provided a habitat suitability index of 20.33 (green) to 26.11 (yellow). This indicates that the site has low habitat suitability for bat species.

4.2 Field Surveys

4.2.1 Roost Surveys

Three structures were identified at Lemanaghan, adjacent to the Application site boundary. Roost inspections and emergence surveys were carried out to establish whether any bat roosts were present. The structures are located in close proximity to each other.

4.2.1.1 Structure 1 - Stone house

A small stone house was identified to the north of the site (Grid Ref: E216687 N228777). Several Potential Roost Features (PRF's) were identified throughout the structure. The structure is overgrown with ivy (*Hedera helix*) which provides potential suitable cover and shading for roosting bats and access points. Other potential access points include loose roof tiles/slates, gaps in lead flashing around the chimney and open windows (Plate 4-1). There is also direct access between the attic and the interior of the structure (Plates 4-2 & 4-3); however, there is significant light penetration into the body of the house, as shown in Plate 4-4. The stone house provides *Moderate* roosting potential for bats; however, following an interior and exterior inspection, no evidence of roosting bats were found.



Plate 4-1 Exterior of house showing open windows and ivy overgrowth



Plate 4-2 Interior of house showing potential access to the attic



Plate 4-3 Interior of house showing access to the attic



Plate 4-4 Interior of house showing influx of light

4.2.1.2 Structure 2 - Stone Shed

A stone shed was identified immediately adjacent to the stone house (above) (Grid Ref: E216685 N228785) and was subject to a roost inspection. The building is comprised of stonework and a galvanised sheet metal roof with supporting timber frames. Gaps in the stonework and beneath the timber frame provide potential roosting habitat for bats. However, there is significant light penetration throughout the structure (Plate 4-5). This structure was assessed as having *Low* roosting potential i.e., a structure with one or more potential roost sites that could be used opportunistically by bats. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity or hibernation) (Collins, 2023). An interior and exterior inspection did not reveal any evidence of bats roosting in this structure.



Plate 4-5 Interior of stone shed showing galvanised roof, timber framing, stonework and influx of light.

4.2.1.3 Structure 3 - Steel and Concrete Block Shed

A large agricultural shed was located close to the previous two structures, to the north of the site (Grid Ref: E216709 N228782). The structure is comprised predominantly of galvanised sheet metal with supporting timber slats and a metal frame. Concrete block walls also make up a portion of the exterior structure (Plate 4-6). Overall, the structure does not provide significant suitable roosting habitat for bats and was assessed as having *Negligible* suitability. There is considerable light influx into the structure, and it is exposed to the elements on two facades. Following an interior and exterior inspection, no evidence of roosting bats were found.



Plate 4-6 Exterior of large shed



Plate 4-7 Exterior of large shed showing external brick wall

The site was also checked for potential tree roosts but no trees with significant roosting features were identified within the site. Trees may have increased or decreased probability of hosting roosting bats in certain circumstances i.e. Having large broadleaf trees with cavities or other damage such as rot or loose bark increased probability whereas, conifer plantations and young trees with little – no damage have a decreased probability of hosting bats (Kelleher and Marnell, 2006). Trees within the site lacked the features and size to host roosting bats. No potential tree roosts were identified within the study area.

4.2.2 Manual Activity Surveys

4.2.2.1 Dusk Emergence Surveys

Dusk emergence surveys were carried out on the three structures in April and August 2021 and April and August 2024. No bats were recorded emerging from any of the structures in 2021. However, five bats were observed emerging from the stone house in April 2024. These included 4no. soprano pipistrelle and 1no. suspected brown long-eared bat.

4.2.2.2 Transect Surveys

Manual activity surveys were undertaken in the form of walked or driven transects in Spring, Summer and Autumn 2024. Common pipistrelles were the most recorded species (n= 156), followed by soprano pipistrelles (n=44) and Leisler's bat (n=9). Brown long-eared bat and *Myotis spp.* were rare (Plate 4-8). Transect survey results were calculated as bat passes per km surveyed (to account for differences in survey effort) (Plate 4-9). The Spring survey recorded the highest number of bat passes per kilometre. Bats have been recorded commuting and feeding around the site during all seasonal surveys.

Figure 4-1 Figure 4-2Figure 4-3 present the spatial distribution of bat activity across the surveys.

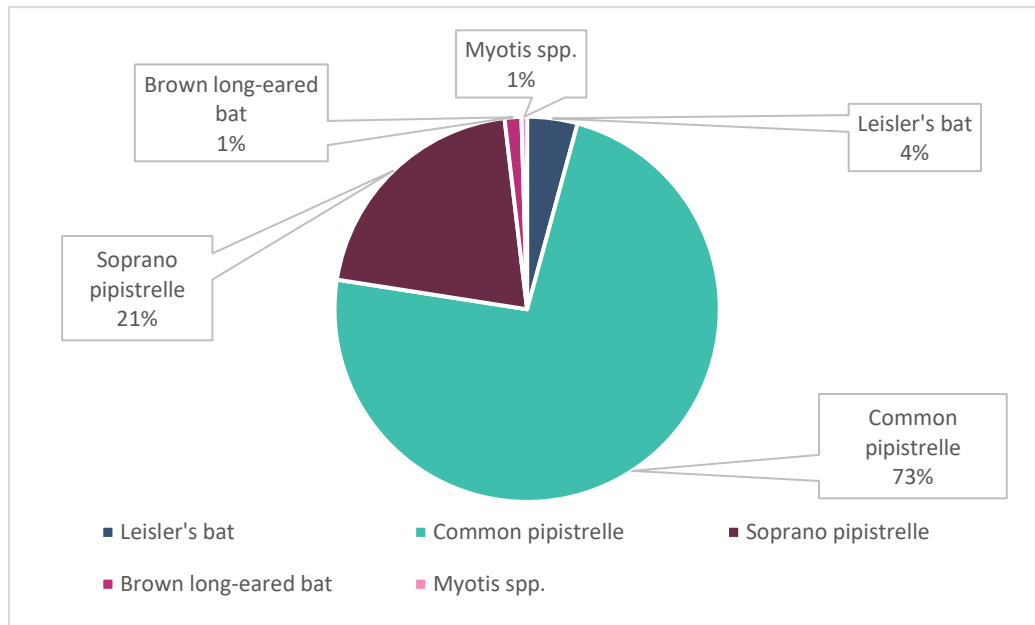


Plate 4-8 Manual surveys 2024

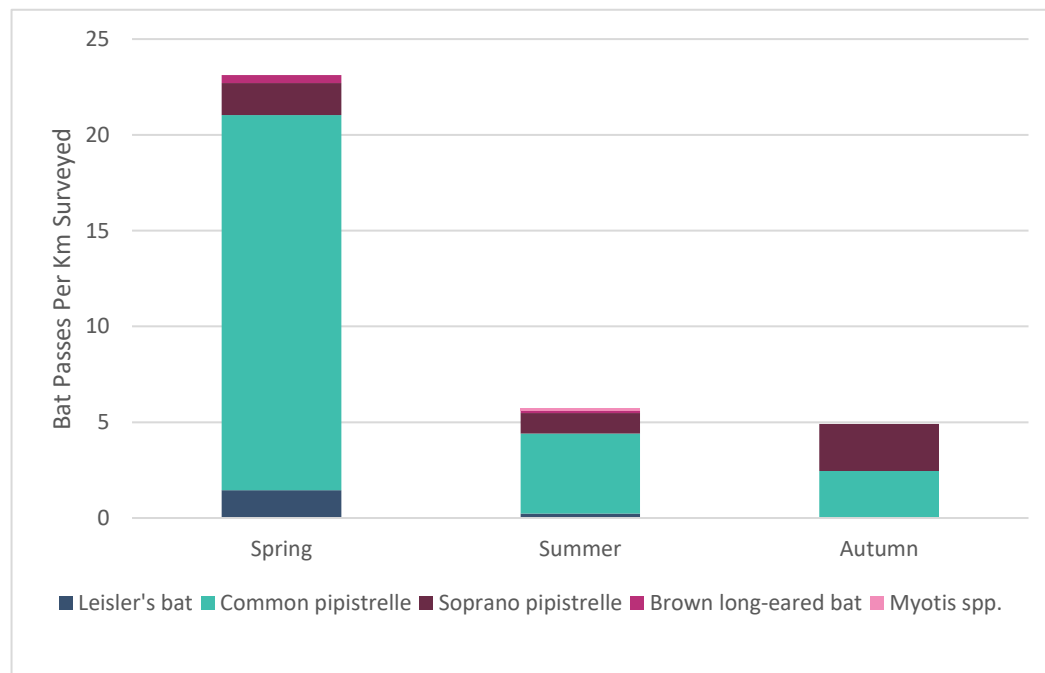


Plate 4-9 Manual Surveys 2024: Bat activity per seasonal survey

Figure 4-1 Manual results Spring 2024



Figure 4-2 Manual results Summer 2024



Figure 4-3 Manual results Autumn 2024



4.2.3 Ground-level Static Surveys

SM4 static detectors were deployed on the site at twelve different locations (D01 to D12) across spring, summer and autumn 2024. In total 67,296 bat passes were recorded. Analysis of the detector recordings positively identified six bats to species level with *Myotis* spp. also present. In general, Common pipistrelle (n=44,344) was recorded much more frequently than all other species. The second and third most frequently recorded species were Soprano pipistrelle (n=12,647) and Leisler's bat (n=8,829), respectively. *Myotis* spp. (n=826) and Brown long-eared bat (n=579) were recorded significantly less frequently on site. *Nathusius*' pipistrelle (n=71) was rarely recorded during our static detector deployments in 2024. Plate 4-10 shows total bat species composition recorded at the site.

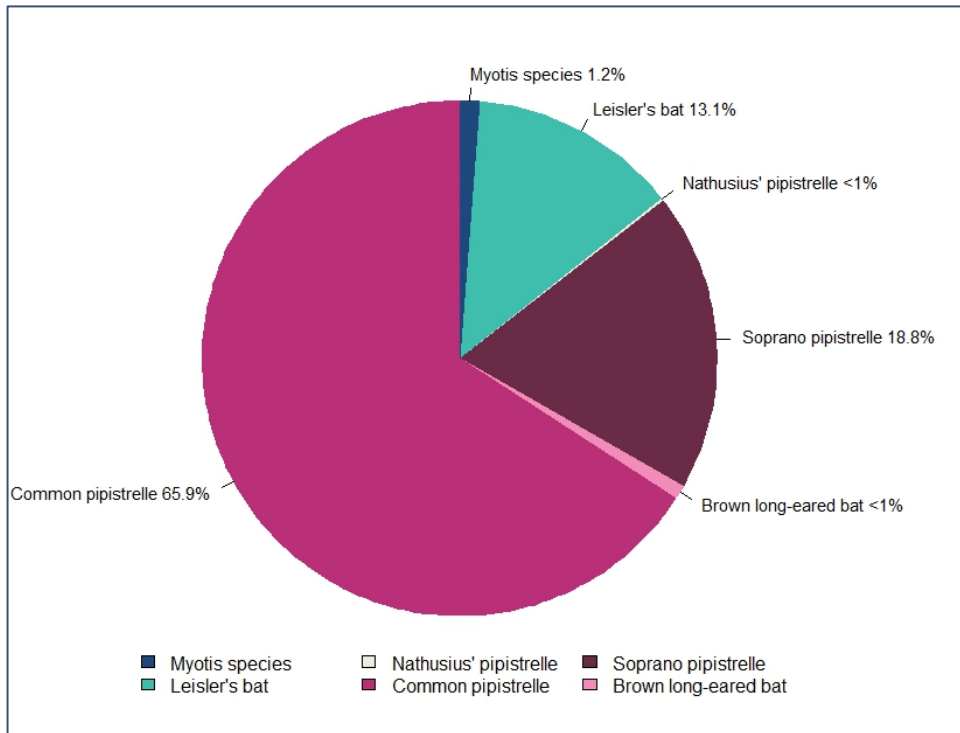


Plate 4-10 Total bat species composition 2024.

Bat activity was calculated as total bat passes per hour (bp/h) per season to account for any bias in survey effort, resulting from varying night lengths between seasons. Plates 4-11 and Table 4-2 presents these results for each species and season (bp/h per season). Plate 4-12 displays the bat species composition for each survey period in the 2024 season. Overall, bat activity was highest in summer. Slightly lower levels of bat activity were recorded in spring and significantly lower overall bat activity was recorded during the autumn survey period.

Bat activity was dominated by common pipistrelle in all seasons. The least abundant species was *Nathusius*' pipistrelle. The activity composition for each of the other species, although similar across seasons, varied slightly. Leisler's bat was the second most active bat at the Site in Spring (22.9% of bat passes), with activity decreasing significantly as the year passed (10.1% of all bat passes in Summer and 4.1% in Autumn). Soprano pipistrelle, although somewhat active in Spring (13.6% of all bat passes in spring), was most active in Autumn (21.4%) - recording similar relative activity levels in Summer (20.7%). Brown long-eared bat was recorded very infrequently in spring and summer (<1%) but represented a higher percentage of bat passes in autumn (4.1%). *Myotis* species abundance increased as the year progressed (spring = 0.7%; summer = 1.2%; autumn = 3.1%). *Nathusius*' pipistrelle represented <1% of all bat passes in all seasons.

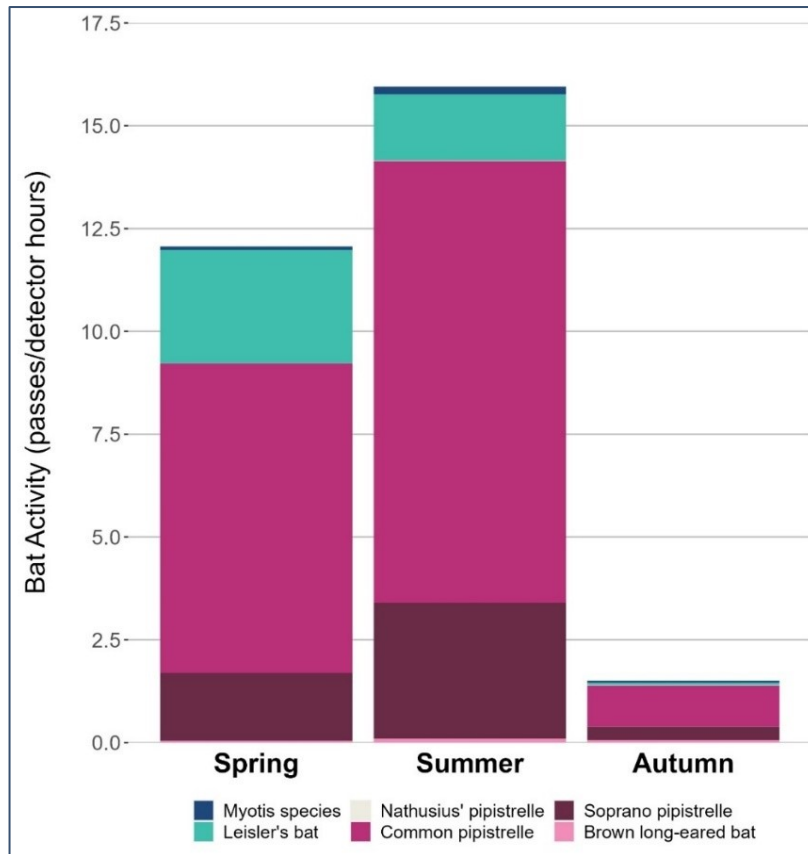


Plate 4-11 Bat Activity in Each Season During 2024 Ground-level Static Surveys.

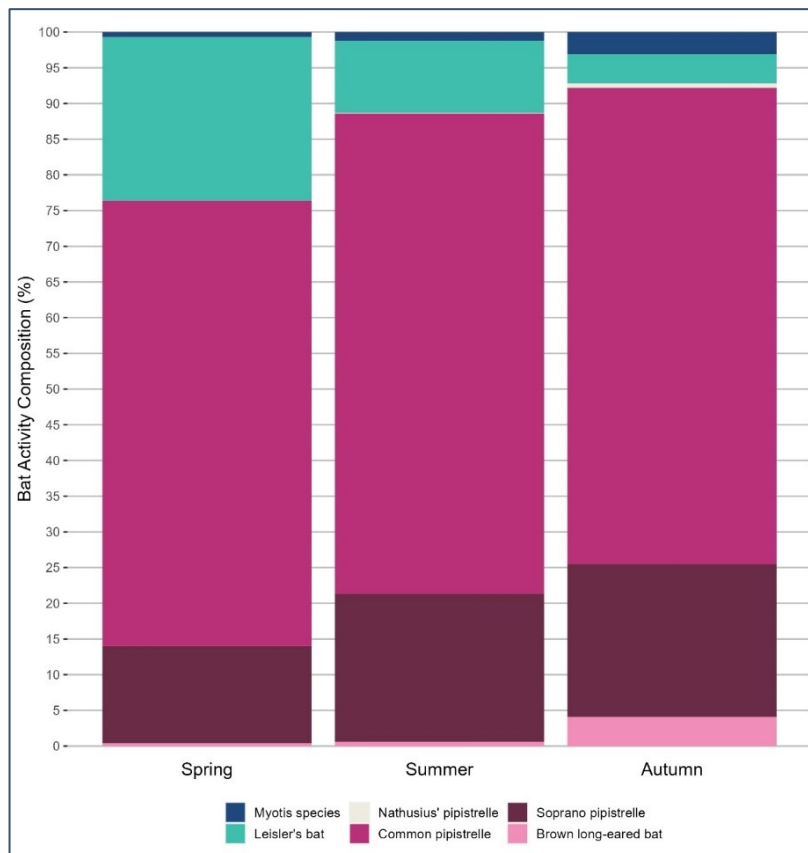


Plate 4-12 Bat Species Composition in Each Survey Season

Table 4-2 Static Detector Surveys: Species Composition Across All Deployments (Total Bat Passes Per Hour, Per Season).

	2024			
	Spring	Summer	Autumn	Autumn Redeployment (D01)
Total survey hours (all detectors)	139.6	230	363.7	162.2
<i>Myotis</i> spp.	0.9	2.2	0.5	<0.1
Leisler's bat	30.9	18.5	11.2	<0.1
Nathusius' pipistrelle	<0.1	<0.1	0.1	0.0
Common pipistrelle	84.2	123.4	3.6	0.8
Soprano pipistrelle	18.4	37.9	0.7	0.2
Brown long-eared bat	0.5	1.1	0.7	<0.1

Plate 4-13 illustrates the median nightly pass rate per species and deployment season in 2024. Zero data, when a species was not detected on a night, was also included in the median calculations. Total median values tended to vary per detector location and across the seasons. Despite the variations, D12 seemed to always have the highest level of activity made up of mostly common pipistrelle.



Plate 4-13 2024 Static Detector Surveys: Median Nightly Activity (Bat Passes Per Hour) per Detector, Calculated Including Absences Per Detector Per Survey Period. Note the variable y-axes for each season.

4.3

Importance of Bat Population Recorded at the Site

Ecological evaluation within this section follows a methodology that is set out in Chapter three of the ‘*Guidelines for Assessment of Ecological Impacts of National Roads Schemes*’ (NRA, 2009).

All bat species in Ireland are protected under the Bonn Convention (1992), Bern Convention (1982) and the EU Habitats Directive (92/43/EEC). Additionally, in Ireland bat species are afforded further protection under the Birds and Natural Habitats Regulations (2011) and the Wildlife Acts 1976, as amended. No bat roosts were identified within the footprint of the site. Bats as an Ecological Receptor have been assigned **Local Importance (Higher value)** on the basis that the habitats within the site are utilized by a regularly occurring bat population of Local Importance.

No roosting site of National Importance (i.e., greater than 100 individuals) was recorded within the site. The Application Site does not support a roosting site of ecological significance.

4.4

Limitations

A comprehensive suite of bat surveys has been undertaken at the Study Area in 2024. The surveys provide the information necessary to determine what species of bats are present and how they are utilising the site.

The information provided in this report accurately and comprehensively describes the baseline environment and bat populations at the site. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines.

Surveys were carried out during suitable survey periods for bat activity surveys, (Collins, 2023) and weather conditions were suitable for carrying out all surveys.

No limitations in the scope, scale or context of the assessment have been identified. Overall, a comprehensive assessment has been achieved.

5. OVERALL FINDINGS

Six bat species (including *Myotis* spp. as a genus) were recorded across the site in 2024. The habitats within the site provide suitable commuting and foraging habitat for a regularly occurring population of bat species of local importance higher value.

No bat roosts were identified within the Application site boundary in 2024, and the site overall provides suboptimal roosting opportunities. However, one bat roost (4 soprano pipistrelle and 1 suspected brown long-eared bat) was identified in proximity to the site in 2024. Trees on site comprised a mix of immature, semi-mature and mature broadleaf and conifer species and scrub. As such, the majority of trees within the site lacked suitable PRFs for roosting bats.

Although bats were recorded within the site, the site in its unmodified state, as an active raised bog prior to peat extraction activities, is unlikely to have supported significant woodland and scrub habitat suitable for bat habitat. The linear landscape features currently present within the site as secondary habitats of cutover bog, including woodland and scrub habitat, have come about as a result of natural revegetation of the cutover bog following cessation of peat harvesting activities. These areas of woodland and scrub provide foraging and commuting habitat for bats species would have been largely absent in remnant uncut raised bog and large areas of bare peat that would have existed in 1988. The implementation of the rehabilitation plan for Lemanaghan Bog is unlikely to have a significant effect on bats.

This report provides a full and comprehensive assessment of bat activity within the site in 2024. The surveys and results provided in this report are in accordance with the relevant industry guidance.

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