

Ballivor Bog Group Substitute Consent Application Remedial Environmental Impact Assessment Report

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APPENDIX 6-2

BAT SUMMARY REPORT



Appendix 6-2 Bat Report

Extraction in the Ballivor Bog Group, Co. Meath & Westmeath







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1. INTRODUCTION

MKO was commissioned to complete bat surveys at the Application Site, located in Co. Meath and Co. Westmeath. This report provides details of the bat surveys undertaken, including survey design, methods and results.

Bat surveys were undertaken throughout 2020 and 2022 and are consistent with the methodologies described in NatureScot 2021¹ and Collins 2016². 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 and at height. Detector locations achieved a representative spatial spread and sampled the range of available habitats within the Application Site.

III 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).

² Collins J. (ed.) published Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn) (Collins, 2016).



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

Table 1-1 Irish Bat Species Conservation Status and Threats (NPWS, 2019)

1.2 Statement of Authority

Scope development and project management was overseen by Aoife Joyce (BSc., MSc.) and John Hynes (BSc., MSc., MCIEEM).

Bat surveys carried out in 2020 were conducted by MKO ecologists Aoife Joyce, Luke Dodebier (BSc.) Claire Stephens (BSc.), Neil Campbell (BSc., MSc.), and Cathal Bergin (BSc.). Bat surveys carried out in 2022 were conducted by MKO ecologists Shane Connolly (BSc.), Laura McEntegart (BSc.) and Neil Campbell. All staff have relevant academic qualifications to complete the surveys and assessments that they were required to do.

Data analysis for 2020 was undertaken and results compiled by Aoife Joyce. Data analysis for 2022 was undertaken by Laura Gránicz (BSc., MSc.), and results were compiled by Shane Connolly (BSc.). This report was prepared by Shane Connolly (BSc.) and was reviewed by Aoife Joyce (BSc., MSc.) and Pat Roberts (BSc.) who have over 5 years' and 18 years' experience in ecological assessment, respectively.

Staff	Role	Training		
Pat Roberts (B.Sc., MCIEEM)	Principal Ecologist	 B.Sc. Environmental Science, University of Galway, Ireland. 18+ years post graduate experience working as a professional ecologist. Over 10 years previous experience working as a nature conservation warden, tree surgeon/surveyor. Bat Detector Workshop (Bat 		
		Conservation Ireland). Bats & Arboriculture Training Course, (BCT & Arboricultural Association).		
John Hynes (B.Sc., M.Sc., MCIEEM)Ecology DirectorB.Sc. in Environmental Science, University of Galwa M. Sc. Applied Ecology, University College Cork (20)		B.Sc. in Environmental Science, University of Galway, Ireland (2010). M. Sc. Applied Ecology, University College Cork (2011).		
		Full member of the Chartered Institute of Ecology and Environmental Management. Extensive experience regarding Habitats Directive		

Table 1-2 Project team qualifications and training



		Assessment and EIS preparation of a number of Windfarm		
		developments, of construction supervision and monitoring of		
		development sites, and dealing with statutory ecological consultees in		
		Ireland over past 12 years.		
Aoife Joyce (B.Sc.,	Project	B.Sc. (Hons) Environmental Science, University of Galway, Ireland.		
M.Sc.)	Director	M.Sc. (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)		
Claire Stephens	Ecologist	B.Sc. (Hons) Environmental Science University of Galway Ireland		
(BSc.)	200109.00			
(200.)		Emergence and Re-Entry Surveys (Internal), Static deployment and		
		collection, Structure & Tree Inspection (Internal), Manual Transect		
		Survey (Internal), Bat Habitat Appraisal (Internal).		
Cathal Bergin	Ecologist	B.Sc. Wildlife Biology from MTU.		
(DOC.)		Emergence and Re-Entry Surveys (Internal), Static deployment and		
		collection, Structure & Tree Inspection (Internal), Manual Transect		
		Survey (Internal), Bat Habitat Appraisal (Internal).		
Luke Dodebier	Ecologist	B.Sc. Wildlife Biology from MTU.		
(BSc.)				
		Bat Impacts and Mitigation (CIEEM), Kaleidoscope Pro Analysis		
		(Wildlife Acoustics), Static deployment and collection, Endoscope		
		Structure & Tree Inspection (Internal) Manual Transect Survey		
		(Internal) Bat Habitat Appraisal (Internal)		
Neil Campbell	Ecologist	B.Sc. Botany and Plant Science, National University of Ireland, Galway.		
(B.Sc., M.Sc.)		M.Sc. Botany and Plant Science, National University of Ireland,		
		Galway.		
		Kaleidoscope Pro Analysis (Wildlife Acoustics), Endoscope Training		
		Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-		
		Entry Surveys (Internal).		
Laura McEntegart	Ecologist	B.Sc. (Hons) Botany and Plant Science, National university of Ireland,		
(B.Sc.)		Galway		
		Bat Handling Training Course (BCI), Bats: Assessing the Impact of		
		Development on Bats, Mitigation & Enhancement - (CIEEM),		
		(Internal) Emergence and Re-Entry Surveys (Internal) Structure & Tree		
		Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat		
		Appraisal (Internal).		
Laura Gránicz	Project	B.Sc. Biology, University of Szeged, Hungary.		
(B.Sc., M.Sc.)	Ecologist	M.Sc. Biology, University of Pécs, Hungary.		
		Structure & Tree Inspection (Internal), Manual Transect Survey		
		Surveys (Internal), Advanced Bat Survey Techniques (BCI)		
		Kaleidoscope Pro Analysis (Wildlife Acoustics).		
Shane Connolly	Ecologist	B.Sc. (Hons) in Botany and Plant Science, National University of		
(B.Sc.)	0	Ireland, Galway.		
		Endoscope Training (Internal), Emergence and Re-Entry Surveys		
		(Internal), Structure & Tree Inspection (Internal), Manual Transect		
		Survey (memai), bai mabiai Appraisai (memai)		



2. SITE DESCRIPTION

The Application Site comprises five bogs located at the Westmeath-Meath County border. The bogs include Ballivor Bog at the southern extent of the site, Carranstown and Bracklin Bogs towards the centre of the site and Lisclogher and Lisclogher West Bogs to the north. The Application Site will hereafter be referred to as the "Study Area" and comprises an overall site area of 2,421 hectares (ha).

The site is located approximately 3.7km west of the village of Raharney, 4.5km south of Delvin town, Co. Westmeath and 2.5km east of Ballivor village, Co. Meath. The Application Site is bisected by the R156 which joins the villages of Ballivor in the east to Raharney in the west.

The land-use/activities within the Study Area predominantly consists of bare cut-away peat, revegetation of bare peat and scrub and rehabilitation of commercial peatland. Land-use in the surrounding landscape comprises a mix of agricultural land, pockets of in-tact bog, cutaway peatlands, forestry, village settlements and one-off rural housing.





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 Study Area 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 Study Area 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 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 Study Area (Grid Ref: N 64592 54895). Available bat records were provided by Bat Conservation Ireland on 3rd March 2022. 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 location of the Study Area. 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 10km radius of the Study Area. 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 10km of the Study Area (BCI, 2012) (last searched on the 9th of July 2024). 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 9th of July 2024).

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 Study Area was reviewed in relation to bat habitat suitability indices. The aim of this was to assess habitat suitability for all bat species within the Application Site. 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**

A search for roosts was undertaken within the site in 2020 and 2022. The aim was to determine the presence of roosting bats. A walkover was carried out and structures and trees were assessed for their potential to support roosting bats.

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

3.2.2 Manual Transects

Manual activity surveys comprised walked transects at dusk and/or dawn throughout 2020 and 2022. A series of representative transect routes were selected throughout the 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. Transect routes were prepared with reference to linear features on site, 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 are presented in Figures 3-1 to 3-6.

Transects were walked by two surveyors, recording bats in real time. Dusk surveys commenced 30 minutes before sunset and were completed for up to 3 hours after sunset. Dawn surveys commenced 2 hours before sunrise and were completed at sunrise. 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. Transect surveys were undertaken in Spring, Summer and Autumn of 2020 and 2022. Table 3-1 summarises survey effort in relation to walked transects.



Date	Surveyors	Sunrise/	Туре	Weather	Walked
		Sunset			(km)
23 rd April	Aoife Joyce and	20:45	Dusk	15°C, dry, calm/light air	8.8km
2020	Luke Dodebier				
24 th April 2020	Aoife Joyce and	06:06	Dawn	6°C, dry, 70 % cloud	3.8km
	Luke Dodebier			cover, calm/ light air.	
4 th June 2020	Luke Dodebier and	21:50	Dusk	12°C, dry, 40% cloud	8.9km
-	Claire Stephens			cover, calm/light air	
5 th June 2020	Luke Dodebier and	05:03	Dawn	10°C, dry, 100% cloud	6.3km
	Claire Stephens			cover, calm/ light air	
3 rd September	Neil Campbell	20:13	Dusk	15°C dry, 20-30% cloud	6km
2020	Cathal Bergin			cover, calm/ light air	
4 th September	Neil Campbell	06:42	Dawn	10°C, dry, 50% cloud	4.2km
2020	Cathal Bergin			cover, calm/ light air	
Total Survey Effort for 2020 3					38km
Date	Surveyors	Sunrise/	Туре	Weather	Walked
		Sunset			(km)
26 th April 2022	Shane Connolly and	20:49	Dusk	10°C, dry, 25% cloud,	7.9km
_	Laura McEntegart			calm air	
19 th August	Shane Connolly and	21:43	Dusk	18°C, dry, 90% cloud	11km
2022	Laura McEntegart			cover, calm air	
20 th October	Shane Connolly and	18:20	Dusk	9°C dry, 50% cloud	3.2km
2022	Neil Campbell			cover, calm/ light air	
Total Survey Ef	fort for 2022				22.1km

Table 3-1 2020 and 2022 Survey Effort - Manual Transects















3.2.3 Ground-level Static Surveys

Automated 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. Eighteen detectors were deployed in 2020 and fifteen detectors were deployed in 2022. Locations of static detectors were selected to represent the range of habitats present within the site, including favourable bat habitats. Overall, a good spatial spread of the site was achieved. 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). Tables 3-2 to 3-5 summarise survey efforts achieved in 2020 and 2022 for each of the 18 and 15 no. detector locations respectively. Figures 3-7 and 3-8 show static detector locations for 2020 and 2022.

2020 Static Detectors

Automated bat detectors were deployed at 18 no. locations for at least 10 nights in each of spring (April-May), summer (June-mid August) and autumn (mid-August-October) 2020. Detector locations achieved a representative spatial spread of the study area and sampled the range of available habitats.

ID	Location (ITM)	Habitat	Linear Feature within 50m
D01	665696 753427	Cutover bog, birch forest edge	Birch Forest
D02	664368 752788	Cutover bog, birch forest edge	Birch Forest
D03	665454 752534	Within cutover bog, edge of heather beside rail tracks	Treelines
D04	664723 753136	Beside birch trees and heather, cutover bog	Treelines
D05	665167 751925	Beside willow between heather and mature birch scrub	Treelines
D06	665697 755287	Cutover bog edge with heather and birch scrub	Scrub
D07	664349 755108	Edge of birch/willow in bog bramble	Treelines
D08	660672 756989	Heather along train track	Scrub
D09	663384 758116	Beside track, open cutover bog and birch scrub	Scrub
D10	662221 756738	Cutover bog/heath beside willow drain to north	Scrub/ Eroding upland river
D11	663810 757238	Beside rail track birch wood edge	Treelines
D12	662808 756980	Molinia beside gorse bush and heather	Scrub
D13	665120 759482	Along rail track/birch forest linear	Treelines

Table 3-2 2020 Ground-level Static Detector Locations



D14	662439	Along cutover bog edge-gorse and heather along	Scrub/ Eroding upland
	758957	drain	river
D15	665539	Cutover bog, gorse and heather alder scrub	Scrub
	758542		
D16	664281	Cutover bog edge beside riparian vegetation on	Eroding upland river/
	759084	drain	Riparian woodland
D17	665207	Beside birch tree between heather scrub	Treelines/ Scrub
	758989		
D18	665696	Beside trees adjacent to river, beside gravel road	Riparian woodland/
	753427		Treelines

Table 3-3 2020 Survey Effort - Ground-level Static Surveys

Season	Survey Period	Total Survey Nights	Nights with
		per Detector Location	Appropriate Weather
Spring	23 rd April – 6 th May 2020	14	14
Summer	4 th June – 16 th June 2020	12	12
Autumn	3 rd September – 14 th September 2020	11	11
Total Surv	rey Effort	37	37

2022 Static Detectors

Automated bat detectors were deployed at 15 no. locations for at least 10 nights in each of spring (April-May), 20 nights of summer (June-mid August) and autumn (mid-August-October) 2022. Detector locations achieved a representative spatial spread of the study area and sampled the range of available habitats. One detector (D10) was redeployed on 26th April 2022 following technical difficulties with the original SD cards, to ensure a full dataset. The redeployed detector was collected on 10th May 2022. One detector (D07) did not record data in autumn 2022.

ID	Location (ITM)	Habitat	Linear Feature
			wiumi 50m
D01	665161 753511	Scrub	Scrub
D02	665988 752966	Scrub	Scrub
D03	665928 751691	Cutover Bog	Scrub
D04	663783 752452	Scrub	Scrub
D05	665231 752586	Cutover Bog	Scrub
D06	664616 752002	Scrub	Scrub
D07*	664329 753720	Cutover Bog	Scrub
D08	663741 757005	Scrub	Scrub
D09	662766 757322	Dry Silicious Heath	Scrub
D10	661509 757054	Dry Silicious Heath	Scrub
D11	664025 759551	Dry Silicious Heath	Scrub
D12	665118 758518	Cutover Bog	Scrub
D13	665850 758649	Dry Silicious Heath	Scrub
D14	665471 759851	Dry Silicious Heath	Scrub
D15	665033 759184	Cutover Bog	Scrub

Table 3-4 2022 Ground-level Static Detector Locations

*Due to a technical fault, no data was recorded at D07 in autumn 2022.

Table 3-5 2022 Survey Effort - Ground-level Static Surveys

Season	Survey Period	Total Survey Nights per Detector Location	Nights with Appropriate Weather
Spring	8 th April – 26 th April 2022	18	10
Summer	20 th June – 19 th July 2022	29	21
Autumn	5 th October – 25 th October	21	14



Total Survey Effort	58	45







3.2.4 Static Surveys at Height

Monitoring at height can provide useful information on bat activity. Simultaneous surveying at ground level and at height was undertaken throughout 2020. One Song Meter SM3BAT (Wildlife Acoustics, Maynard, MA, USA) was installed on a meteorological mast within the site (Grid Ref: E264783 N258983). The detector was equipped with two microphones; one at ground level and one at height (approx. 98 m above ground level) to allow for simultaneous surveying. Table 3-6 describes survey effort in relation to surveys at height and the location of the met mast is illustrated in Figure 3-7.

D	Survey Period	Total Survey Nights
Deployment - 1	20 th July – 5 th August 2020	17
Deployment - 2	7 th August – 21 st August 2020	15
Deployment - 3	3 rd September – 13 th September 2020	10
Total Survey Effort		42

Table 3-6 2020 Survey Effort - Static Surveys at Height

3.3 Bat Call Analysis

All recordings from 2020 and 2022 were later analysed using bat call analysis software Kaleidoscope Pro v.5.1.9 and 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, 2016). 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)

3.4 Limitations

A comprehensive suite of bat surveys has been undertaken at the Study Area in 2020 and 2022. 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, 2016) 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.

4. **RESULTS**

4.1 **Desk Study**

4.1.1 Bat Database Records

National Biodiversity Data Centre

The National Bat Database of Ireland was searched for records of bat activity and roosts within 10km of the Study Area (last search 09/07/2024). Hectads N65, N66 and N55 lie within 10km of the Study Area. Five of Ireland's nine resident bat species were recorded within 10km of the Study Area. The results of the database search are provided in Table 4-1.

Hectad	Species	Database	Designation
N55, N65	Common pipistrelle <i>Pipistrellus pipistrellus</i>	National Bat Database of Ireland	HD Annex IV, WA
N55, N65, N66	Leisler's bat <i>Nyctalus leisleri</i>	National Bat Database of Ireland	HD Annex IV, WA
N55, N65, N66	Brown long-eared bat <i>Plecotus auritus</i>	National Bat Database of Ireland	HD Annex IV, WA
N55, N66	Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	National Bat Database of Ireland	HD Annex IV, WA
N55, N66	Daubenton's Bat Myotis daubentonii	National Bat Database of Ireland	HD Annex IV, WA

Table 4-1 NBDC Bat Records within 10km of Study Area

Bat Conservation Ireland

Based on the size of the site, two searches were made with Bat Conservation Ireland. Records were received on 3rd March 2022 (Table 4-2). Searches were carried out within a 1km and 10km radius of the northern section of the study area (IG Ref: E 263983 N 259683) and southern section of the Study Area (IG Ref: E 265634 N 251541). The search yielded no results of roosts within a 1km radius of the site.



Northern Section	on of the Study Area (IG Ref: E 263983 N 259683)			
Record	Species	Grid Reference	Date	Location
	Plecotus auritus	N6854	N/A	Ballivor, Co. Meath
Roost	Pipistrellus pygmaeus	N6568	N/A	Clonmellon, Castlepollard, County Westmeath
	Plecotus auritus	N7258	N/A	Kildalkey, County Meath
	Plecotus auritus	N5651	N/A	Killucan, Mullingar, County Westmeath
	Plecotus auritus	N5458	N/A	Castlepollard, County Westmeath
	<i>Myotis daubentonii</i> , Unidentified bat, <i>Pipistrellus pygmaeus, Pipistrellus pipistrellus</i> (45kHz)	N7202163568	N/A	Athboy Bridge Transect
	Unidentified bat, Myotis daubentonii	N7145364744	N/A	Athboy Bridge Transect spot 1
	Myotis daubentonii, Unidentified bat	N7197763830	N/A	Athboy Bridge Transect spot 10
	Myotis daubentonii, Unidentified bat	N7194263934	N/A	Athboy Bridge Transect spot 2
	Myotis daubentonii, Unidentified bat	N7191864026	N/A	Athboy Bridge Transect spot 3
	Myotis daubentonii, Unidentified bat	N7182964149	N/A	Athboy Bridge Transect spot 4
	Myotis daubentonii, Unidentified bat	N7169164250	N/A	Athboy Bridge Transect spot 5
	Myotis daubentonii	N7159764384	N/A	Athboy Bridge Transect spot 6
	Myotis daubentonii, Unidentified bat	N7152464653	N/A	Athboy Bridge Transect spot 7
	Myotis daubentonii, Unidentified bat	N7148964653	N/A	Athboy Bridge Transect spot 8
Transact	Unidentified bat, Myotis daubentonii, Nyctalus leisleri	N6430061900	N/A	Athboy Bridge Transect spot 9
Tanseet	Myotis daubentonii, Unidentified bat	N592498	N/A	Coxtown Transect
	Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz), Nyctalus leisleri	N7339569390	N/A	DArcys Bridge Transect
	Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz), Nyctalus leisleri	N7357764382	N/A	N74 (3) 2006-
	Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Unidentified bat	N7327557662	N/A	N74 (4) 2006-
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Pipistrellus spp. (45kHz/55kHz)	N7332753266	N/A	N74 (5) 2006-
	Pipistrellus pygmaeus, Nyctalus leisleri, Pipistrellus pipistrellus (45kHz), Pipistrellus nathusii, Pipistrellus spp. (45kHz/55kHz), Unidentified bat	N734526	N/A	N74 (6) 2006-
	Myotis daubentonii, Unidentified bat	N7145364744	N/A	Scarrif Bridge (Meath) Transect
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri	N6864654122	23/08/2018	Consultancy Surveys



	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Myotis spp.	N6772154194	23/08/2018	Consultancy Surveys
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N6841754164	23/08/2018	Consultancy Surveys
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri	N6844254095	23/08/2018	Consultancy Surveys
	Myotis daubentonii	N710564	11/10/2009	BATLAS 2010
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N716642	20/09/2009	BATLAS 2010
	Pipistrellus pygmaeus, Myotis daubentonii	N708667	20/09/2009	BATLAS 2010
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N736676	20/09/2009	BATLAS 2010
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Myotis daubentonii	N6552161153	13/07/2017	BATLAS 2010
	Myotis daubentonii	N5851549989	25/09/2015	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Pipistrellus spp. (45kHz/55kHz)	N5796050836	25/09/2015	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Myotis spp.	N5438552353	18/08/2015	BATLAS 2020
	Pipistrellus pygmaeus, Myotis daubentonii	N6003253032	15/08/2016	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N6331053309	15/08/2016	BATLAS 2020
Ad-Hoc	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Pipistrellus spp. (45kHz/55kHz)	N5652353332	18/09/2015	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Plecotus auritus, Myotis spp.	N6785054205	21/09/2018	BATLAS 2020
	Nyctalus leisleri	N6171854227	16/08/2016	BATLAS 2020
	Pipistrellus pygmaeus	N6591454415	21/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N5453355765	30/09/2015	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N6084555945	27/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus nathusii	N6934556105	21/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz)	N5546856382	26/09/2015	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Plecotus auritus, Myotis spp.	N6520457382	22/09/2018	BATLAS 2020
	Pipistrellus pygmaeus, Nyctalus leisleri	N5845357619	26/09/2015	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri	N6255858610	22/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N7073959394	20/08/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Myotis daubentonii, Myotis spp.	N5781059945	09/10/2015	BATLAS 2020
	Pipistrellus pipistrellus (45kHz)	N6473660827	13/07/2017	BATLAS 2020
	Pipistrellus pygmaeus, Myotis daubentonii	N5637162568	27/06/2017	BATLAS 2020



	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Myotis daubentonii	N6204462577	13/07/2017	BATLAS 2020
	Pipistrellus pipistrellus (45kHz)	N5676363989	27/06/2017	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Myotis daubentonii, Plecotus auritus	N7168664269	19/08/2018	BATLAS 2020
	Pipistrellus pygmaeus	N6571264430	13/07/2017	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N5580865499	27/06/2017	BATLAS 2020
	Pipistrellus pygmaeus, Pipistrellus spp. (45kHz/55kHz)	N6139866125	14/07/2017	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri	N7075266653	19/08/2018	BATLAS 2020
	Pipistrellus pygmaeus, Pipistrellus spp. (45kHz/55kHz)	N6228467284	14/07/2017	BATLAS 2020
	Pipistrellus pygmaeus, Myotis daubentonii	N6748069165	13/07/2017	BATLAS 2020
	Pipistrellus pipistrellus (45kHz)	N6632869554	14/07/2017	BATLAS 2020
	Plecotus auritus	N684653	17/07/2005	Consultancy Surveys
	Nyctalus leisleri, Pipistrellus pipistrellus (45kHz)	N6800054000	27/06/2007	Brown long-eared Roost Monitoring Scheme
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Plecotus auritus	N5485065500	20/05/2003	Consultancy Surveys
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Plecotus auritus, Nyctalus leisleri	N5680051850	06/09/2007	Consultancy Surveys
	Myotis natterreri, Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri	N7109358118	26/03/2012	Consultancy Surveys
Southern Section of	the Study area (IG Ref: E 265634 N 251541)			
Record	Species	Grid Reference	Date	Location
	Nyctalus leisleri, Pipistrellus spp. (45kHz/55kHz)	N7313742708	N/A	Enfield, County Meath
	Plecotus auritus	N6854	N/A	Ballivor, Co. Meath
	Pipistrellus pygmaeus	N7551	N/A	Doolystown, Trim, County Meath
Roost	Pipistrellus spp. (45kHz/55kHz)	N6844	N/A	Ballynakill, Longwood, County Meath
	Pipistrellus pygmaeus	N6849	N/A	Killyon, County Meath
	Plecotus auritus	N5743	N/A	Kinnegad, County Meath
	Plecotus auritus	N7258	N/A	Kildalkey,County Meath
	Plecotus auritus	N5651	N/A	Killucan, Mullingar, County Westmeath
	Unidentified bat	N6087346115	N/A	Ballivor Road Bridge Transect spot 1
Transect	Unidentified bat	N6077245970	N/A	Ballivor Road Bridge Transect spot 3
	Unidentified bat,Myotis daubentonii	N6071345902	N/A	Ballivor Road Bridge Transect spot 4



	Myotis daubentonii,Unidentified bat	N6064245796	N/A	Ballivor Road Bridge Transect spot 5
	Myotis daubentonii	N6010045717	N/A	Ballivor Road Bridge Transect spot 6
	Myotis daubentonii,Unidentified bat	N592498	N/A	DArcys Bridge Transect
	Unidentified bat,Myotis daubentonii	N7220042600	N/A	Moyvalley Bridge Transect
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Pipistrellus spp. (45kHz/55kHz)	N7327557662	N/A	N74 (5) 2006-
	Pipistrellus pygmaeus, Nyctalus leisleri, Pipistrellus pipistrellus (45kHz), Pipistrellus nathusii, Pipistrellus spp. (45kHz/55kHz), Unidentified bat	N7332753266	N/A	N74 (6) 2006-
	Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Plecotus auritus, Unidentified bat	N7559147955	N/A	N74 (8) 2006-
	Pipistrellus spp. (45kHz/55kHz), Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri	N7273944501	N/A	N74 (9) 2006-
	Myotis daubentonii, Unidentified bat	N734526	N/A	Scarrif Bridge (Meath) Transect
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri	N6864654122	23/08/2018	Consultancy Surveys
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Myotis spp.	N6772154194	23/08/2018	Consultancy Surveys
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N6841754164	23/08/2018	Consultancy Surveys
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri	N6844254095	23/08/2018	Consultancy Surveys
	Myotis daubentonii	N710564	11/10/2009	BATLAS 2010
	Pipistrellus pygmaeus, Pipistrellus pipistrellus (45kHz)	N7562957770	11/10/2009	BATLAS 2010
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Myotis daubentonii	N6552161153	13/07/2017	BATLAS 2010
	Pipistrellus pygmaeus, Nyctalus leisleri	N7371442396	23/08/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N5785742916	11/09/2018	BATLAS 2020
Ad-Hoc	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri	N7183143465	26/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Myotis spp.	N6262544714	12/09/2018	BATLAS 2020
	Pipistrellus pygmaeus, Pipistrellus spp. (45kHz/55kHz)	N7231645158	23/08/2018	BATLAS 2020
	Pipistrellus spp. (45kHz/55kHz)	N7557245429	23/08/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N6476647081	29/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N6113149273	29/09/2018	BATLAS 2020
	Pipistrellus pygmaeus, Plecotus auritus	N5972949371	29/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Myotis daubentonii	N6637349447	29/09/2018	BATLAS 2020
	Myotis daubentonii	N5851549989	25/09/2015	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Pipistrellus spp. (45kHz/55kHz)	N5796050836	25/09/2015	BATLAS 2020
	Pipistrellus pygmaeus, Myotis daubentonii	N6003253032	15/08/2016	BATLAS 2020



Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N6331053309	15/08/2016	BATLAS 2020
Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Pipistrellus spp. (45kHz/55kHz)	N5652353332	18/09/2015	BATLAS 2020
Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Plecotus auritus, Myotis spp.	N6785054205	21/09/2018	BATLAS 2020
Nyctalus leisleri	N6171854227	16/08/2016	BATLAS 2020
Pipistrellus pygmaeus	N6591454415	21/09/2018	BATLAS 2020
Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N6084555945	27/09/2018	BATLAS 2020
Pipistrellus pipistrellus (45kHz), Pipistrellus nathusii	N6934556105	21/09/2018	BATLAS 2020
Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Plecotus auritus, Myotis spp.	N6520457382	22/09/2018	BATLAS 2020
Pipistrellus pygmaeus, Nyctalus leisleri	N5845357619	26/09/2015	BATLAS 2020
Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Myotis daubentonii, Plecotus auritus	N7550957732	20/08/2018	BATLAS 2020
Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri	N6255858610	22/09/2018	BATLAS 2020
Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N7073959394	20/08/2018	BATLAS 2020
Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Myotis daubentonii, Myotis spp.	N5781059945	09/10/2015	BATLAS 2020
Pipistrellus pipistrellus (45kHz)	N6473660827	13/07/2017	BATLAS 2020
Nyctalus leisleri, Pipistrellus pipistrellus (4.5kHz)	N6800054000	27/06/2007	Brown long-eared Roost Monitoring Scheme
Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Plecotus auritus, Nyctalus leisleri	N5680051850	06/09/2007	Consultancy Surveys
Myotis natterreri, Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri	N7109358118	26/03/2012	Consultancy Surveys
Pipistrellus pipistrellus (45kHz)	N5800048000	23/06/2002	Consultancy Surveys
Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Myotis daubentonii	N5800049000	23/06/2002	Consultancy Surveys
Nyctalus leisleri, Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	N572432	13/06/2000	Consultancy Surveys

Table 4-2 BCI Database Records



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 Study Area is located outside the current known range for lesser horseshoe bat, Nathusius' pipistrelle, Natterer's bat and Whiskered bat. The Study Area is within the range of 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 Study Area is situated outside the 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 NHAs and pNHAs within a 10km radius of the Study Area found no sites designated for the conservation of bats.

4.1.4 Landscape Features

A review of mapping and photographs provided insight into the habitats and landscape features present within the Study area. In summary, the primary land use within the Study Area was commercial peat harvesting which ceased operation in 2020.

A review of the GSI online mapper did not indicate the possible presence of any natural subterranean sites within the Study area and a search of the National Monuments Database did not reveal the presence of any manmade subterranean sites within the Study Area.

A search of the UBSS Cave Database for the Republic of Ireland found no caves within the Study Area study area or within 10km of the Study Area.

A review of the NBDC bat landscape map provided a habitat suitability index of 16.67 (green) to 21.89 (yellow). This indicates that the Study Area has low habitat suitability for bat species.

4.2 Field Surveys

4.2.1 Roost Surveys

The Study Area was checked for potential tree roosts but no trees with significant roosting features were identified within the site. Trees may have an increased or decreased probability of hosting roosting bats in certain circumstances. For example, a large broadleaf tree with cavities or damage such as rot or loose bark increases the probability of hosting roosting bats. Whereas coniferous plantations and young trees with little to no damage have a decreased probability of hosting roosting bats (Marnell *et al.*, 2022). The surrounding habitats, i.e. cutover bog and scrub, were assessed as largely unsuitable for roosting bats.

Following a search for roosts in 2020 and 2022, no evidence of bat roosts were identified within the Study Area.



4.2.2 Manual Transects

2020 Manual Results

Manual transects were undertaken in Spring, Summer and Autumn 2020. Bat activity was recorded on all surveys. A total of 535 bat passes were recorded. In general, Common pipistrelle (*Pipistrellus pipistrellus*) (n=230) was recorded most frequently, followed by Soprano pipistrelle (*Pipistrellus pygmaeus*) (n=169), and Leisler's Bat (*Nyctalus leisleri*) (n=132). Instances of Brown long-eared bat (*Plecotus auritus*) (n=3) and *Myotis* spp. (n=1) were rare.

Species composition and activity levels varied significantly between surveys. Transect survey results were calculated as bat passes per km surveyed (to account for differences in survey effort) (Plate 4-1).

Figures 4-1 to 4-3 present the spatial distribution of bat activity across the 2020 surveys. Bat activity was concentrated along woodland edge, scrub and linear (road/track) habitats.



Plate 4-1 2022 Manual Activity Surveys (Total Species Composition)



Plate 4-2 2020 Transect Results - Species Composition Per Survey Period









2022 Manual Results

Manual transects were undertaken in Spring, Summer, and Autumn 2022. Bat activity was recorded on all surveys. A total of 108 bat passes were recorded. In general, Common pipistrelle (*Pipistrellus pipistrellus*) (n=96) was recorded most frequently, followed the Leisler's bat (*Nyctalus leisleri*) (n=8), and Soprano pipistrelle (*Pipistrellus pygmaeus*) (n=4).



Plate 4-3 2022 Manual Activity Surveys (Total Species Composition)

Species composition and activity levels varied slightly between surveys, but for all surveys, species activity was relatively low. Plate 4-3 presents the results for individual species per survey period. Transect survey results were calculated as bat passes per km surveyed (to account for differences in survey effort) (Plate 4-4). Figure 4-4 to Figure 4-6 present the seasonal distribution of bat activity across the 2022 surveys. Bat activity was concentrated along linear habitats such as forestry edge, scrub and roads/tracks.



Plate 4-4 2022 Transect Results - Species Composition Per Survey Period









4.2.3 Ground-level Static Surveys

2020 Static Results

In total, 96,711 bat passes were recorded across all deployments. In general, Common pipistrelle (*Pipistrellus pipistrellus*) (n=61,883) occurred most frequently, followed by Soprano pipistrelle (*Pipistrellus pygmaeus*) (n=18,637), and Leisler's bat (*Nyctalus leisleri*) (n=12,712). Instances of Nathusius' pipistrelle (*Pipistrellus nathusii*) (n=2,360), *Myotis* spp. (n=696) and Brown long-eared bat (*Plecotus auritus*) (n=423) were significantly less. Plate 4-5 presents species composition across all ground-level static detectors.



Plate 4-5 2020 Static Detector Surveys: Species Composition Across All Deployments (Total Bat Passes)

Bat activity was calculated as total bat passes per hour (bpph) per season to account for any bias in survey effort, resulting from varying night lengths between seasons. Plate 4-6 and Table 4-3 presents these results for each species. Bat activity was dominated by Common pipistrelle in spring and summer Soprano pipistrelle was more common in autumn. Instances of Leisler's bat were less frequent. Nathusius' pipistrelle, *Myotis* spp. and Brown long-eared bat and were relatively rare.



Plate 4-6 2020 Static Detector Surveys: Species Composition Across All Deployments (Total Bat Passes Per Hour, All Nights)



Table 4-3 Static Detector Surveys: Species Composition Across All Deployments in 2020 (Total Bat Passes Per Hour, All Nights)

	Spring	Summer	Autumn
Total Survey Hours	143.7	92	140.9
Myotis spp.	1.16	1.43	2.82
Leisler's bat	40.65	55.41	12.58
Nathusius' pipistrelle	6.70	15.10	0.06
Common pipistrelle	178.10	321.01	47.96
Soprano pipistrelle	51.23	27.91	61.80
Proum long cored hot	0.02	0.41	1 70
brown long-eared bat	0.93	0.41	1.79

Plate 4-7 illustrates the total bat passes per species per deployment. Common pipistrelle bats were predominant at the majority of detectors during the Spring and Summer survey periods. Autumn activity varied at each detector with Soprano pipistrelle, Common pipistrelle and Leisler's bat as the dominant species.



Extraction in the Ballivor Bog Group, Co. Meath & WestmeathExtraction in the Ballivor Bog Group, Co. Meath & Westmeath Appendix 6-2 Bat Survey Report



Plate 4-7 Total Bat Passes Per Detector - 2020



2022 Static Results

In total, 44,221 bat passes were recorded across all deployments in 2022. In general, Common pipistrelle (*Pipistrellus pipistrellus*) (n=24,758) occurred most frequently, followed by Soprano pipistrelle (*Pipistrellus pygmaeus*) (n=11,882), and Leisler's bat (*Nyctalus leisleri*) (n=6,730). Instances of Myotis spp. (n=645), Brown long-eared bat (*Plecotus auritus*) (n=192) and Nathusius' pipistrelle (*Pipistrellus nathusii*) (n=14) were significantly less. Plate 4-8 presents species composition across all ground-level static detectors.



Plate 4-8 2022 Static Detector Surveys: Species Composition Across All Deployments (Total Bat Passes)

Bat activity was calculated as total bat passes per hour (bpph) per season to account for any bias in survey effort, resulting from varying night lengths between seasons. Plate 4-9 and Table 4-4 presents these results for each species. Bat activity was dominated by Common pipistrelle in summer. Soprano pipistrelle was more common in spring and autumn. Instances of Leisler's bat were less frequent. *Myotis* spp., Brown long-eared bat and Nathusius' pipistrelle, and were relatively rare.



Plate 4-9 2022 Static Detector Surveys: Species Composition Across All Deployments (Total Bat Passes Per Hour, All Nights)



	Spring	Summer	Autumn
Total Survey Hours	187.5	214.9	280.7
Myotis spp.	0.89	0.98	0.96
Leisler's bat	9.99	21.79	0.62
Nathusius' pipistrelle	0.02	0.05	0.00
Common pipistrelle	10.29	104.81	1.08
Soprano pipistrelle	17.40	36.40	2.84
Brown long-eared bat	0.07	0.41	0.32

Table 4-4 Static Detector Surveys: Species Composition Across All Deployments in 2022 (Total Bat Passes Per Hour, All Nights)

Plate 4-10 illustrates the total bat passes per species per deployment. Activity is variable between survey nights. Common pipistrelle bats were predominant at the majority of detectors during the summer survey period. Spring and autumn activity varied at each detector with Soprano pipistrelle, Common pipistrelle and Leisler's bat as the dominant species.





Plate 4-10 Total Bat Passes Per Detector - 2022



4.2.4 Static Surveys at Height - 2020

Simultaneous surveying at ground level and at height was undertaken using a SM3 static bat detector. One U1 microphone was attached at height (approx. 98m) on the meteorological mast (Grid Ref: N 64762 58978) while another U1 microphone was placed 2m from ground level.

In 2020, 42 nights of simultaneous bat monitoring at ground level and at height was achieved. In total, 1,339 bat passes were recorded with bat activity higher at ground level (69%) compared to activity at height (31%) (Plate 4-11). Leisler's bats (n=409) were predominantly recorded at height with small numbers of common pipistrelle (n=9) also present. *Myotis* spp. (n=1) and soprano pipistrelle (n=1) were also recorded at height.



Plate 4-11 Surveys at Height 2020: Overall Species Composition Per Microphone

Table 4-5 presents met mast monitoring as total bat passes. Plate 4-12 presents total bat passes per night. Activity was dominated by Leisler's bat.

Species	Ground Level	At Height	Total
Myotis spp.	17	1	18
Leisler's bat	561	409	970
Common pipistrelle	174	9	183
Soprano pipistrelle	132	1	133
Brown long-eared bat	35	-	35
Total	919	420	1339

Table 4-5 Static Detector Surveys at Height: 2020 Total Bat Passes





Plate 4-12 Surveys at Height: Overall Species Composition Per Microphone



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 Study Area. Bats as an Ecological Receptor have been assigned *Local Importance (Higher value)* on the basis that the habitats within the Study Area are utilized by a regularly occurring bat population of Local Importance.

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



5. **OVERALL FINDINGS**

Six bat species were recorded across the site in both 2020 and 2022. 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 site in 2020 or 2022, and the site overall provides suboptimal roosting opportunities. Trees on site comprised a mix of immature, semi-mature and mature broadleaf and conifer species. 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 and all ancillary works, 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 extraction. 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.

This report provides a full and comprehensive assessment of baseline bat activity within the site in 2020 and 2022. The surveys and results provided in this report are in accordance with the relevant industry guidance.



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