Bats in Ballinora

Phase 1: Preliminary desktop research

Ballinorna and District
Community Association Ltd

Contents

Bats in Ballinora

The aim of ‘Bats in Ballinora’ is to confirm sightings of bats in Ballinora and Waterfall. We want to record where bats live and the species.

The project has 2 phases.

Phase 1

Phase 1 is to complete desktop research. Our desktop research will:

- give an introduction to bats and the laws protecting them
- profile the species of bats that live in Ireland
- find out which habitats bats are most likely to live in - and suggest an area for field research

Phase 2

Phase 2 is a field research. We’ll:

- find out which bat species are living in the area, and record them
- map the locations they’re found in

We’ll use an Echo Meter Touch 2 Pro. This bat detector will let us listen to, identify and record bats.

We’ll carry out field research in late Spring to Autumn 2021 - this is when bats are most active.

We may need extra funding and expert help with the project. for example, if we need to estimate local bat population or identify bat roosts.

Bat survey

Local people have seen bats:

- along the Curraheen Road near the Grotto
- in the Glenn/Curraheen River area
- along Bothar Na Chepael/Ballinora Cross
- in Ballinora village
- by Jimmy's Cross and Greybrook

The area we want to survey is in the 2km grids W66D and the south part of W66E.

We checked the Bat Conservation Ireland and Biodiversity Ireland databases. We could not find a record of bats in the area we want to use for a survey.

We did find a record of bats in the 10km grids W56 and W66 which are next to our survey site.

There is a record of the following bats at the W56 10km grid:

- Brown long-eared bat
- Soprano pipistrelle
- Daubenton's bat
- Lesser horseshoe bat
- Leislers bat
- Pipistrelle nathusius
- Common pipistrelle

There is a record of the following bats at the W66 10km grid:

- Soprano pipistrelle
- Common pipistrelle
- Daubenton's bat
- Nyctatus leisleri

There is also a record of Long haired bats in the UCC Curraheen campus which is close to the study location.

Bat survey location

The study area is about 6km^2. It's in the parish of Ballinora, about 6km west-south-west of Cork City. It is in the 2km grid reference W66D and 50% of the southern end of W66E.

The area covers the Grotto at Curraheen to Maglin Bridge to Jimmy's Cross to Ballymah. It includes an area of the the Curraheen River basin.

The boundaries are:

- the L2222 Curraheen Road in the north
- the L2203 The Waterfall Road in the south
- the L2225 and L2220 in the west

We chose this area because we're already mapping the habitats in there. It means we'll have information about wildlife in the area too. This will help us to understand the ecology of the area better.

We have mapped 1 area to Fossitt Level 3, and will map another to Fossitt Level 2 or 3.

The habitats we know to be good for bat species living in Ireland are:

- fresh water and watercourses (FW)
- improved agricultural grassland (GA1)
- semi-natural woodland (WN)
- scrub and transitional woodland (WS)
- highly modified non-native woodland (WD)
- hedgerows (WL1)
- treelines (WL2)
- stone walls and other stonework (BL1)
- buildings and artificial surfaces (BL3)

Bats: an introduction

Bats are the only animal in the family Chiroptera. There are more than 1,200 species of bat worldwide.

Many bat species - including all species in Ireland - use sound to find their way in the dark and hunt for food. This called echolocation.

In tropical climates, bats have evolved to eat fruit, insects, vertebrates and blood. In cooler climates - including Ireland - they only eat insects.

Ireland's bats live in a the range of habitats and play an important role in the ecosystem. They eat insects such as mosquitoes, greenfly and other crop-eating insects. This means there's less need for pesticides in areas with a strong bat population.

Some types of bat are 'indicator species'. This means they can tell us about the health of the area they live in. They help us to:

- find out about the health of a habitat
- predict problems that might happen in a habitat
- stop the loss of species from a habitat

Bats live in roosts, and they need different conditions throughout the year. For example, in summer, female bats gather in a maternity roost. In winter, bats use a hibernation roost.

Bat live in habitats with large populations of insects. They hunt in places insects use for shelter. For example, woodland edges, hedgerows, rivers and tree lines.

Bats are most active during summer - which is when they give birth and raise their young.

Bats: a protected species

The laws that protect bats and their breeding sites are:

- The Wildlife Act (1976)
- Wildlife Amendment Act (2000)
- The EU Habitats Directive (92/43/EEC)
- European Communities Natural Habitats Regulations 1997
- Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) Appendix II
- Agreement on the Conservation of Populations of European Bats (EUROBATS)
- Wildlife (N.I.) Order of 1985

The EU Habitats Directive lists Irish bats in Annex IV and the Lesser Horseshoe bat in Annex II.

Why monitor bats?

Bats are harmless and avoid human contact if they can.

They make up about 20% of our mammal species. Bat numbers are in decline. Some species are ‘threatened’ or ‘endangered’ so we have laws to protect them.

Bats play an important role in their habitats. They’re the only major predator of night-flying insects, and can eat up to 1,000 insects in an hour.

Losing bats would cause serious damage to the ecosystem. There would be no natural control of the insect population. This could lead to crop damage, economic damage and illness.

Bats live in a wide range of habitats. They promote biodiversity and support the health of their ecosystems.

They tell us about the health of their habitat because they're sensitive to change in the way we use land. We can use them to measure change in biodiversity - in the same way as we can birds, butterflies and hoverflies.

Factors affecting bat populations

The major threats to bat populations are:

- losing their habitat to building development
- changes to the way we farm
- climate change
- using insecticide
- wind turbines

Building developments take land bats live in or they create spaces between habitats. It means fewer places to roost and find food.
Bats in Ireland eat insects or small invertebrates. Bat species have adapted to hunt food in different ways or in different habitats.

For example, some bats:

- catch small insects when they're flying
- catch large insects like moths and beetles
- pick insects off foliage or spider webs

The largest populations of bats live in wetland and woodland edges. These are places with the most insects.

Bats move between roosts and feeding areas, but they dislike wide-open spaces. They fly long distances to avoid gaps in hedgerows, tree lines, fencing, or waterways.

Changes to farming have led to less diversity and lower numbers of insects. This is damaging to bat populations because bats in Ireland only eat insects. These changes are things like:

- draining ditches and ponds
- removing hedgerows and tree lines
- changing hay to silage

Climate change may also influence insect life cycles and when bats can feed.

Bat numbers will recover if we manage their habitats and make new ones. Planting ‘night gardens’ makes sure habitats attract night pollinating insects like moths. Night gardens have light-coloured flowers that bloom late in the day. The flowers reflect the moon’s light and release scent in the evening.

It’s important to make sure bat habitats are good places for insects to live and lay larvae. We can do this by:

- managing trees, shrubs, and hedgerows
- turning deadwood into log piles
- looking after ponds and marshy areas
- making sure there is grass
- using less insecticide

We also need to inform the local community and get them involved.

Echolocation

Bats are not blind. They’re active at night (nocturnal) and use sound and echos to find their way and hunt for food.

Bats make high-frequency sounds (ultrasound) that bounce off objects and return an echo. They listen for the echo and it tells them where things are. This is echolocation.
The echos tell them about the area they’re flying in. They also tell the bat about

the prey they're hunting. It tells them about:

- size
- distance
- speed
- the direction prey is flying

We cannot hear the sound bats make because the frequency (pitch) is too high. Normal human hearing rarely goes above 20kHz. The sounds a bat makes range in frequency from 20kHz to 200kHz.

We can hear and record the high-frequency sounds with bat detectors. Bat detectors pick up bat calls and turn them into a pitch humans can hear.

Each bat species has a different frequency. The frequency relates to their size, flight behaviour, environment, and prey types. This means that bat detectors can help to identify different species.

Bats species in Ireland

Ireland has 9 small species of bats. They all eat insects and spiders.

8 of the species are in the family Vespertilionidae, and 1 is in the family Rhinolophidae.

Family Vespertilionidae

This family has a simple nose and a flap of skin outside the ear (tagus). The flap of skin directs sound into their ear. It helps the bats find the position of prey when they are flying. The 8 species living in Ireland are:

- Common pipistrelle (pipistrellus pipistrellus)
- Soprano pipistrelle (pipistrellus pygnaeus)
- Nathusius pipistrelle (pipistrellus nathuesii)
- Leisler's bat (nyctalus leisleri)
- Brown long-eared bat (plecotus auritus)
- Daubenton's bat (myotis daubentonii)
- Whickered bat (myotis mystacinus)
- Natterer's bat (myotis nattereri)

Family Rhinolophidae

Bats in this family have a more complex nose. It has flaps of skin (noseleaf) in a horseshoe shape around its nostrils. They make a sound (echolocation calls) from their nose. The flaps of skin help the bats to aim the sound and shield their ears from the noise.

They cannot land and crawl like other species.

The only species of this family living in Ireland is the:

- Lesser Horseshoe bat (rhinolophus hipposideros)

There are records of other bat species living in Ireland. But, they do not live here in permanent populations.

There are records of:

- Brant's bat
- Greater Horseshoe bat

Habitat Suitability Index (HSI)

A HSI is a score that tells us how good a habitat is for a species. The score ranges from 0 (least favourable) to 100 (most favourable). A HSI looks at what the habitat has to offer a species, and what a species needs to survive.

HSIs help us:

- understand the spread of a species when we do not have much data
- find out which sites are best for a species to live in
- predict the impact of climate change or to the way we manage habitats

The National biodiversity data centre have HSIs for each bat species living in Ireland. We can use them to find out if bats are likely to live in our study area. The HSIs use records from the Irish National Bat database. Bat Conservation Ireland look after the database.

A Habitat Suitability Map (HSM)

HSMs also show how good habitats are for a species. They help predict the spread of a species in an area and the spread over time. They're made with specialised software programmes - such as MaxEnt.

They use:

- environmental data
- records of echolocation calls and bats in the area
- information about the features of the land (topography)

HSMs are out of scope for this project.

Bat profiles

9 bat species live in Ireland. Each bat species has an individual profile to help with identification and to understand the likely location or habitat they will be found.

By using bat species profiles, local habitat types, current bat databases and the HSI, we can understand the probability of finding a species of bat in the study area.

The bat species profiles are in the order they're most likely to be found in the study area.

Soprano pipistrelle

(Pipistrellus pygmaeus)

Image by Evgeniy Yakhontov

Echolocation call frequency

Range 55-85kHz Peak 55kHz

Distribution

Widespread and common

Habitat

Seminatural woodland (WN)
Mixed broadleaved woodland (WD1)
Mixed broad broadleaved or conifer woodland (WN2)
Buildings and artificial surfaces (BL3)
Hedgerows (WL1)

Habitat Sustainability Index

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Common pipistrelle

(Pipistrellus pipistrellus)

Image by Drahkrub

Echolocation call frequency

Range 45-70kHz Peak 45kHz

Distribution

Widespread at local level

Habitat

Seminatural woodland (WN)
Mixed broadleaved woodland (WD1)
Mixed broad broadleaved/conifer woodland (WN2)
Stone walls and stonework ((BL1)
Buildings and artificial surfaces (BL3)
Hedgerows (WL1)
Non marine caves (EU1)
Artificial underground habitats (EU2)

Habitat Sustainability Index

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Brown long-eared bat

(Plecotus auritus)

Image by Jasja Dekker

Echolocation call frequency

Range 25-50kHz Peak 35kHz

Distribution

Widespread

Habitat

Seminatural woodland (WN)
Highly modified non native woodland (WD)
Scrub/transitional woodland (WS)
Scrub (WS1)
Horticultural land (BC2)
Stone walls and stonework (BL1)
Buildings and artificial surfaces (BL3)

Habitat Sustainability Index

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Leisler's bat

(Nyctalus leisleri)

Image by Wildlife Wanderer

Echolocation call frequency

Range 15-45kHz Peak 25kHz

Distribution

Widespread (Ireland is important for species)

Habitat

Semi natural woodland (WN)
Mixed broadleaved woodland (WD1)
Mixed broad broadleaved/conifer woodland (WN2)
Buildings and artificial surfaces (BL3)
Fresh water (FW)

Habitat Sustainability Index

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Natterer's bat

(Myotis nattereri)

Image by MissMhisi

Echolocation call frequency

Range 35-80kHz Peak 50kHz

Distribution

Widespread - local distribution

Habitat

Semi natural woodland (WN)
Highly modified non native woodland (WD)
Linear woodland scrub (WL)
Scrub/transitional woodland (WS)
Improved agricultural grassland (GA1)
Stonewall and stonework (BL1)
Building and artificial surfaces (BL3)
Non marine caves (EU1)
Artificial underground habitats (EU2)
Fresh water (FW)

Habitat Sustainability Index

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Daubenton's bat

(Myotis daubentonii)

Image by Rauno Kalda

Echolocation call frequency
Range 35-85kHz Peak 45-50kHz

Distribution
Widespread

Habitat
Semi natural woodland (WN)
Highly modified non native woodland (WD)
Buildings and artificial surfaces (BL3)
Lakes and ponds (FL)
Fresh water (FW)

Habitat Sustainability Index
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Whiskered bat

(Myotis mystacinus)

Image by Gilles San Martin

Echolocation call frequency

Range 32-89kHz Peak 45kHz

Distribution

Widespread – patchy distribution

Habitat

Semi natural woodland (WN)
Mixed broadleaved woodland (WD1)
Mixed broadleaved/conifer woodland (WD2)
Scrub/transitional woodland (WS)
Linear woodland scrub (WL)
Improved agricultural grassland (GA1)
Scrub/transitional woodland (WS)
Stonewalls and stonework (BL1)
Building and artificial surfaces (BL3)
Non marine caves (EU1)
Artificial underground habitats (EU2)
Fresh water (FW)

Habitat Sustainability Index

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Nathusius pipistrelle

(Pipistrellus nathusius)

Image by Mnolf

Echolocation call frequency

Range 36-40kHz Peak 38kHz

Distribution

Mainly North east of Northern Ireland

Habitat

Mixed broadleaved woodland (WD1)
Scattered trees and parkland (WD5)
Riparian woodland (WN5)
Lakes and ponds (FL)
Fresh water (FW)

Habitat Sustainability Index

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Lesser horseshoe bat

(Rhinolophus hipposideros)

Image by Alexandre Roux

Echolocation call frequency

Range 32-89kHz Peak 45kHz.

Distribution

Mainly West and South West of Ireland

Habitat

Semi natural woodland (WN)
Mixed broadleaved woodland (WD1)
Mixed broadleaved/conifer woodland (WD2)
Stonewalls and stonework (BL1)
Building and artificial surfaces (BL3)
Non marine caves (EU1)
Artificial underground habitats (EU2)
Fresh water (FW)

Habitat Sustainability Index

1

Conclusions

1. People have seen bats in the area but the bat species are not identified or recorded.

2. We can match bat species profiles to the areas we've mapped in our habitat mapping project. This will tell us how likely it is that we'll find bats.

3. The Habitat Suitability Index for a bat species is a strong sign of whether we'll find bats in a habitat. The higher the index, the more likely we'll find a particular species.

4. There are records of bats in the areas next to the study area (within the 10km square grids). These are a strong sign that bat species are likely to live in the study area.

5. If bats are widespread throughout Ireland, they're likely to live within the area of the study.

We'll begin Phase 2 of our Bats in Ballinora project during the summer when bats are most active.

We'll use our Echo Meter Touch 2 Pro bat detector and recorder.

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