

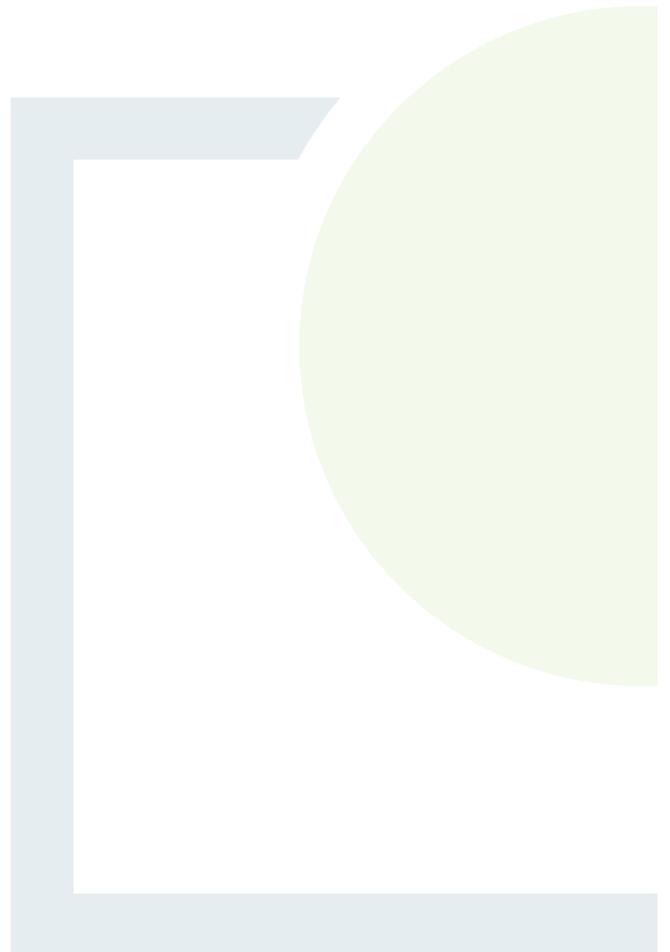


**FEHILY
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**CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING**

APPENDIX 5.1

Bat Roost Survey Report



Bat Roost Survey

Barnadivane Wind Farm and Substation

Barnadivane

Macroom

Co. Cork

Report, prepared for Fehily Timoney & Co.

By Karen Banks MCIEEM

8th November 2022



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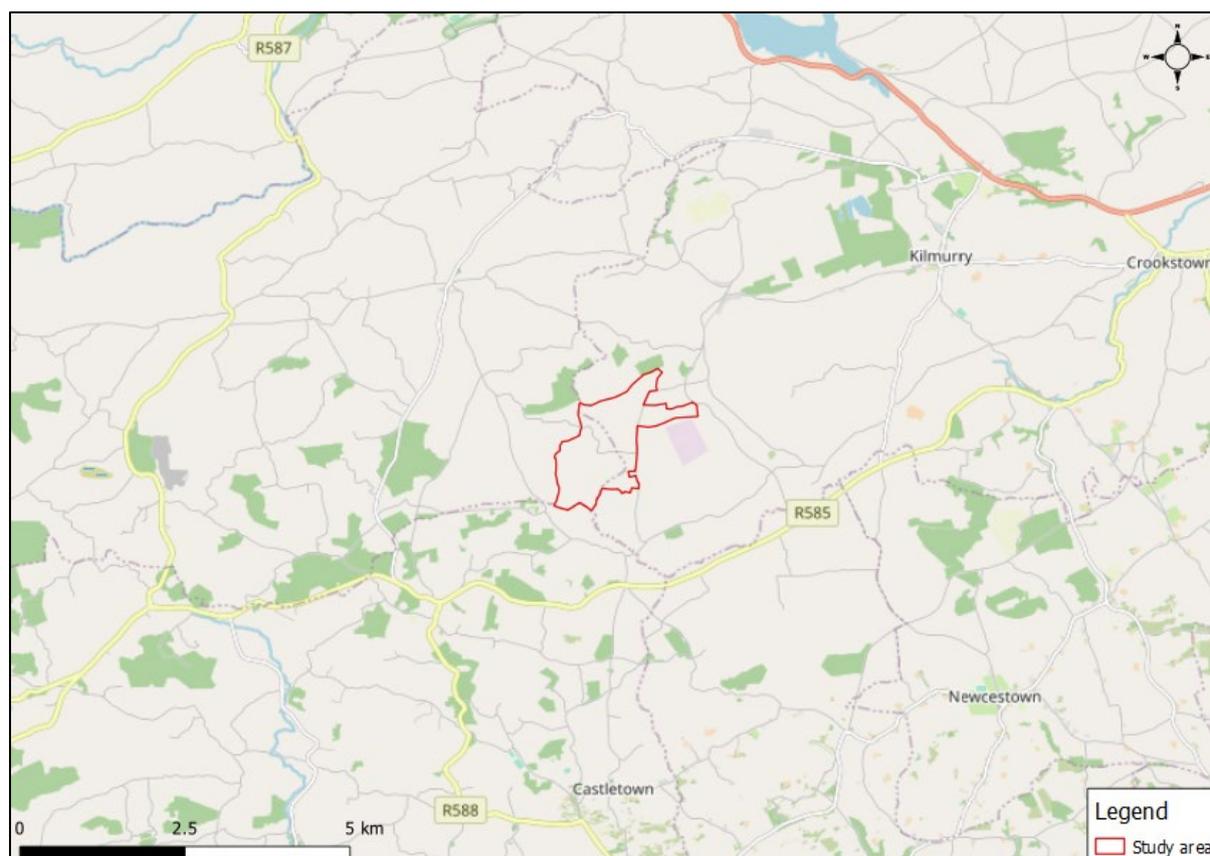
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1 Introduction

Greenleaf Ecology was commissioned by Fehily Timoney to undertake bat roost surveys of the Proposed Wind Farm and Substation ‘the Proposed Development’ located in the townlands of Lackareagh, Garranereagh and Barnadivane Co. Cork.

The Study Area comprises the land ownership boundary; the proposed site is located within the Study Area (as detailed in the EIAR prepared for the Proposed Wind Farm). The location of the wind farm Study Area is illustrated in Figure 1-1.

Figure 1-1: Study Area location



1.1 Proposed Works

For a description of the Proposed Development please refer to Chapter 2 of the EIAR prepared for the Proposed Wind Farm and Substation.

1.2 Legislative Context

All Irish bats are protected under the Wildlife Acts. Also, the EU Habitats Directive, and Irish implementing legislation, seeks to protect rare species, including bats, and their habitats, and requires that appropriate monitoring of populations be undertaken. Moreover, the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) exists to conserve all bat species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) protects migrant bat species across all European boundaries. Ireland has ratified both these conventions.

All bats are listed in Annex IV to the Habitats Directive (92/43/EC) and the Lesser Horseshoe bat is further listed under Annex II to the same Directive.

Destruction, alteration or evacuation of a known bat roost is a notifiable action under current legislation and a derogation licence has to be obtained from the National Parks and Wildlife Service (NPWS) before works can commence. Any works interfering with bats and especially their roosts, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by the NPWS. The details with regards to Appropriate Assessments, the strict parameters within which derogation licences may be issued and the procedures by which and the order in relation to the planning and development regulations such licences should be obtained, are set out in Circular Letter NPWS 2/07 "*Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 - strict protection of certain species/applications for derogation licences*".

1.3 Objectives

The objectives of the bat surveys were to assess:

- Whether actual or potential bat roosts are present, and if so where;
- What species of bat use the Study Area for roosting;
- How many bats do these roosts support; and
- What types of bat roost are present.

2 Methodology

2.1 Desk Study

A pre-survey data search was conducted in order to collate existing information from the Study Area and the surrounding area on bat activity, roosts and landscape features that may be used by bats. The data search comprised the following information sources:

- Collation of known bat records within a 4km radius¹ of the Study Area from the National Bat Database held by the National Biodiversity Data Centre (www.biodiversityireland.ie);
- Review of Ordnance Survey mapping and aerial photography of the Study Area and its environs (i.e. 200m plus rotor radius of the boundary of the Study Area²);
- Records of designated sites within a 15km radius of the Study Area where bats form part or all of the reason for designation (<https://www.npws.ie/protected-sites>);
- Collation of lesser horseshoe bat records within a 4km radius of the Study Area from the National Parks and Wildlife Service lesser horseshoe bat database (<https://www.npws.ie>);
- Collation of data on known caves within a 4km radius of the Study Area from the Cave Database for the Republic of Ireland, compiled by Trinity College (http://www.ubss.org.uk/search_irishcaves.php); and
- Review of bat survey data from Ecological Impact Assessments from proposed and permitted developments within the wider environs of the Study Area.

2.2 Field Survey

This bat survey and assessment was undertaken in accordance with the following guidelines:-

- Andrews, H. (2018) *Bat Roosts in Trees. A guide to identification and assessment for tree-care and ecology professionals.* Pelagic Publishing.
- Bat Conservation Ireland (2010) *Guidance notes for Planners, Engineers, Architects, and Developers;*
- Collins, J. (ed.) (2016) *Bat Surveys for Professional ecologists: Good Practice Guidelines (3rd ed.).* The Bat Conservation Trust, London;
- Marnell, F., Kelleher, C. & Mullen, E. (2022) *Bat mitigation guidelines for Ireland v2.* Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland; and
- Scottish Natural Heritage (2021) *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation.* Scottish Natural Heritage.

2.2.1 Surveyor Information

The survey was undertaken by Karen Banks, MCIEEM.

Karen is an ecologist with 16 years' experience in the field of ecological assessment. She holds a BSc in Environment and Development from Durham University and is a full member of the Chartered Institute of Ecology and Environmental Management. Karen is an experienced and skilled bat surveyor, first gaining a scientific licence to disturb bats from Natural England, UK in 2008. Karen is trained in bat handling and capture methods and currently holds a bat disturbance licence granted by the NPWS. Karen has undertaken bat survey and assessment for numerous projects, including bridge repair and

¹ A 4km radius search distance was selected to encompass records of bat roosts within Core Sustainance Zones (CSZ) of the Study Area for Irish species of bat. A CSZ refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the conservation status of the colony using the roost (Collins, 2016).

² As per SNH (2019)

replacement works, domestic dwelling repair and demolition works, wind farm developments and large-scale infrastructure projects such as flood relief schemes, road developments and pipeline schemes. Karen has also represented Cork County Council as an expert witness for bats at an Oral Hearing.

2.2.2 Bat Roost Survey

2.2.2.1 Preliminary Ecological Appraisal

A walkover survey of areas identified as potential roosting habitats during the desk top study was undertaken in June 2021. Roosting habitat was assessed using the criteria outlined in Table 2-1³.

Table 2-1: Criteria for Assessing the Potential Suitability of the Study Area for Bats

Suitability	Description Roosting Habitats	Commuting and Foraging Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. 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). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only- the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

³ Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London

2.2.2.2 *Bat Roost Inspection Survey*

Trees

A detailed inspection of the exterior of trees within the Study Area was undertaken on 28th March 2022 to look for features that bats could use for roosting (Potential Roost Features, or PRFs) from ground level. The aim of the survey was to determine the actual or potential presence of bats and the need for further survey and/or mitigation.

A detailed inspection of each potential tree roost within the Study Area was undertaken. The inspection was carried out in daylight hours from ground level, and information was compiled on the tree, PRFs and evidence of bats. All trees surveyed were numbered and marked on a map and a description of each PRF observed was recorded. PRFs that may be used by bats include:

- Rot holes;
- Hazard beams;
- Other horizontal or vertical cracks or splits (e.g. frost cracks) in stems or branches;
- Lifting bark;
- Knotholes arising from naturally shed branches or branches previously pruned back to the branch collar;
- Man-made holes (e.g. flush cuts) or cavities created by branches tearing out from parent stems;
- Cankers in which cavities have developed;
- Other hollows or cavities;
- Double leaders forming compression forks with included bark and potential cavities;
- Gaps between overlapping stems or branches;
- Partially detached ivy with stem diameters in excess of 50mm; and
- Bat or bird boxes.

Signs of a bat roost (excluding the actual presence of bats), include:

- Bat droppings in, around or below a PRF;
- Odour emanating from a PRF;
- Audible squeaking at dusk or in warm weather; and
- Staining below the PRF.

It should be noted that bats or bat droppings are the only conclusive evidence of a roost and many roosts have no external signs. This survey and evaluation was undertaken by an experienced bat ecologist from ground level. Trees were categorised according to the highest suitability PRF present.

Structures

Buildings within the Proposed Wind Farm and Substation Study Area and buffer zone were subject to a visual inspection for evidence of, and potential for, bats in August 2021. The exterior of the structures was visually assessed for potential bat access points and evidence of bat activity using binoculars, a high-powered torch and an endoscope (Explorer Premium 8803 with 9mm camera). Features such as crevices and small gaps in the bridge or building structure, such as between the brick or stonework, beneath roofing material, at eaves and around window frames which had potential as bat access points into the buildings were inspected. Evidence that these features/ access points were actively being used by bats includes staining within the gaps, urine staining and bat droppings. Indicators that potential access points are not actively used by bats include general detritus and cobwebs within the access point. A note of potential features used by bats was made where present.

Where possible, internal inspections of these structures was undertaken. Where it was not possible to complete internal inspections, emergence roost surveys were completed, see section below. Internal inspections involved looking for features that may be suitable for roosting bats, such as joints and crevices in wood, holes or crevices between stonework in the walls and searching for bat droppings, urine stains and feeding signs on the floor.

2.2.2.3 Emergence Roost Survey

Dusk surveys of structures within the Study Area and its buffer that were identified as being of moderate to high potential for bats during the roost inspection surveys were undertaken between 27th August and 31st August 2021 and 22nd August 2022 and 26th August 2022. The purpose of the surveys was to watch and listen for bats exiting from bat roosts to determine the presence or absence of bats at the time of survey. The dusk emergence surveys commenced approximately 15 minutes before sunset and ended approximately 90 minutes after sunset. The survey was undertaken in suitable weather conditions (avoiding periods of very heavy rain, strong winds (> Beaufort Force 5), mists and dusk temperatures below (12°C)). Two people surveyed the structures (Karen Banks and Cathál MacPartholan).

Anabat Walkabout detectors were utilised for the survey, which record bat echolocation calls directly on to an internal SD memory card. Each time a bat is detected, an individual time-stamped (date and time to the second) file is recorded. Data were then downloaded and all recordings were analysed using the Anabat Insight spectrogram sound analysis software Version 2.0.1.

3 Results

3.1 Existing Bat Data

The review of existing records of bat species in the area of the site indicates that three of the ten known Irish species of bat have been recorded within a 4km radius of the Study Area, namely pipistrelle species, brown long-eared and lesser horseshoe bat, as shown in Table 3-1 below. Of these species, brown long-eared bat has been recorded roosting in a building located c.2.5km to the north of the Study Area, a building located c.4km to the east of the Study Area and also a building located c.4km to the south-east of the Study Area. Lesser horseshoe bat has been recorded roosting in a building located c.2km to the north of the Study Area and a building located c.4km to the north-east of the Study Area.

Table 3-1: NBDC and NPWS bat records within a 4km radius of the Study Area

Common Name	Scientific Name	Present (Y/N)	Date of Last Record	Location of Known Roost (to 1km OS Grid Square Resolution)
Pipistrelle spp.	<i>Pipistrellus pipistrellus sensu lato</i>	Y	04/05/2003	None
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>			
Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>			
Leisler's Bat	<i>Nyctalus leisleri</i>			
Brown Long-eared Bat	<i>Plecotus auritus</i>	Y	29/07/2001	W3466, W3865, W3862
Daubenton's Bat	<i>Myotis daubentonii</i>			
Whiskered Bat	<i>Myotis mystacinus</i>			
Natterer's Bat	<i>Myotis nattereri</i>			
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	Y	16/07/2013	W3466, W3766
Brandt's Bat	<i>Myotis brandtii</i>			

The bat landscape association model (Lundy *et al*, 2011) suggests that the Study Area is part of a landscape that is of moderate to high suitability for bats including common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle, brown long-eared, Leisler's and natterer's bat; and low to moderate suitability for lesser horseshoe, whiskered bat, Daubenton's bat and Nathusius' pipistrelle. Overall, the Study Area and its surrounding landscape is considered to be of low to moderate suitability for bats.

The Cave Database for the Republic of Ireland does not hold any records of caves within a 4km radius of the Study Area.

The bat assessment undertaken for the Proposed Wind Farm in 2014 recorded bats most frequently along hedgerows, treelines and earth banks at lower elevations. Common and soprano pipistrelle, natterer's Daubenton' and Leisler's bat were recorded foraging within the Study Area. A brown long-eared bat roost was recorded within a farm building on the eastern boundary of the Study Area and a potential common pipistrelle bat roost was recorded to the north of the Study Area.⁴

⁴Fehily Timoney (2014) Environmental Impact Statement for the Proposed Barnadivane Wind Farm, Co. Cork. Volume 3- Main EIS.

3.1.1 Designated Sites

There are no European sites within a 15km radius or nationally designated sites within a 10km radius of the Study Area which include bats as a Qualifying Interest (QI).

3.2 Bat Roost Survey

3.2.1 Preliminary Ecological Appraisal

Review of aerial photography indicates that the Proposed Development Study Area predominantly comprises improved agricultural grassland, with wet grassland to the west and south of the Study Area. The fields are generally bound by hedgerows and treelines; lines of conifer trees are also present. Conifer plantation is present on the northern and south-western boundaries of the Study Area.

The small 1st and 2nd order streams Moneygaff East, Bride (Cork) and Barnadivane (EPA names) are present along the boundaries to the south of the Study Area (Study Area illustrated in Figure 1-1).

The streams at the south of the Study Area, hedgerows, treelines and conifer plantation edges provide connectivity to other foraging areas in the wider landscape. The hedgerows and treelines within the Study Area provide sheltered areas for foraging bats, particularly in low lying areas. In accordance with the criteria outlined in Table 2-1, the commuting and foraging habitats over most of the Study Area are of moderate suitability for bats. A summary of foraging and roosting habitats for Irish bats is included in **Appendix A**.

3.2.2 Bat Roost Inspection Survey

3.2.2.1 Trees

No trees within the Study Area were confirmed as roost sites during the course of the survey undertaken in March 2022. A total of three trees within the Study Area were categorised as being of moderate suitability for roosting bats (as defined in Table 2-1) as they contained one or more potential roost features, but none are suitable for use by larger numbers of bats on a regular basis due to their size and lack of protected, sheltered conditions. A further three trees supporting Ivy growth that may have potential for individual/ small numbers of bats to roost opportunistically were recorded at the east of the Study Area; these trees are classified as being of low suitability to support roosting bats.

The location of the trees with suitability for roosting bats is illustrated in Figure 3-1 and detailed in Table 3-2.

Table 3-2: Proposed Wind Farm and Substation: potential tree roosts

PTR Number	Tree Species	BCT Category	PRFs
1	Ash	Moderate	2 large knot holes
2	Ash	Moderate	Large knot hole
3	Ash	Moderate	Large knot hole
4	Ash	Low	Ivy
5	Ash	Low	Ivy
6	Sycamore	Low	Ivy

Figure 3-1: Proposed Wind Farm and Substation: potential tree roosts



3.2.2.2 Structures

A total of six buildings/clusters of buildings were identified in the preliminary ecological appraisal as being of potential to support roosting bats. These are detailed in Table 3-3.

Table 3-3: Buildings with bat potential located within the Study Area and its environs

Building number and Grid Reference (ITM)	Description	Suitability to Support Roosting Bats
Building 1 Grid Ref: 534136,563990	A 2-storey disused dwelling with rendered walls and a slate roof. Potential entry points for bats were present via slipped tiles, raised ridge tiles, under chimney flashing, gaps between bricks in the chimney and gaps at the edge of a window.	Scattered bat droppings were recorded inside the dwelling and one dead Leisler's bat was present in a first floor room. The dwelling is of high suitability for bats (presence of bats confirmed).
Building 2 Grid Ref: 534595,562768	A 2-storey disused dwelling and attached outbuilding with rendered walls and a slate roof. Potential entry points for bats were present in the dwelling via a raised ridge tile and under chimney flashing. The outbuilding supported potential access for bats via slipped tiles.	Dwelling and outbuilding are potentially of moderate suitability for roosting bats based on the material of their construction, their state of repair and the presence of potential bat access points as viewed from the farmyard.
Building 3 Grid Ref: 533937,562817	Occupied dwelling. External inspection undertaken using binoculars. Two storey dwelling with slate roof. Roof in good repair. Agricultural outbuildings steel frame corrugated sheds.	Dwelling and outbuildings considered to be of low suitability for roosting bats in light of the material of their construction and state of repair as viewed from the farmyard.
Cluster of buildings 4 Grid Ref: 534730,563547	Disused dwelling and outbuildings in farmyard. External inspections undertaken from the farmyard & public road. 2-storey disused dwelling with rendered walls and a slate roof. Potential access via slipped tiles and under chimney flashing. Outbuilding constructed of stone with a slate roof; potential access via missing windows and door and gaps between stonework. Occupied dwelling to north of farmyard was a 2 storey modern building with a tile roof. Structure in good condition with no obvious entry/exit points for bats.	The disused dwelling is considered to be of moderate suitability for roosting bats based on the material of its construction, its state of repair and the presence of potential bat access points as viewed from the farmyard. The stone outbuilding is considered to be of low suitability for bats as it was open and relatively draughty and may be used by individual/ small numbers of bats but is unsuitable to support a roost of high conservation value. The occupied dwelling is considered to be of low suitability for roosting bats in light of the material of its construction and its state of repair based on observation from the public road.
Building 5 Grid Ref: 534838,563942	Old national school. Single storey stone building with rendered walls and slate roof. Potential access for bats via slipped tiles, open	Considered to be of moderate suitability for roosting bats based on the material of its construction, its state of repair and the presence

Building number and Grid Reference (ITM)	Description	Suitability to Support Roosting Bats
	windows and raised ridge tiles. Potential roosting space behind fascia boards and between roof tiles and ceiling boards.	of potential bat access points and roosting spaces.
Building 6 Grid Ref: 534962,563909	Occupied dwelling: two storey modern building with a tile roof in very good upkeep. No obvious entry/exit points for bats. External inspection undertaken from the public road. Agricultural outbuildings steel frame and corrugated sheds. One outbuilding was constructed of stone with a corrugated roof. Structure did not have windows or a door and was open and draughty.	Dwelling considered to be of low suitability for roosting bats in light of the material of its construction and its state of repair based on external inspection from within the Study Area using binoculars. Outbuildings of low suitability based on material of construction and state of repair.

3.2.3 Emergence Roost Survey

Emergence roost surveys were undertaken of structures within Study Area and accessible structures within the Study Area buffer that were of moderate to high suitability for roosting bats. The emergence surveys were undertaken by two surveyors in August 2021 and were repeated in August 2022.

Building 1

Emergence surveys were undertaken at Building 1 on 27th August 2021 and 23rd August 2022. In 2021, one Leisler's bat and five pipistrelle were recorded emerging from between stonework on the northern gable end and the bottom of the chimney. The pipistrelles comprised three soprano pipistrelle and two common pipistrelle. In 2022, one Leisler's bat and eight pipistrelle bats (mixed soprano and common pipistrelle) emerged from the locations described above plus the roof of the porch located on the western elevation of the building. After emerging from the dwelling, the pipistrelle were recorded foraging along the treeline adjacent to the dwelling and Leisler's foraged briefly above the site.

Building 2

No bats were recorded emerging from the disused dwelling or outbuildings during the emergence surveys undertaken on 30th August 2021 and 25th August 2022. In 2022, one common pipistrelle was observed emerging from the Ash tree identified in Figure 3-1 as PTR No. 1, located to the south of Building 2.

In 2021, soprano and common pipistrelle were recorded from c.12 minutes after sunset foraging along the public road adjacent to the building, indicating the likely presence of a roost nearby.

Cluster of buildings 4

A total of seven natterer's bat and one brown long-eared bat were recorded emerging from the disused dwelling during the emergence survey undertaken on 28th August 2021. One natterer's bat and five common pipistrelle were recorded emerging from the disused dwelling during the emergence survey undertaken on 22nd August 2022.

Other species recorded foraging in the vicinity of the farmyard during the course of the emergence surveys included common pipistrelle, Leisler's bat; one whiskered bat was also recorded in 2021.

Building 5

No bats were recorded emerging from the old national school during the emergence survey undertaken on 31st August 2021 and 24th August 2022.

3.3 Interpretation and Evaluation of Survey Results

Presence/ absence: One Leisler's bat, three soprano pipistrelle and two common pipistrelle bats were recorded emerging from the house present within the Study Area buffer at the north of the Study Area in 2021; one Leisler's bat and eight pipistrelle (common and soprano pipistrelle) were recorded emerging from this building in 2022 (Grid ref: 534136,563990).

Seven natterer's bat and one brown long-eared bat were recorded emerging from a disused dwelling on the eastern boundary of the Study Area in 2021 (Grid ref: 534730,563547); one natterer's bat and five common pipistrelle were recorded emerging from this building in 2022.

No bats were recorded emerging from the disused dwelling on the south-eastern boundary of the Study Area (534595,562768). However, a single common pipistrelle was recorded emerging from an Ash tree to the south of this building in 2022 and soprano and common pipistrelle were recorded close to sunset in the vicinity of this location in 2021, indicating the likely presence of a roost nearby.

Population size class assessment: The disused dwelling within the Study Area buffer to the north of the Study Area supports a minor summer pipistrelle and Leisler's bat roost, and is likely a satellite roost or a roost for a small group of males. The disused dwelling within the Study Area boundary at the east of the Study Area supports a natterer's bat roost; this species tends to roost in small numbers, therefore this is likely a small maternity roost. The disused dwelling supported a minor common pipistrelle roost in 2022 and is likely a satellite roost or a roost for a small group of males. The disused dwelling also supported a minor summer brown long-eared bat roost (individual/small numbers) in 2021. Brown long-eared bat was not recorded at this location in 2022, however, it is noted that this species echolocates quietly and may potentially have been present but not picked up on the detector.

Site status assessment: The habitat within the Study Area provides suitable foraging and commuting areas along streams, hedgerows, treelines and forestry edges. The summer emergence surveys confirmed the presence of one minor summer roost for Leisler's bat, common and soprano pipistrelle; and one maternity roost for natterer's bat, a minor roost for brown long-eared bat and common pipistrelle within the Study Area and its immediate environs. The bats from these roosts were recorded foraging along the shelter of the tree-lined local roads and access tracks within the Study Area.

Common and soprano pipistrelle were recorded early in the evening on the public road to the south-east of the site, indicating the likely presence of a roost nearby.

In winter bats may roost in parts of buildings in cooler areas with stable temperatures. The potential for bats to hibernate in dwellings at the periphery of the Study Area cannot be excluded, however the outbuildings surveyed are unlikely to provide stable temperatures in the winter. No caves or other underground features are known to exist at the proposed Study Area and its environs.

Three trees of moderate suitability for roosting bats were recorded on the eastern boundary of the Study Area. A minor common pipistrelle roost is present in an Ash tree at the south-east of the site (Figure 3-2).

Figure 3-2: Location map of bat roosts recorded at the Proposed Development Study Area at Barnadivane



4 Assessment

This section provides a general commentary on constraints and potential impacts of the Proposed Development in relation to bat roosts.

4.1 Constraints

The disused dwelling situated to the north of the Study Area at Barnadivane supports a minor summer roost of Leisler's and pipistrelle bats and the disused dwelling at the east of the Study Area supports a natterer's bat maternity roost and a minor common pipistrelle and brown long-eared bat roost. As detailed in Section 1.1, all Irish bats are protected under the Wildlife Act (Revised). Destruction, alteration or evacuation of a known bat roost is a notifiable action under current legislation and a derogation licence has to be obtained from the National Parks and Wildlife Service (NPWS) before works can commence.

In addition, it should be noted that any works interfering with bats and especially their roosts, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by the NPWS.

4.2 Potential Impacts

This section provides a general high-level overview of potential impacts on the bat roost sites recorded within the Study Area at Barnadivane. A more detailed assessment of the potential impact of the Proposed Wind Farm and Substation at Barnadivane on bats can be found in the EIAR for the Proposed Development.

As outlined by Scottish Natural Heritage (2019), wind farms can affect bats in the following ways:

- Collision mortality, barotrauma and other injuries
- Loss or damage to commuting and foraging habitat
- Loss of, or damage to roosts
- Displacement of individuals or populations

5 Recommendations

No demolition or construction works are proposed to the structures that are the subject of this report. As such, loss of, or damage to roosts will be avoided.

Disturbance of occupied roosts should be prevented by restricting construction activities in their vicinity.

There should be no direct illumination of known bat roosts as identified in this report (Figure 3-2). Lighting shall be directed away from the roosts by the use of directional lighting (i.e. lighting which only shines on the proposed works and not nearby countryside) to prevent overspill. This shall be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only.

If, for unforeseen reasons, works to a structure identified as bat roost become unavoidable it will be necessary to apply for a derogation licence from NPWS wildlife licencing section before works are allowed. The destruction of known roosts cannot proceed without a derogation licence (Section 23 & 34 licence prescribed under the Wildlife Act 1976 (as amended); and Section 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) being in place and specific mitigation measures being approved in advance with NPWS.

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Appendix A: Description of Irish Bat Species

Ireland has ten known bat species from two distinct families. Each is briefly described below. For a more comprehensive overview see Roche *et al* (2014). The conservation status of each species is derived from NPWS (2019).

Vespertilionidae:

Common pipistrelle (*Pipistrellus pipistrellus*)

This species was only recently separated from its sibling, the soprano or brown pipistrelle *P. pygmaeus*, which is detailed below (Barratt et al, 1997). The common pipistrelle's echolocation calls peak at 45 kHz. The species forages along linear landscape features such as hedgerows and treelines as well as within woodland. The conservation status of this species is Favourable.

Soprano pipistrelle (*Pipistrellus pygmaeus*)

The soprano pipistrelle's echolocation calls peak at 55 kHz, which distinguishes it readily from the common pipistrelle on detector. The pipistrelles are the smallest and most often seen of our bats, flying at head height and taking small prey such as midges and small moths. Summer roost sites are usually in buildings but tree holes and heavy ivy are also used. Roost numbers can exceed 1,500 animals in mid-summer. The conservation status of this species is Favourable.

Nathusius' pipistrelle (*Pipistrellus nathusii*)

Nathusius' pipistrelle is a recent addition to the Irish fauna and has mainly been recorded from the north-east of the island in Counties Antrim and Down (Richardson, 2000) and also in Fermanagh, Longford and Cavan. It has also been recorded in Counties Cork and Kerry (Kelleher, 2005). However, the known resident population is enhanced in the autumn months by an influx of animals from Scandinavian countries. The conservation status of this species is Favourable.

Leisler's bat (*Nyctalus leisleri*)

This species is Ireland's largest bat, with a wingspan of up to 320mm; it is also the third most common bat, preferring to roost in buildings, although it is sometimes found in trees and bat boxes. It is the earliest bat to emerge in the evening, flying fast and high with occasional steep dives to ground level, feeding on moths, caddis-flies and beetles. The echolocation calls are sometimes audible to the human ear being around 15 kHz at their lowest. The audible chatter from their roost on hot summer days is sometimes an aid to location. The conservation status of this species is Favourable.

Brown long-eared bat (*Plecotus auritus*)

This species of bat is a 'gleaner', hunting amongst the foliage of trees and shrubs, and hovering briefly to pick a moth or spider off a leaf, which it then takes to a sheltered perch to consume. They often land on the ground to capture their prey. Using its nose to emit its echolocation, the long-eared bat 'whispers' its calls so that the insects, upon which it preys, cannot hear its approach (and hence, it needs oversize ears to hear the returning echoes). As this is a whispering species, it is extremely difficult to monitor in the field as it is seldom heard on a bat detector. Furthermore, keeping within the foliage, as it does, it is easily overlooked. It prefers to roost in old buildings. The conservation status of this species is Favourable.

Natterer's bat (*Myotis nattereri*)

This species has a slow to medium flight, usually over trees but sometimes over water. It usually follows hedges and treelines to its feeding sites, consuming flies, moths, caddis-flies and spiders. Known roosts are usually in old stone buildings but they have been found in trees and bat boxes. The Natterer's bat is one of our least studied species and further work is required to establish its status in Ireland. The conservation status of this species is Favourable.

Daubenton's bat (*Myotis daubentonii*)

This bat species prefers feeding close to the surface of smooth water, either over rivers, canals, ponds, lakes or reservoirs but it can also be found foraging in woodlands. Flying at 15 kilometres per hour, it gaffs insects with its over-sized feet as they emerge from the surface of the water - feeding on caddis flies, moths, mosquitoes, midges etc. It is often found roosting beneath bridges or in tunnels and also makes use of hollows in trees. The conservation status of this species is Favourable.

Whiskered bat (*Myotis mystacinus*)

This species, although widely distributed, has been rarely recorded in Ireland. It is often found in woodland, frequently near water. Flying high, near the canopy, it maintains a steady beat and sometimes glides as it hunts. It also gleans spiders from the foliage of trees. Whiskered bats prefer to roost in buildings, under slates, lead flashing or exposed beneath the ridge beam within attics. However, they also use cracks and holes in trees and sometimes bat boxes. The conservation status of this species is Favourable.

Brandt's bat (*Myotis brandtii*)

According to NPWS (2013), whiskered and Brandt's bats are cryptic species and can only be told apart using DNA techniques. Brandt's bat has been confirmed only once from Ireland; a single specimen found in 2003 in Wicklow (Mullen, 2006). Following this discovery, an intensive re-survey, involving DNA testing, was undertaken of all known whiskered bat roosts in Ireland, by the Centre for Irish Bat Research. Woodland mist-netting was also conducted for the species. Despite the extensive survey-work, no further Brandt's bats were identified. The most recent Red Data List for Irish Mammals (Marnell *et al.* 2009) lists Brandt's bat as data deficient. There is no evidence of any roosts for this species in the country and at present the single record for the species is considered an anomaly. Boston *et al* (2010) concluded that "M. brandtii cannot currently be considered a resident species. This species is now considered a vagrant to the country and consequently, a detailed assessment has not been carried out.

Rhinolophidae:

Lesser horseshoe bat (*Rhinolophus hipposideros*)

This species is the only representative of the Rhinolophidae or horseshoe bat family in Ireland. It differs from our other species in both habits and looks, having a unique nose leaf with which it projects its echolocation calls. It is also quite small and, at rest, wraps its wings around its body. Lesser horseshoe bats feed close to the ground, gleaning their prey from branches and stones. It often carries its prey to a perch to consume, leaving the remains beneath as an indication of its presence. The echolocation call of this species is of constant frequency and, on a heterodyne bat detector, sounds like a melodious warble. The species is confined to six counties along the Atlantic seaboard: Mayo, Galway, Clare, Limerick, Kerry and Cork. The current Irish national population is estimated at 12,500 animals. This species is listed on Annex II of the EC Habitats Directive and 41 Special Areas of

Conservation have been designated in Ireland for its protection. Where it occurs, it is often found roosting within farm buildings. The conservation status of this species is Inadequate.

