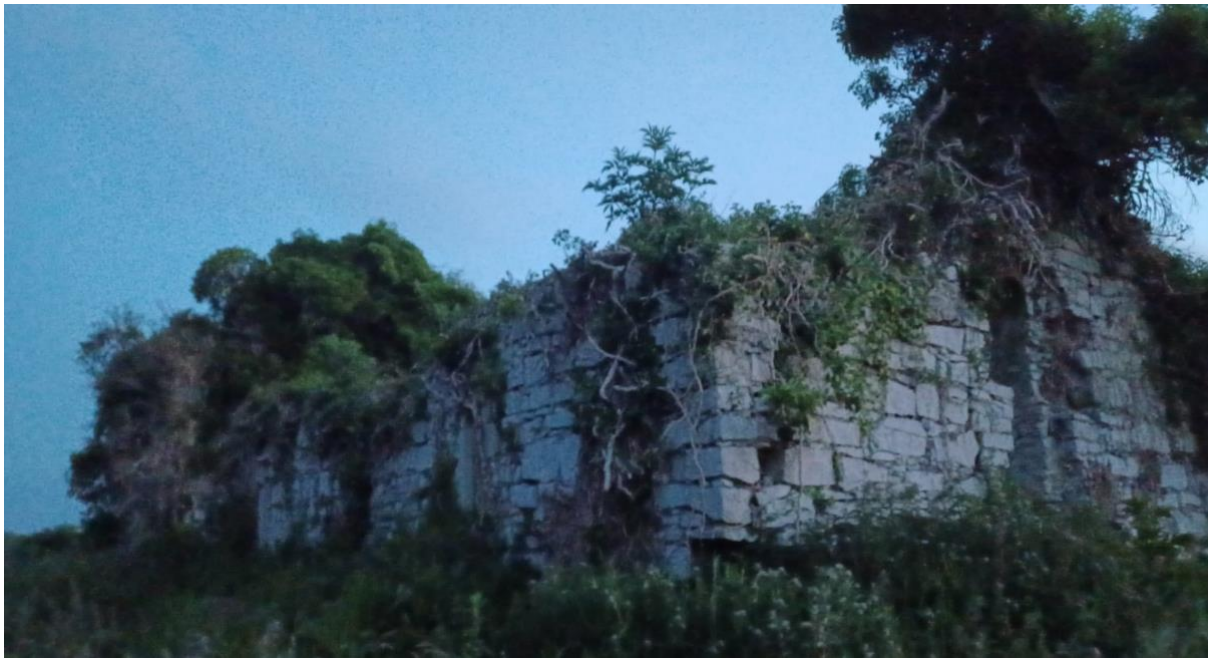
A bat and bird survey of Castle Lost Church

Westmeath

Grid ref - N 44937 41809

For The Castlelost Heritage Project



By Donna Mullen M.P.P.M D.E.N.V.S. P

Brian Keeley BSc Hons in Zool

Maio, Tierworker, Kells Co Meath

Date June 5, 2024

www.wildlifesurveys.net

Summary of report

Although the numbers of individual bats on this site are low, there are six of our nine species present, and two species – Daubenton's and brown long eared bats – are roosting within the underground chamber. The brown long eared bat may be using this area as a night perch, as it was only seen during the night. The Daubenton's bat was present within the stonework at dusk and dawn.

Six species of bat were recorded within the site.

Bat species found roosting

Daubenton's bat - *Myotis daubentonii*

Brown long eared bat – *Plecotus auritus*

Bat species found feeding and commuting

Common pipistrelle – *Pipistrellus pipistrellus* -

Soprano pipistrelle – *Pipistrellus pygmaeus* –

Leisler's bat – *Nyctalus leisleri*

Daubenton's bat - *Myotis daubentonii*

Natterer's bat *Myotis nattereri*

Brown long eared bat – *Plecotus auritus*

Birds

Nests within the church

Two nests were occupied within the church in June 2024. The approximate locations of these nests and images of the nests are shown in the following images. One nest was within the Nave and registered as being active by the emission of heat detected on the thermal imager. A scolding wren was noted at the start of the survey and this may have been the occupant of the nest (or a partner to a nesting female). The second nest was to the rear of the apse (on the outside wall) and again was behind ivy. This also registered as occupied based on the heat emitted. It is probable that this was also a wren's nest.

Recommendations and mitigation

(1)The church is a roost of two species, and a derogation licence must be applied for prior to the commencement of any work on the site. Although the work on the exterior wall is away from the roost, the presence of scaffolding and people will impact the roost area .An ecologist must supervise the work.

The wildlife ranger must be contacted before commencement of any work.

(2) 2 2F Schwegler bat boxes could be placed near this site with the consent of the landowner. These must be placed on trees, buildings, or poles, at least 3 meters high, with a clear drop below them – as bats must drop to fly. They must be placed in a dark area. They can be purchased here - https://www.veldshop.nl/en/schwegler-bat-box-2f.html?id=46351610

In addition, cracks and crevices must be retained where possible. At least 30 crevices must be retained in each wall. Two Schwegler 2FR bat tubes must be built into the wall for restoration.(https://www.veldshop.nl/en/bat-tube-1fr-and-2fr.html

(3) If bats are discovered at any stage of the building work, building work must cease and myself and the wildlife ranger must be contacted.

(4) No work can take place from May to September as bats and birds may be breeding.

(5)To compensate for the loss of vegetation with the removal of ivy, some new hedgerows should be installed and allowed to grow tall, with the landowner's permission. These should be native and include native trees. A company such as Ramor landscaping can provide the hedge planting service - https://www.ramorlandscaping.ie/.

In addition, providing long swards of grass by fencing livestock out ,would provide additional areas for the ghost moth and shrews which were noted in 2023.

(6) There are low light levels on sites, and this is crucial to the usage of the bats in the buildings. Lighting levels must remain low.

(7) It is possible that the castle and church is used by bats as a hibernation or swarming site. A remote song meter mini could be placed in the underground section of the castle and church at intervals over the autumn and winter to see if there is bat activity.

(8) No vegetation can be removed during the nesting season.

Desktop Survey of the existing environment

Results from the survey in 2023 of Castlelost church and castle

Bat species found roosting at Castle Lost Church

Brown long eared bat – *Plecotus auritus*

Bat species found feeding and commuting on the church site

Common pipistrelle -*Pipistrellus pipistrellus*

Soprano pipistrelle –P*ipistrellus pygmaeus*

Leisler's bat – *Nyctalus leisleri*

Brown long eared bat – *Plecotus auritus*

Bat species found roosting at Castle Lost Castle

Soprano pipistrelle –P*ipistrellus pygmaeus* – roosting in 2 places

Natterer's bat – *Myotis nattereri*

Brown long eared bat – *Plecotus auritus*

Bat species found feeding and commuting on the site of the castle

Common pipistrelle -*Pipistrellus pipistrellus*

Soprano pipistrelle –P*ipistrellus pygmaeus*

Leisler's bat – *Nyctalus leisleri*

Brown long eared bat – *Plecotus auritus*

Natterer's bat – *Myotis nattereri*

Bat data from within 1km of the site, logged on the BCI database

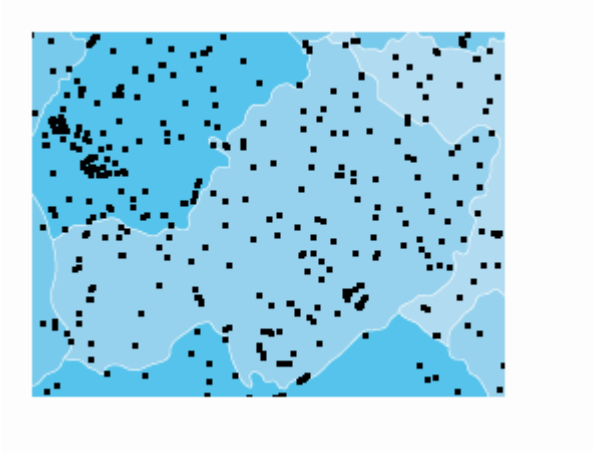
BCIreland data: search results 25 Jun 2024					
Search parameters: Roosts Transects Ad-hoc observation sites with observations of all species within 1000m of N4493741809					
Roosts					
Name	**Grid reference**	**Grid ref**	**Grid ref**	**Address**	**Species observed**

		easting	northing		
Castle Lost Castle	**N4507941369**	**245079**	**241369**	**Castle Lost, Westmeath**	**Myotis natterreri,Pipistrellus pipistrellus (45kHz),Plecotus auritus**
Castle Lost Church	**N4493741784**	**244937**	**241784**	**Near Rocherfordbridge westmeath**	**Plecotus auritus**
Transects					
Name	**Grid reference start**	**Grid ref easting start**	**Grid ref northing start**	**Species observed**	
Ad-hoc observations					
Survey	**Grid reference**	**Grid ref easting**	**Grid ref northing**	**Date**	**Species observed**
BATLAS 2020	**N4421042340**	**244210**	**242340**	**########**	**Pipistrellus pygmaeus**
BATLAS 2020	**N4421042340**	**244210**	**242340**	**6/9/2016**	

Thanks to Bat Conservation Ireland for their data. All data from this report will be placed on their database.

See Appendix III for data within a 10km radius

Common pipistrelle distribution in Westmeath



Soprano pipistrelle distribution in Westmeath

Leisler’s bat distribution in Westmeath

Natterer’s bat distribution in Westmeath

Brown long eared bat in Westmeath

Daubenton's bat in Westmeath

Bird data from the NBDC within the 2 km square covering Castlelost church

Common Buzzard (Buteo buteo)	1 bird	03/02/2018	Birds of Ireland	Protected under the Wildlife Act 1976 and 2000

Habitat Classification (Fossitt 2000)

BL3 (buildings) WL2 (treelines) GAI (Grassland)

Date 5 June 2024

Survey constraints

(1) Mobility of bats – Bat species are mobile and can move from roost to roost, depending on roost availability, feeding availability and weather conditions. They may move to roosts which have not been identified in this report in order to hibernate or create mating or feeding perches. A bat survey is a snapshot of bat activity over the survey time.

(2) Identification of bats- It can be difficult to differentiate *Myotis* species. For this reason, sound files are included within the report. Brown long eared bats are very quiet, and their presence can be overlooked in bat surveys as they may not register on bat detectors.

(3) Timing of survey. Bat surveys generally take place when the bats are active – May – September. A bat survey which takes place outside these dates may miss roosting activity. The survey period is highly suitable for bird breeding surveys as this is the key nesting period and all migratory breeding species are present.

Temperature and weather conditions – 10C

Complexity of lands and ability to cover ground during surveys All areas were accessible.

Sunrise/sunset 5.03 21.53

Description of project –Stage 1- Restoration and repointing of the south eastern wall

Light pollution
There were low levels of light pollution on site.

Connectivity

The site is isolated. There is a lack of connectivity through hedgerows to allow connection of the site to surrounding vegetation. Birds are exposed to predation from sparrowhawks etc. crossing to the graveyard but a number of birds were seen to fly to and from the site.

Explanation as to why the derogation licence sought is the only available option for works and no suitable alternative exists as per Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations

The church is a ruin, and works are required to prevent collapse.

The church and graveyard are very isolated. Planting native vegetation along the ditches would enhance the area for bats.

Yellow arrows suggest possible areas for planting.

Methodology

Bat Survey - Equipment

Exide Lamps

Petzl Tikka Head torch

One Anabat walkabout detector and Kaleidoscope sound analysis software with GPS

One mini song meter with sound analysis

One Echo meter touch

One Fibrescope

One Thermal imager – Pulsar Helion 2 XP50 Pro

One 8 x 42 Hawke Frontier ED binoculars

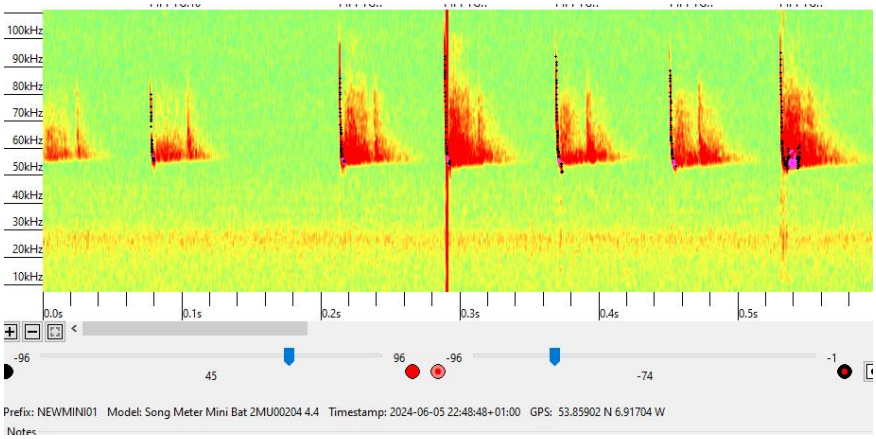
Castle Lost Church and Graveyard

The survey commenced at 21.30. The building was examined for signs of bats – droppings, squeaking, etc. One Daubenton's bat was seen in a cavity in the underground chamber at 22.50. A brown long eared bat was also seen flying within this chamber.

Daubenton's bat roosting in stonework near the door underground

Photograph with fibrescope of Daubenton's bat

A common pipistrelle was seen flying outside the church, to the north at 23.36.A soprano pipistrelle flew within the church walls at 22.48, and a brown long eared bat was recorded at 22.52.A natterer's bat was also recorded at 22.56.



Soprano pipistrelle

A Leisler's bat flew through the site at 2.54. The Daubenton's bat stayed within it's roost all night. It frequently groomed itself but did not go out. Both surveyors arrived on site 1.5 hours before dawn, but no other bats were present.

Maps of main bat activity

a 

Blue triangle – Common pipistrelle

Red triangle- Leisler's bat

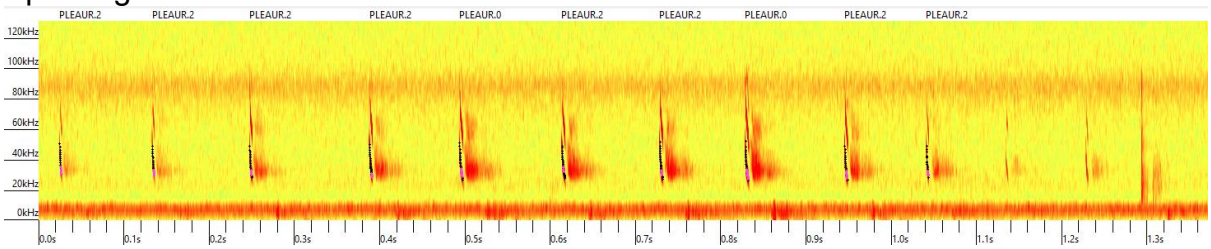
Brown triangle – Brown long eared bat

Purple triangle – Natterer's bat

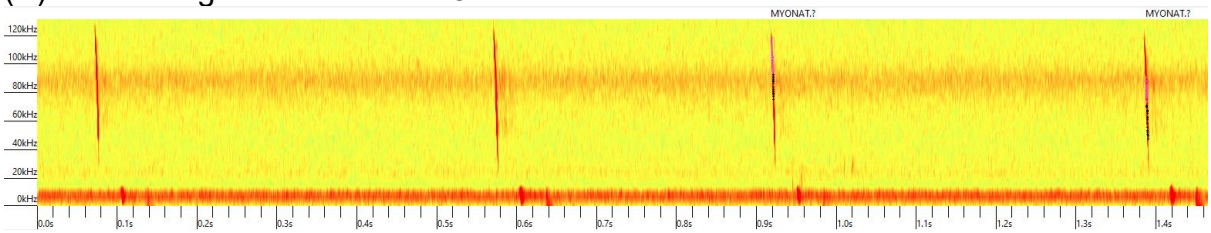
Green triangle – Soprano pipistrelle

Grey triangle – Daubenton's bat

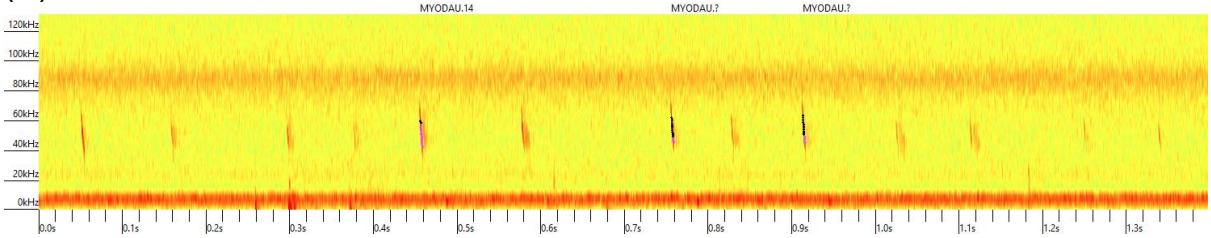
Spectrograms from Castlelost



(B) Brown long-eared bat at 22.52 hours



(N) Natterer's bat at 22.56 hours



(D) Daubenton's bat at 23.30 hours

Results - Bats

Although the numbers of individual bats on this site are low, there are six of our nine species present, and two species – Daubenton's and brown long eared bats – are roosting within the underground chamber. The brown long eared bat may be using this area as a night perch, as it was only seen during the night. The Daubenton's bat was present within the stonework at dusk and dawn.

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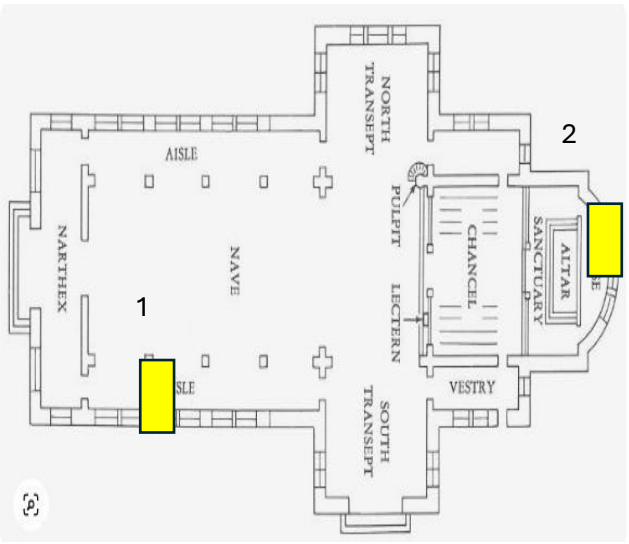
Birds

Nests within the church

Two nests were occupied within the church in June 2024. The approximate locations of these nests and images of the nests are shown in the following images. One nest was within the Nave and registered as being active by the emission of heat detected on the thermal imager. A scolding wren was noted at the start of the survey and this may have been the occupant of the nest (or a partner to a nesting female). The second nest was to the rear of the apse (on the outside wall) and again was behind ivy. This also registered as occupied based on the heat emitted. It is probable that this was also a wren's nest.



The following species were heard and the approximate locations for each are given :

Goldcrest (in rowan to rear of church); probably nesting in yew tree

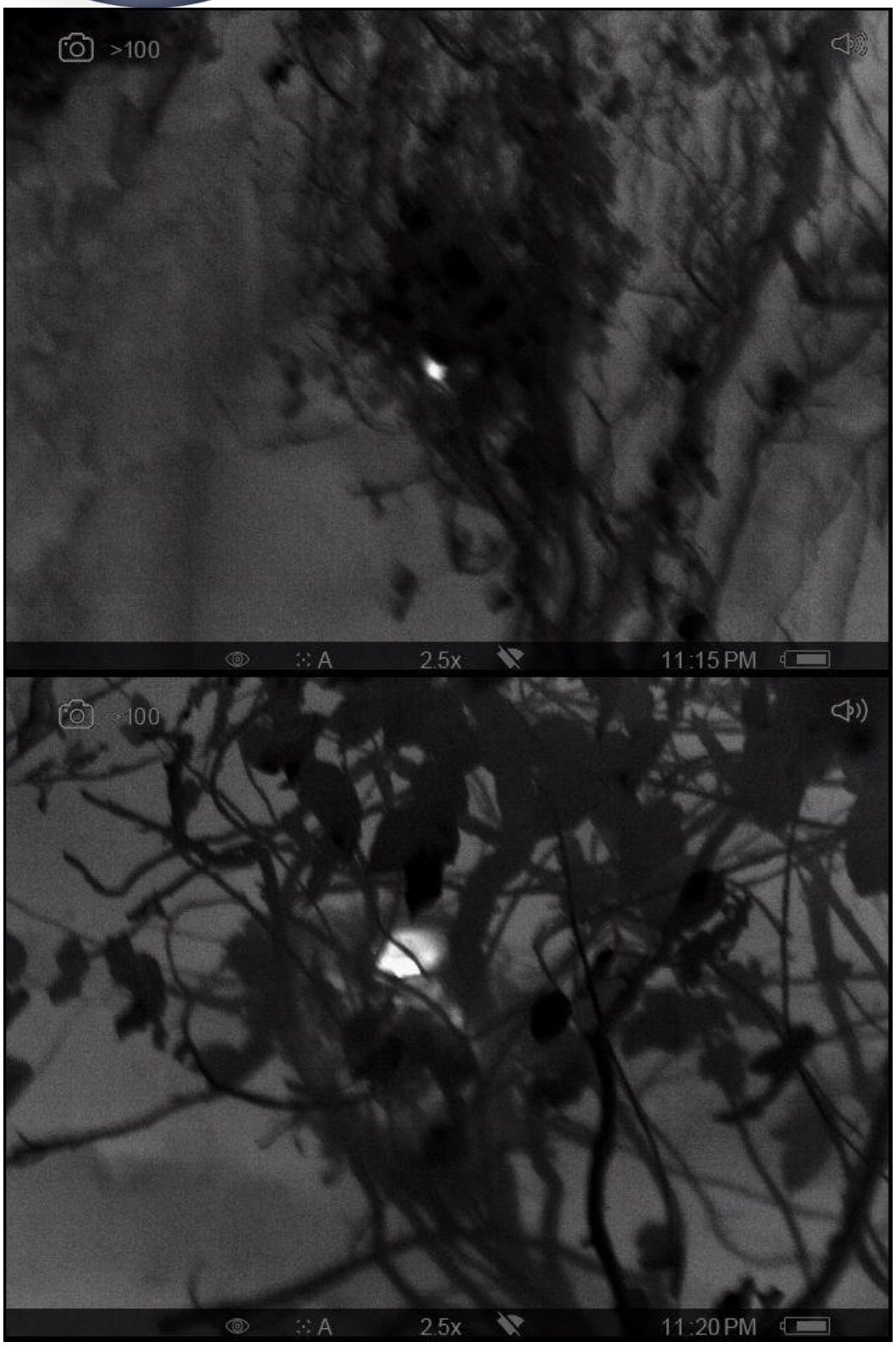
Wren behind goldcrest singing

blackbird robin

Dunnock in hawthorn on perimeter

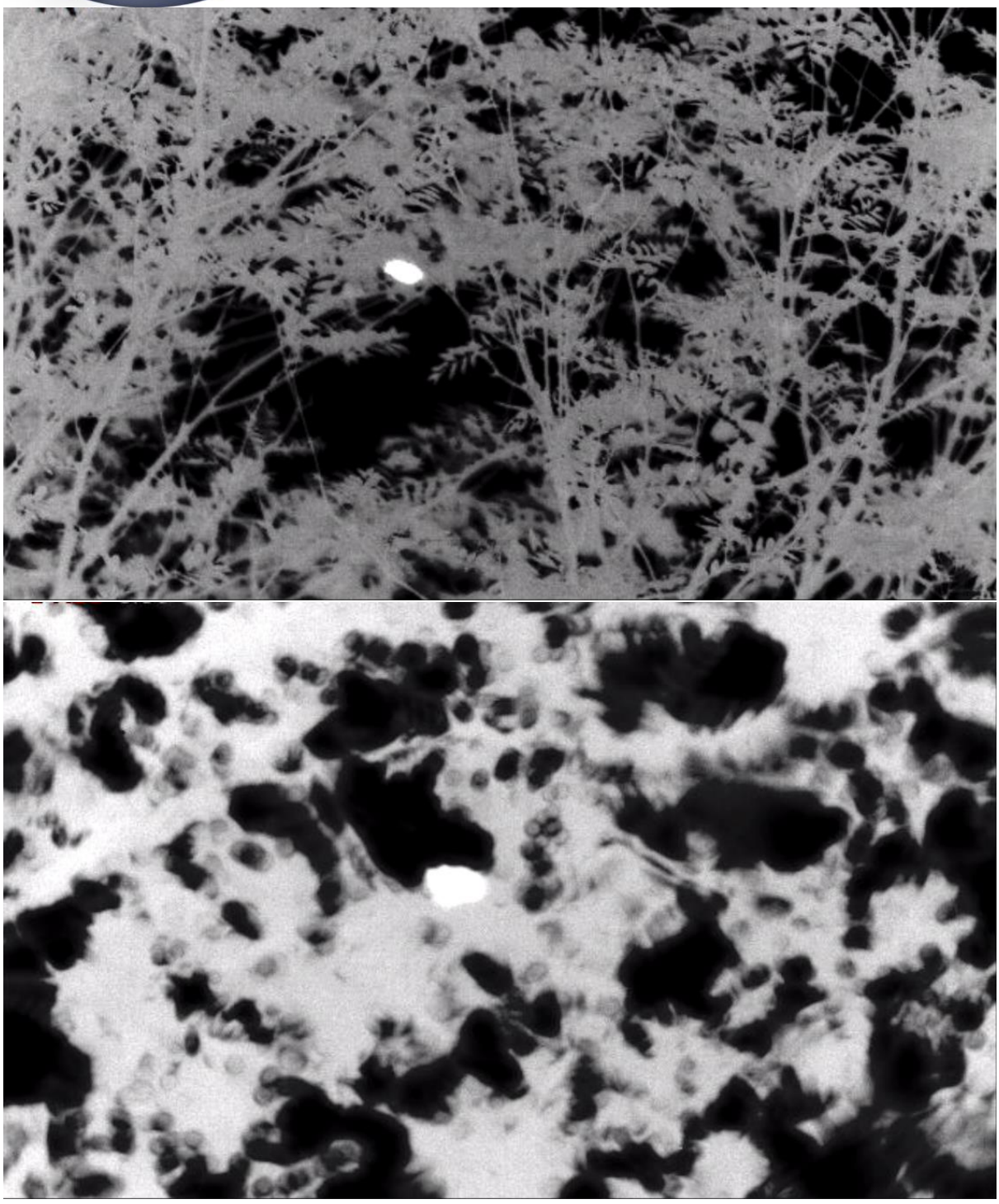
Second goldcrest singing in yew tree near gate

Woodpigeon Hooded crow Song thrush in forest Chaffinch near gate Rook



Nest at site 1

Nest at site 2



Goldcrest in rowan (top) and wren in tree behind goldcrest (bottom)

Birds noted in 2023

Nesting Wren (perimeter wall) (Troglodytes troglodytes)

Goldcrest (calling from rowan and ivy-covered hawthorn) (Regulus regulus)

Chaffinch (tree to the front of the church along perimeter of entry wall) (Fringilla coelebs) Feeding or calling in and around the church grounds

Robin Blackbird Song thrush Wren Buzzard Cuckoo (neighbouring conifer plantation)

Blackcap Swallow Goldcrest Dunnock

Chaffinch (in church at one point at sunrise, male noted to fly and sing from perimeter tree) Greenfinch Hooded crow

Less species were in evidence in 2024. Within the church area, species such as blackcap and greenfinch were absent. Swallows were note seen flying past during this assessment (note: swallows were not nesting on or in the church and are associated with nearby farmyards and houses). No cuckoo was heard during the 2024 assessment.

Recommendations and mitigation

Details of any mitigation measures planned for the species affected by the derogation at the location, along with evidence that such mitigation has been successful elsewhere

(1)The church is a roost of two bat species, and a derogation licence must be applied for prior to the commencement of any work on the site. Although the work on the exterior wall is away from the roost, the presence of scaffolding and people will impact the roost area .An ecologist must supervise the work. There are two bird nests that were occupied in June 2024. Nesting will cease by the end of August for species such as wren which is the most evident nesting species at the church (the goldcrests are most probably nesting in conifers such as the yew).

The wildlife ranger must be contacted before commencement of any work.

(2)) 2 2F Schwegler bat boxes could be placed near this site with the consent of the landowner. These must be placed on trees, buildings, or poles, at least 3 meters high, with a clear drop below them – as bats must drop to fly. They must be placed in a dark area. They can be purchased here - https://www.veldshop.nl/en/schwegler-bat-box-2f.html?id=46351610

In addition, cracks and crevices must be retained where possible. At least 30 crevices must be retained in each wall. Two Schwegler 2FR bat tubes must be built into the wall for restoration.(https://www.veldshop.nl/en/bat-tube-1fr-and-2fr.html 2

These have been used successfully in Golashane Nature Reserve in Meath.

At least 30 crevices must be retained in each wall. Bat tubes have successfully been used by Daubenton's bats in Gubbilaun Abbey, Rossinver, Leitrim. Two Schwegler

(3) If bats are discovered at any stage of the building work, building work must cease and myself and the wildlife ranger must be contacted.

(4) No work can take place from March 1st to September as bats may be breeding and birds are nesting.

(5)To compensate for the loss of vegetation, some new hedgerows should be installed and allowed to grow tall, with the landowner's permission. These should be native and include native trees. A company such as Ramor landscaping can provide the hedge planting service - https://www.ramorlandscaping.ie/.

In addition, providing long swards of grass by fencing livestock out ,would provide additional areas for the ghost moth and shrews which were noted in 2023.

(6) There are low light levels on sites, and this is crucial to the usage of the bats and the buildings. Lighting levels must remain low.

(7) It is possible that the castle and church is used by bats as a hibernation or swarming site. A remote song meter mini could be placed in the underground section of the castle and church at intervals over the autumn and winter to see if there is bat activity.

(8) No vegetation can be removed during the nesting season.

Evidence that actions permitted by a derogation licence will not be detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range as is required under Section 54(2) of the European Communities (Birds and Natural Habitats) Regulations. Data from The Status of EU Protected Habitats and Species in Ireland SPECIES ASSESSMENTS Volume 3 2019

Daubenton's bat

5 Range within the biogeographical/marine region concerned.

5.1 Surface area 74,200 km²

5.2 Short-term trend Period 2007–2018

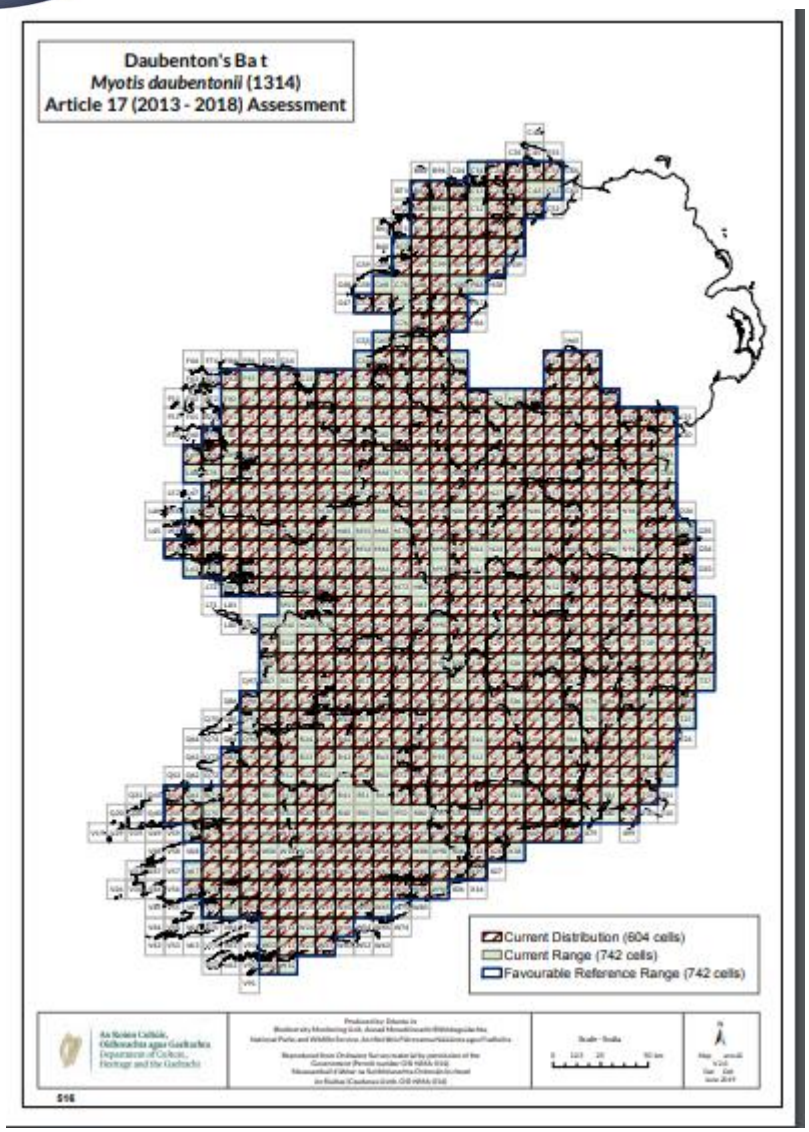
5.3 Short-term trend Direction stable

8.2 Sources of information *Optional*	
8.3 Additional information *Optional*	Light pollution has been identified as a particular concern for *Myotis* bats such as Daubenton's bat (Matthews *et al.*, 2015; Voigt *et al.* 2018). F24 has been selected to represent this pressure, although lighting from industrial developments and roadway developments also contribute to the problem. Despite some growing awareness of light pollution this pressure is likely to continue into the future and it is also listed as a threat. Ranking of importance is based on expert opinion on likely impact of the pressure on the species. Removal of riparian vegetation, bridge repairs and drainage works may also provide some cause for concern for this species and these issues merit further study. There is no evidence to date of an impact on Daubenton's bat distribution due to these issues and hence they are not listed in 8.1.

10 Future prospects		
10.1 Future prospects of parameters	**a) Range**	***Good*** */ Poor / Bad / Unknown*
	b) Population	***Good*** */ Poor / Bad / Unknown*
	c) Habitat of the species	***Good*** */ Poor / Bad / Unknown*

The Daubenton's bat is widespread across all parts of the country and Range is assessed as Favourable as there is no evidence of any decline since the Directive came into force. Recent estimates for this species suggest a population size in the order to 57,000-79,000 animals. Ongoing monitoring indicates that the population is stable or even slightly increasing and there is no evidence of decline in suitable habitat. Although some pressures/threats have been noted, there is no indication of any major pressures currently impacting on the species and future prospects are considered good. Overall, the species is assessed as Favourable and the overall trend is demonstrating an on-going increase. There were no qualifiers for Favourable assessments in 2013.

Wildlife Surveys Ireland



Brown long eared bat

5 Range within the biogeographical/marine region concerned.

5.1 Surface area 62,200 km²

5.2 Short-term trend Period 2007–2018

5.3 Short-term trend Direction stable

8.3 Additional information -As this bat regularly roosts in old buildings (e.g., churches) it can come into conflict with roost owners. The loss of roosts in mature trees due to felling, light pollution and the absence of data on swarming and winter sites are also concerns. However, there is no evidence that any of these issues are impacting on distribution or population and hence they are not listed as medium or important threats for this species.

10 Future prospects		
10.1 Future prospects of parameters	**a) Range**	***Good*** / *Poor / Bad / Unknown*
	b) Population	***Good*** / *Poor / Bad / Unknown*
	c) Habitat of the species	***Good*** / *Poor / Bad / Unknown*
10.2 Additional information *Optional*	The dedicated roost-based monitoring programme provides evidence of a significant increase in the population; there is no evidence of any decline in Range or Habitat. In general the Future prospects of these parameters are considered to be good.	

11 Conclusions	
Assessment of conservation status at end of reporting period	
11.1 Range	***Favourable (FV)*** */ Inadequate (U1) / Bad (U2) / Unknown (XX)*
11.2 Population	***Favourable (FV)*** */ Inadequate (U1) / Bad (U2) / Unknown (XX)*
11.3 Habitat for the species	***Favourable (FV)*** */ Inadequate (U1) / Bad (U2) / Unknown (XX)*
11.4 Future prospects	***Favourable (FV)*** */ Inadequate (U1) / Bad (U2) / Unknown (XX)*

Article 17 report format 2013-2018

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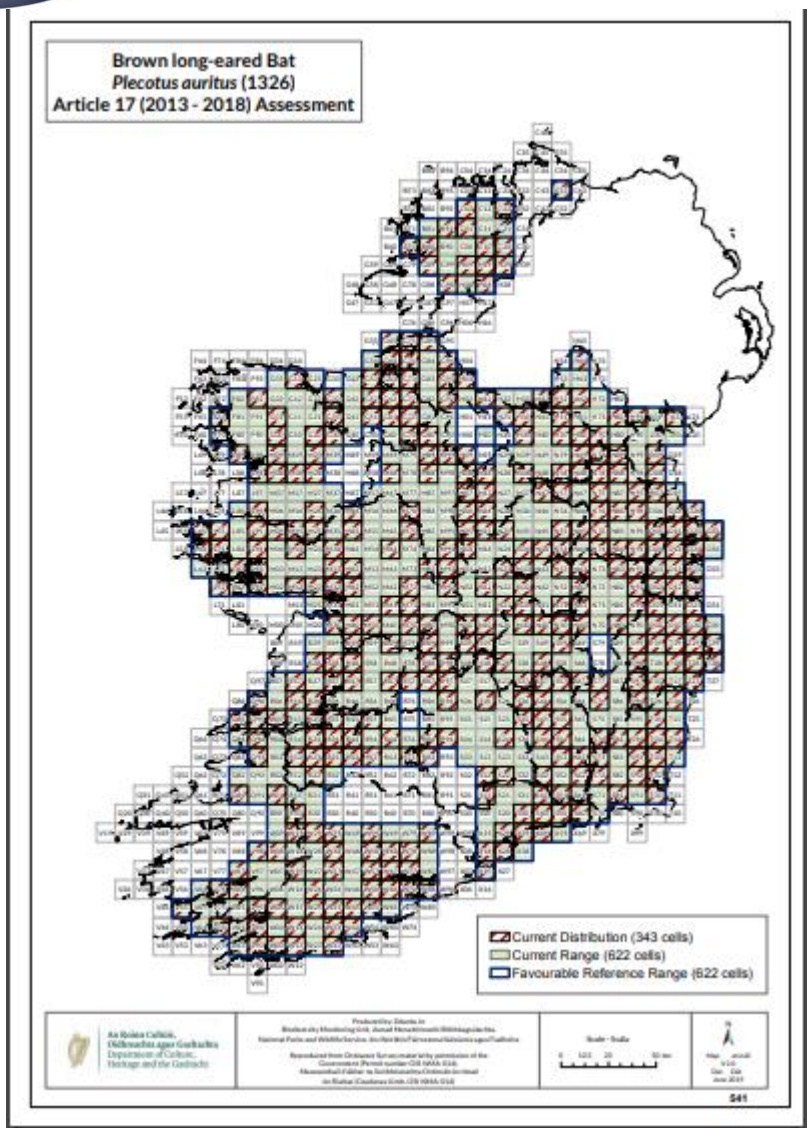
1326 Brown Long-eared Bat (*Plecotus auritus*)

11.5 Overall assessment of Conservation Status	***Favourable (FV)*** */ Inadequate (U1) / Bad (U2) / Unknown (XX)*
11.6 Overall trend in Conservation Status	*Indicate the trend (qualifier) for FV, U1 and U2:* ***improving*** */ deteriorating /* stable */ unknown*

11.8 Additional information - Recent estimates put the Irish population of brown long-eared bats at 60,000-100,000 animals. Monitoring data suggests a recent significant increase in numbers and both Range and Habitat are considered to be stable and Favourable. There is no indication of any major pressures currently impacting the population and Future prospects are considered good. Overall, the species is assessed as Favourable and the overall trend is demonstrating an on-going increase. There were no qualifiers for Favourable assessments in 2013.

Wildlife Surveys Ireland



Legislation

Bats are protected under the 1996 Wildlife Act, the 2000 Wildlife (Amendment) Act, Stat Ist 94 of 1997, Stat Ist 378 of 2005, The Habitats Directive, The Bonn and Bern Convention, and the Euro bats agreement.

The European Community (Natural Habitats) Regulations S.I. No 94 of 1997 states:

23(1) The Minister shall take the requisite measures to establish a system of strict protection for the fauna consisting of the animal species set out in Part 1 of the First Schedule prohibiting –

a) All forms of deliberate capture or killing of specimens of those species in the wild.

1. The deterioration or destruction of breeding sites or resting places of those species.

The EU Habitats Directive

Article 12(1) of the 'Council Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora (Habitats Directive) states:

"Member States shall take the requisite measures to establish a system of strict protection for the animal species listed in Annex IV(a) and their natural range, prohibiting:

a) all forms of deliberate capture or killing of specimens of these species in the wild.

b) deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation, and migration.

c) deliberate destruction or taking of eggs from the wild.

d. deterioration or destruction of breeding sites or resting places."

The EU Habitats Directive (92/43/EEC) lists all Irish bat species in Annex IV and one Irish species, the lesser horseshoe bat (Rhinolophus hipposideros), in Annex II. Annex II includes animal and plant species of community interest whose conservation requires the designation of Special Areas of Conservation (SACs) because they are endangered, rare, vulnerable, or endemic. Annex IV includes various species that require strict protection. Article 11 of the Habitats Directive requires member states to monitor all species listed in the Habitats Directive and Article 17 requires States to report to the EU on the findings of monitoring schemes.

The Bern and Bonn Conventions

Ireland is also a signatory to a number of conservation agreements pertaining to bats such as the Bern and Bonn Conventions. The European Bats Agreement (EUROBATS) is an agreement under the Bonn Convention. Ireland and the UK are two of the 31 signatories. The Agreement has an Action Plan with priorities for

implementation. Devising strategies for monitoring of populations of selected bat species in Europe is among the resolutions of EUROBATS.

1.3.1 The Bern Convention

Article 6 of the “Convention on the Conservation of European Wildlife and Natural Habitats’ (Bern Convention) reads:

“Each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild fauna species specified in Appendix II. The following will in particular be prohibited for these species:

a) all forms of deliberate capture and keeping and deliberate killing.

b) the deliberate damage to or destruction of breeding or resting sites.

c) the deliberate disturbance of wild fauna, particularly during the period of breeding, rearing and hibernation, insofar as disturbance would be significant in relation to the objectives of this Convention; ...

Appendix II lists strictly protected fauna species and this list includes “Microchiroptera, all species except Pipistrellus pipistrelles”.

The EUROBATS Agreement

The ‘Agreement on the Conservation of Populations of European Bats’ (EUROBATS) was negotiated under the ‘Convention for the Conservation of Migratory Wild Species’ (Bonn Convention) and came into force in January 1994. The legal protection of bats and their habitats are given in Article III as fundamental obligations:

“1. Each Party shall prohibit the deliberate capture, keeping or killing of bats except under permit from its competent authority.

2. Each Party shall identify those sites within its own area of jurisdiction which are important for the conservation status, including for the shelter and protection, of bats. It shall, taking into account as necessary economic and social considerations, protect such sites from damage or disturbance. In addition, each Party shall endeavour to identify and protect important feeding areas for bats from damage or disturbance.”

The Agreement covers all European bat species.

Bat Biology

Female bats gather in groups known as maternity roosts in summer to have their young. They generally have one baby each year, so are slow to reproduce, and disturbance of a maternity roost can be catastrophic.

In winter bats move to old stonework, trees, and caves to hibernate. They are also found in modern buildings during building work or demolition. They are especially vulnerable here as they are slow to awaken, and if tree felling is carried out without checking for bats, they can easily be killed.

Contact Details: I can be contacted at 087 7454233. My email is donnamullen@wildlifesurveys.net and web site is www.wildlifesurveys.net

Appendix I

Data from song meter mini with Kaleidoscope sound analysis

File Help

	FOLDER	IN FILE	OUT FILE FS	OUT FILE ZC	AUTO ID	PULSES	MATCHING	MATCH RATIO	MANUAL ID
1	Data	NEWMINI01_20240606_025435.wav	NEWMINI01_20240606_025435_000.wav		NYCLEI	6	6	1.000000	NYCLEI
2	Data	NEWMINI01_20240606_042957.wav	NEWMINI01_20240606_042957_000.wav		NYCLEI	5	5	1.000000	
3	Data	NEWMINI01_20240605_230638.wav	NEWMINI01_20240605_230638_000.wav		NYCLEI	2	2	1.000000	
4	Data	NEWMINI01_20240606_041929.wav	NEWMINI01_20240606_041929_000.wav		NYCLEI	2	2	1.000000	
139	Data	NEWMINI01_20240606_002707.wav	NEWMINI01_20240606_002707_000.wav		PIPPIP	41	41	1.000000	
140	Data	NEWMINI01_20240606_000120.wav	NEWMINI01_20240606_000120_000.wav		PIPPIP	34	32	0.941000	
141	Data	NEWMINI01_20240606_020600.wav	NEWMINI01_20240606_020600_000.wav		PIPPIP	21	21	1.000000	
142	Data	NEWMINI01_20240606_013807.wav	NEWMINI01_20240606_013807_000.wav		PIPPIP	11	11	1.000000	
143	Data	NEWMINI01_20240606_004040.wav	NEWMINI01_20240606_004040_000.wav		PIPPIP	8	8	1.000000	
144	Data	NEWMINI01_20240605_233557.wav	NEWMINI01_20240605_233557_000.wav		PIPPIP	5	5	1.000000	
145	Data	NEWMINI01_20240605_233542.wav	NEWMINI01_20240605_233542_000.wav		PIPPIP	4	4	1.000000	
146	Data	NEWMINI01_20240606_011030.wav	NEWMINI01_20240606_011030_000.wav		PIPPYG	50	50	1.000000	
147	Data	NEWMINI01_20240606_002338.wav	NEWMINI01_20240606_002338_000.wav		PIPPYG	26	26	1.000000	PIPPYG
148	Data	NEWMINI01_20240605_235257.wav	NEWMINI01_20240605_235257_000.wav		PIPPYG	23	23	1.000000	PIPPYG
149	Data	NEWMINI01_20240605_224848.wav	NEWMINI01_20240605_224848_000.wav		PIPPYG	20	20	1.000000	
150	Data	NEWMINI01_20240606_005345.wav	NEWMINI01_20240606_005345_000.wav		PIPPYG	20	20	1.000000	
151	Data	NEWMINI01_20240606_004603.wav	NEWMINI01_20240606_004603_000.wav		PIPPYG	19	19	1.000000	
152	Data	NEWMINI01_20240606_014104.wav	NEWMINI01_20240606_014104_000.wav		PIPPYG	3	3	1.000000	
153	Data	NEWMINI01_20240605_225231.wav	NEWMINI01_20240605_225231_000.wav		PLEAUR	8	6	0.750000	

Appendix II

Data from Anabat Walkabout with Kaleidoscope sound analysis

555		2024-06-06 04-54-13.wav	2024-06-06 04-54-13_00000_000.wav		Noise				
556		2024-06-06 04-53-44.wav	2024-06-06 04-53-44_00000_000.wav		Noise				
557		2024-06-06 04-53-55.wav	2024-06-06 04-53-55_00000_000.wav		Noise				
558		2024-06-05 23-36-18.wav	2024-06-05 23-36-18_00000_000.wav		PIPPIP	4	3	0.750000	PIPPIP
559		2024-06-05 23-48-54 1.wav	2024-06-05 23-48-54 1_00000_000.wav		PIPPYG	6	6	1.000000	PIPPYG

Appendix III

Bat data from within 10 km of the site, logged on the BCI database

BCIreland data: search results 25 Jun 2024					
Search parameters: Roosts Transects Ad-hoc observation sites with observations of all species within 10000m of N4493741809					
Roosts					
Name	Grid reference	Grid ref easting	Grid ref northing	Address	Species observed

09WHSH1WC	N3787336256	237873	236256	Split Hills Esker Woodland, Tyrrellspass, Co. Westmeath	Pipistrellus pygmaeus
10WHNF1WC	N3803937697	238039	237697	New Forest Golf Course, Tyrrellspass, Co. Westmeath	Unidentified bat
10WHNF2WC	N3801837696	238018	237696	New Forest Golf Course, Tyrrellspass, Co. Westmeath	Nyctalus leisleri
11WHN521WC	N4137043062	241370	243062	N52, Mullingar, Co. Westmeath	Pipistrellus pygmaeus
11WHN522WC	N4137243062	241372	243062	N52, Mullingar, Co. Westmeath	Unidentified bat
11WHN523WC	N4137443065	241374	243065	N52, Mullingar, Co. Westmeath	Unidentified bat
11WHN524WC	N4137443069	241374	243069	N52, Mullingar, Co. Westmeath	Unidentified bat
11WHN525WC	N4242545233	242425	245233	N52, Mullingar, Co. Westmeath	Pipistrellus spp. (45kHz/55kHz)
11WHN526WC	N4242545233	242425	245233	N52, Mullingar, Co. Westmeath	
Castle Lost Castle	N4507941369	245079	241369	Castle Lost, Westmeath	Plecotus auritus,Pipistrellus pipistrellus (45kHz),Myotis natterreri
Castle Lost Church	N4493741784	244937	241784	Near Rocherfordbridge westmeath	Plecotus auritus
Commercial grain stores	N503511	250300	251100	Three storey farm building with barns and commercial grain stores, Downes, County Westmeath	Pipistrellus pipistrellus (45kHz)
Knockmant	N5267850933	252678	250933	Knockmant, County Westmeath N91 Y02P	Pipistrellus pygmaeus
Ladestown	N4049	240000	249000	Lough Ennel, Mullingar, County Westmeath	Unidentified bat
Lynburry Stable	N4305048800	243050	248800	Lynnbury B&B, Mullingar, County Westmeath	Pipistrellus pygmaeus,Myotis spp.

Lynnbury House	N4305048800	243050	248800	Mullingar, County Westmeath	Pipistrellus pygmaeus
Tudenham Park	N419472	241900	247200	Mullingar, County Westmeath	Pipistrellus pygmaeus,Plecotus auritus,Myotis daubentonii
Transects					
Name	Grid reference start	Grid ref easting start	Grid ref northing start	Species observed	
Ballinagore Transect	N3605938950	236059	238950	Unidentified bat,Myotis daubentonii,Nyctalus leisleri,Pipistrellus spp. (45kHz/55kHz)	
Ballinea Bridge Transect	N3850051100	238500	251100	Myotis daubentonii,Unidentified bat	
Ballynagore Transect spot 1	N3605938950	236059	238950	Myotis daubentonii	
Ballynagore Transect spot 10	N3560039600	235600	239600	Myotis daubentonii,Nyctalus leisleri,Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz)	
Ballynagore Transect spot 2	N3598739039	235987	239039		
Ballynagore Transect spot 3	N3588439059	235884	239059	Unidentified bat	
Ballynagore Transect spot 4	N3579039095	235790	239095		
Ballynagore Transect spot 5	N3570739167	235707	239167		
Ballynagore Transect spot 6	N3564439264	235644	239264	Unidentified bat	
Ballynagore Transect spot 7	N3559439358	235594	239358	Myotis daubentonii,Unidentified bat	
Ballynagore Transect spot 8	N3555339483	235553	239483		
Ballynagore Transect spot 9	N3557339575	235573	239575		

Baltrasna Bridge Transect	N4718051 300	2471 80	25130 0	Myotis daubentonii,Unidentified bat	
Bellmount Bridge Transect	N3950051 100	2395 00	25110 0	Unidentified bat,Myotis daubentonii,Pipistrellus pipistrellus (45kHz),Nyctalus leisleri	
Butle	N4200050 300	2420 00	25030 0	Myotis daubentonii,Unidentified bat,Pipistrellus spp. (45kHz/55kHz),Nyctalus leisleri	
Butler	N4200050 300	2420 00	25030 0		
Coola Mills Transect	N4200050 200	2420 00	25020 0	Myotis daubentonii,Unidentified bat	
Gaybrook Transect 1	N4520046 950	2452 00	24695 0	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri	
Gaybrook Transect 2	N4740047 950	2474 00	24795 0	Nyctalus leisleri	
Gaybrook Transect 3	N4935047 650	2493 50	24765 0	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri	
Gaybrook Transect 4	N4920045 350	2492 00	24535 0	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)	
Gaybrook Transect 5	N4895043 150	2489 50	24315 0	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)	
Gaybrook Transect 6	N4705044 750	2470 50	24475 0	Nyctalus leisleri	
Gaybrook Transect 7	N4710045 900	2471 00	24590 0	Nyctalus leisleri,Pipistrellus pygmaeus	
Gaybrook Transect 8	N4755044 350	2475 50	24435 0	Nyctalus leisleri	
Littlewood	N529479	2529 00	24790 0		
N11 (3) 2003-	N3570034 700	2357 00	23470 0	Pipistrellus pygmaeus,Nyctalus leisleri,Plecotus auritus,Pipistrellus pipistrellus (45kHz),Pipistrellus spp. (45kHz/55kHz),Pipistrellus nathusii	
N11 (4) 2003-	N3980032 900	2398 00	23290 0	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz),Pipistrellus spp. (45kHz/55kHz),Myotis spp.,Unidentified bat,Pipistrellus pygmaeus,Plecotus auritus,Pipistrellus nathusii	
Newells Bridge Transect	N3830042 300	2383 00	24230 0	Myotis daubentonii,Unidentified bat,Myotis natterreri,Pipistrellus spp. (45kHz/55kHz)	
Royal Canal, Coralstown	N5478749 802	2547 87	24980 2	Myotis daubentonii	
The Downs Kinnegad Transect	N5008550 707	2500 85	25070 7	Myotis daubentonii,Unidentified bat,Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus	
Ad-hoc observations					

Survey	Grid reference	Grid ref easting	Grid ref northing	Date	Species observed
Ad Hoc Records collected during Monitoring	N356396	235600	239600	8/8/2012	Nyctalus leisleri,Pipistrellus spp. (45kHz/55kHz)
Ad Hoc Records collected during Monitoring	N3950051100	239500	251100	8/10/2012	Pipistrellus pipistrellus (45kHz)
Bat Conservation Ireland Bat Walks	N3951	239000	251000	5/17/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus spp. (45kHz/55kHz),Nyctalus leisleri,Myotis daubentonii
Bat Survey - Scott Cawley	N503511	250300	251100	9/2/2008	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri,Myotis daubentonii,Pipistrellus pygmaeus
Bat Surveys - Tina Aughney	N4854444585	248544	244585	5/10/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis spp.
Bat Surveys - Tina Aughney	N4838244470	248382	244470	5/10/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
Bat Surveys - Tina Aughney	N4585944383	245859	244383	5/10/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
Bat Surveys - Tina Aughney	N4582944718	245829	244718	5/10/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Myotis spp.
Bat Surveys - Tina Aughney	N4617845310	246178	245310	5/10/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus spp. (45kHz/55kHz),Nyctalus leisleri,Myotis spp.,Plecotus auritus
Bat Surveys -	N4578745519	245787	245519	5/11/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus

Tina Aughney					pygmaeus,Pipistrellus spp. (45kHz/55kHz),Nyctalus leisleri,Plecotus auritus
Bat Surveys - Tina Aughney	N4608745 503	246087	245503	5/11/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus spp. (45kHz/55kHz),Myotis spp.
Bat Surveys - Tina Aughney	N4604145 346	246041	245346	5/11/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus spp. (45kHz/55kHz),Nyctalus leisleri,Myotis spp.,Plecotus auritus
Bat Surveys - Tina Aughney	N4563144 981	245631	244981	5/29/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus spp. (45kHz/55kHz)
Bat Surveys - Tina Aughney	N4545045 610	245450	245610	5/29/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus spp. (45kHz/55kHz),Nyctalus leisleri
Bat Surveys - Tina Aughney	N4594045 022	245940	245022	5/29/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus spp. (45kHz/55kHz),Myotis spp.,Pipistrellus nathusii
Bat Surveys - Tina Aughney	N4582444 688	245824	244688	5/29/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis spp.,Pipistrellus nathusii
Bat Surveys - Tina Aughney	N4794143 314	247941	243314	6/2/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
Bat Surveys - Tina Aughney	N4802843 404	248028	243404	6/2/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus spp. (45kHz/55kHz),Myotis spp.,Nyctalus leisleri
Bat Surveys - Tina Aughney	N4781143 605	247811	243605	6/2/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis spp.
Bat Surveys -	N4767243 091	247672	243091	6/2/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus spp.

Tina Aughney					(45kHz/55kHz),Nyctalus leisleri
Bat Surveys - Tina Aughney	N4745843302	247458	243302	6/9/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
Bat Surveys - Tina Aughney	N4799146474	247991	246474	6/9/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis spp.
Bat Surveys - Tina Aughney	N4756446482	247564	246482	6/9/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
Bat Surveys - Tina Aughney	N4768943088	247689	243088	6/9/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
BATLAS 2010	N384424	238400	242400	5/18/2009	Myotis daubentonii,Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Plecotus auritus
BATLAS 2010	N416377	241600	237700	5/18/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis spp.
BATLAS 2010	N486388	248600	238800	5/18/2009	Pipistrellus pygmaeus,Myotis daubentonii
BATLAS 2020	N4148537849	241485	237849	7/11/2018	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri
BATLAS 2020	N4852938884	248529	238884	7/11/2018	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri
BATLAS 2020	N3561939691	235619	239691	7/2/2018	Pipistrellus pygmaeus,Myotis daubentonii
BATLAS 2020	N4069040998	240690	240998	6/9/2016	Pipistrellus pygmaeus,Nyctalus leisleri
BATLAS 2020	N4000041500	240000	241500	########	Pipistrellus pygmaeus
BATLAS 2020	N5139242081	251392	242081	9/26/2018	
BATLAS 2020	N4332042304	243320	242304	########	Pipistrellus pipistrellus (45kHz),Pipistrellus spp. (45kHz/55kHz)

BATLAS 2020	N4332042304	243320	242304	6/9/2016	Pipistrellus spp. (45kHz/55kHz)
BATLAS 2020	N3840642325	238406	242325	6/1/2016	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
BATLAS 2020	N3840642325	238406	242325	10/1/2015	Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii
BATLAS 2020	N4421042340	244210	242340	########	Pipistrellus pygmaeus
BATLAS 2020	N4421042340	244210	242340	6/9/2016	
BATLAS 2020	N3714943687	237149	243687	10/1/2015	Pipistrellus pygmaeus
BATLAS 2020	N3714943687	237149	243687	6/1/2016	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
BATLAS 2020	N3737443687	237374	243687	6/1/2016	Pipistrellus pygmaeus
BATLAS 2020	N3737443897	237374	243897	10/1/2015	Pipistrellus spp. (45kHz/55kHz)
BATLAS 2020	N3681747434	236817	247434	########	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri
BATLAS 2020	N3971948437	239719	248437	########	Pipistrellus pygmaeus
BATLAS 2020	N5288849234	252888	249234	9/26/2018	Pipistrellus pipistrellus (45kHz)
BATLAS 2020	N5453649795	254536	249795	9/26/2018	
BATLAS 2020	N4193950096	241939	250096	7/27/2016	Pipistrellus pygmaeus,Nyctalus leisleri,Myotis spp.
BATLAS 2020	N5010550681	250105	250681	6/16/2015	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii
BATLAS 2020	N5010550681	250105	250681	6/16/2015	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii
BATLAS 2020	N3887251054	238872	251054	7/27/2016	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii
BATLAS 2020	N4074451303	240744	251303	7/27/2016	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus

BATLAS 2020	N4716651306	247166	251306	5/23/2017	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
National Biodiversity Data Centre Bat Records	N529479	252900	247900	5/18/2014	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
National Biodiversity Data Centre Bat Records	N373342	237300	234200	7/27/2013	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
National Biodiversity Data Centre Bat Records	N375342	237500	234200	7/27/2013	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
National Biodiversity Data Centre Bat Records	N375342	237500	234200	8/20/2013	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
National Biodiversity Data Centre Bat Records	N376343	237600	234300	8/20/2013	Plecotus auritus,Pipistrellus pygmaeus,Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
Wildlife Surveys Ireland Surveys	N3704049149	237040	249149	8/3/2023	Nyctalus leisleri