PHASE 2

Bats in Ballinora

GRANT AIDED BY CORK COUNTY COUNCIL

BATS IN BALLINORA PHASE 2

Preliminary assessment of the presence and species of bats detected in Ballinora/Waterfall.

Bats in Ballinora Phase 2 is the follow up to Phase 1 of our Bats in Ballinora project. Phase 1, a desktop study as to the likelihood of finding bats locally, was prompted by reports from local walkers seeing bats flying at sunset. Results from a Fossitt Level 3 Habitat Mapping project, which identified general species specific bat habitats and a study of the bat Habitat Suitability Index for the area, bounded by the Curaheen Grotto to Maglin on to Jimmie's Cross to Ballymah (see appendix 1) suggested that a broad range of bat species could be present.
Phase 2 set out to confirm the presence of bats and to identify their species within this area, in so far as it is possible.

Using an Echometer Touch 2 Pro bat detector (see appendix 2) to survey the area we can confirm the following:

1. bats have been detected throughout the Ballinora/Waterfall district,
2. seven out of the nine bat species, considered to be resident in Ireland, were detected and provisionally identified over the period 05th August to 20th August 2021. The following bats were detected:

Common Pipistrelle	(Pipistrellus Pipistrellus)
Soprano Pipistrelle	(Pipistrellus Pygmaeus)
Leislers Bat	(Nycalus Leisleri)
Natterer Bat	(Myotis Nattereri)
Whiskered Bat	(Myotis Mystacinus)
Nathusius Bat	(Pipistrellus Natusii)
Brown Long Eared Bat	(Plectotus Auritus).

The remaining two resident bat species in Ireland which have not been detected so far are:

Daubentons Bat	(Myotis Daubentonii)
Lesser Horseshoe Bat	(Rhinolophus Hipposideros)

The scope of the project was limited to a preliminary ecological appraisal carried out at a Citizen Science level of expertise.

BACKGROUND.

The study was confined to public roads which were divided into various predetermined walked routes or transects of various lengths (see appendix 3). The manual bat activity surveys involved walking the predetermined transects, twice on the same night, to observe, listen and record bats in flight using the hand held Echometer bat detector and recorder.
Data from transect surveys is used to produce an index of bat activity. Activity indices provide an indication of how bats make use of an area and cannot be related to or used to infer bat abundance or population density. Each visit began at sunset and continued for up to 70 minutes depending on the length of the transect.

SURVEY CONDITIONS.

Bats are mainly active through Spring over the Summer into the Autumn and tend to hibernate from late Autumn over the Winter into early Spring. Their activity can vary greatly from season to season and is generally affected by temperature and weather conditions.

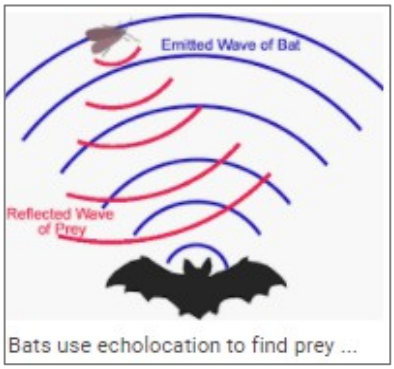
Optimal conditions for dusk bat surveys:

1. sunset temperature 10 deg centigrade or above
2. no rain
3. no strong wind.

In cooler weather or windy conditions bats may not emerge, emerge later or forage for shorter periods, carry out fewer foraging bouts or use more sheltered habitats.

The Bats in Ballinora surveys were conducted from dusk in dry calm conditions with temperatures between 10 and 14 deg. Centigrade over the period 05th August to 20th August 2021.

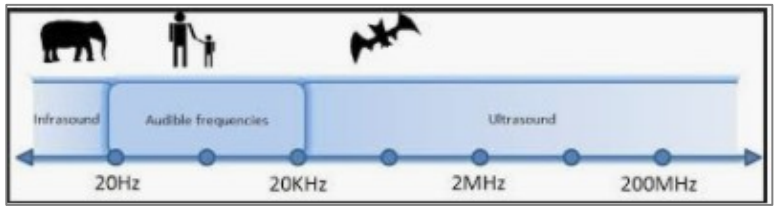
ECHOLOCATION CALLS.



Bats use echolocation to find prey ...

Bats have a very unique ability. They can echolocate. Aerial foraging insectivorous bats, constitute the bat population in Ireland, use echolocation to navigate and find insect prey. They do this by periodically emitting a sequence of ultrasonic sounds (above 20kHz) at frequencies (pitch) which humans cannot hear called echolocation calls and listening for the returning echo. The returning echo of the call sequence builds up an acoustic image of its surroundings and provides information on size, shape, location and movement of objects in the environment, crucial for navigation and finding prey. Bat calls differ between species which likely ensures each species has its own bandwidth. The

echolocation call differences between species means that ultrasonic detectors are not only valuable in recording the presence of bats but also allow us to determine which species is present. Call features such as frequency, bandwidth, duration and pulse interval are all related to the ecological niche occupied by bats. Echolocation calls have been shown to be the most intense sounds produced by animals



Detecting bat species depends on call intensity (loudness) and frequency (measured in kHz kilohertz) of typical echolocation calls. The frequency differences of the calls can be used to identify individual bat species. Bats emit calls from about 20kHz to 160kHz and different species of bats use different portions of this range of frequencies. The sound waves emitted by bats bounce off objects within their environment and return to the bats ears which are tuned to recognise their own unique calls. Each bat species has its own characteristic echolocation frequency or frequency range typical of a given bat species which allows us to identify individual species by recording and interpreting their echolocation calls. Calls can be varied and can be adapted depending on bat behaviour and the surrounding habitat.

The higher frequencies are quickly absorbed in air which limits the range within which bats emitting high frequency calls can be detected. Mid range frequency calls of in the region of 50kHz the detection range is in the region of 25 to 30 meters in average atmospheric conditions. Generally detection of echolocation bat calls decreases with humidity. In misty conditions the maximum detection range can be low.

BAT SURVEYS.

Acoustic surveys, using bat detectors, help to identify bat species and provides an index of bat activity rather than an absolute number of bats in a given space and time. Actual numbers of individuals cannot easily be established unless the acoustic data is coupled with observations in the field by an experienced ecologist.

Bat activity is recorded as a bat pass which is the string of one or more bat pulses (echolocation calls) with less than a 1 second interval between sequential calls. The level of bat activity (number and frequency of bat passes) is related to the relative abundance of the bat population at a given date and time. High activity – bats relatively plentiful, low activity – bats are relatively rare or uncommon. The number of bat passes is an index of bat activity rather than a measure of individual bats in a population. Bat activity indices per survey can be described as indices of the amount of use bats make of an area and used to quantify bat activity for a specific space and time but not bat numbers.

For example 10 bat passes could be made by a single bat or could be made by several bats. Some species such as Pipistrelles will continuously fly around a habitat and

therefore it is likely that a series of bat passes within a similar time frame is one individual bat. On the other hand Leislers Bats fly quickly and a bat pass is more likely to be indicative of one individual bat. Relative abundance of bats can only be estimated coarsely e.g. we can conclude bats and bat species are common, uncommon or rare for a given survey.

At dusk some bats emerge earlier than others.

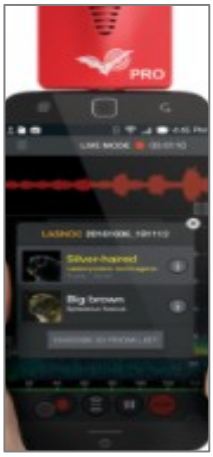
EARLY EMERGERS	LATER EMERGERS
Leislers Bat	Whiskered Bat
Common Pipistrelle	Natterers Bat
Soprano Pipistrelle	Whiskered Bat
Natusius Pipistrelle	Natterers Bat
	Brown Long Eared Bat
	Daubentons Bat
	Lesser Horseshoe Bat

BAT FIELD SURVEY.

The bat field survey, to confirm the presence of bats and identify their species, was carried out in the parish of Ballinora Co Cork located within the 2 km grid references W66D and bottom 50% of grid reference W66E of the Biodiversity Maps National Grid.
For details of the survey area see appendix 1.
The survey was carried out on the evenings between 05.08.2021 and 20.08.2021 just before and extended after sunset.
The weather conditions on each evening were ideal for the survey being dry, calm, mostly clear and at a temperature of between 10 and 14 degrees centigrade.

The location of the survey, extending to approximately 6 sq.kms, was divided into walking transects or sections and was restricted to the public road network within the area. Each evening transect bat survey was walked over and back i.e. twice, over a period of between 30 and 70 minutes depending on the length of the transect.
For transect locations and individual survey results see appendix 3.

BAT DETECTING EQUIPMENT.



To convert the ultrasound produced by bats and converted into sound that we can hear and to detect and identify the bats during our survey, we used a combination of a downloaded Wildlife Acoustics app (which allows us to listen to, record and automatically identify bats by their echolocation calls) and the Echometer Touch 2 Pro bat meter attached an appropriate recorder i.e. a smart phone.
For Echometer Touch 2 Pro details and settings see Appendix 2.

SURVEY RESULTS.

The survey set out to answer the following questions:

(1) are there bats in Ballinora and
(2) can we identify their species?

The results of the survey conducted over seven evenings and during the period 09.08.2021 to 20.08.2021 is presented as the total number of bat passes by the identified species over 6 walking transects and static surveys. The individual bat pass data for each transect can be found in appendix 3.

Total number of bat passes by species recorded within the project area.

BAT SPECIES	RECORDED BAT PASSES
Common Pipistrelle (Pipistrellus Pipistrellus)	568
Soprano Pipistrelle (Pipistrellus Pygamaeus)	192
Leislers Bat (Nyctalus Leisleri)	76
Natterers Bat (Myotis Nattereri)	5
Nathusius Bat (Pipistrellus Nathusii)	5
Brown Long Eared Bat (Plecotus Auritus)	3
Whiskered Bat (Myotis Mystacinus)	3

NOTE: Four recordings (passes) of the Barbastelle Bat (Barbastella Barbastellus) were noted and must be regarded as suspicious. This bat has not been recorded in Ireland excepting for one or two possible instances in the 1990's. Further surveys are required to confirm or otherwise the validity of these recordings.

Since the Barbastelle bat has not been formally recorded in Ireland and as a consequence the recordings must be viewed as suspicious a bat ecologist has been consulted and was of the opinion that "social calls of Pipistrelles might be misidentified by the echometer as Barbastelles". In due course the recordings will be sent to the British Trust for Ornithology (BTO) for sonogram analysis to verify or otherwise the recordings.

SURVEY LIMITATIONS.

The bat survey was carried out at Citizen Science and at a continuous learning level of expertise.

The survey was limited to walking transepts along public roads and did not include bat surveys within farmland bordered by the project area road network, neither were formal controlled static surveys included in the programme.

CONCLUSIONS.

As a result of the bat survey we can confirm that there are bats in Ballinora and we can provisionally identify seven bat species detected within the limits of the expertise employed and the interpretation of the echolocation signals recorded on the Echolocation bat meter.

THE FUTURE WHAT'S NEXT?

PHASE 3.

For consideration in 2022, funding and expertise being available, the baseline survey will be followed up, where practicable, by:

(1) a more detailed survey to be carried out by a competent ecologist to validate the monitoring recordings and confirm the findings of Phase 2 which was carried out at a Citizen Science level of expertise.
(2) an estimation of the local bat population by species
(3) identification of local bat roost sites
(4) locating and monitoring of current and new bat boxes
(5) replanting of damaged hedgerows, subject to landowner permission
(6) where possible, preservation and improvements to the environment and habitats used by bats.

A contact has been established with an ecologist who has indicated a willingness to become involved in further work in 2022 on our Bats in Ballinora project.

APPENDIX 1.

STUDY LOCATION.

The study area of approximately 6 Sq Km is located within the parish of Ballinora, approximately 6 km WSW of Cork City, within the 2km grid reference W66D and 50% of the southern end of W66E.

The area is locally identified as being within the area enclosed by the
Grotto at Curraheen (coordinates 51,52,17N 8,33,59W)
Maglin Bridge (coordinates 51,52,15N 8,33,21W)
Jimmie's Cross (coordinates 51,50,50N 8,34,30W)
Ballymah (coordinates 51,51,47N 8,33,12W)

It is bounded to the north by the L2222 Curraheen Road to the South and East by the L2203 The Waterfall Road and on the West by the L2225 and L2220 and includes an area comprising a major portion of the upper reaches of the Curraheen River basin.

The location of the bat survey, coincides with that of our Habitat Mapping project, and will generate data to feed into our Nature and Biodiversity project adding to the knowledge of our local wildlife.

APPENDIX 2

BAT METER.

The recently purchased Wildlife Acoustics ECHOMETER TOUCH 2 PRO bat meter was used to identify and record bats in Phase 2 of the Bats in Ballinora project.
We used a combination of a downloaded Wildlife Acoustics bat detector app (which allows us to listen to, record and automatically identify bats by their echolocation calls) and the Echometer Touch 2 Pro bat meter attached to the HTC ONE M9 android smart phone for 90% of the survey and to the XAOMI MiA2 smart phone with ARKTEK micro USB to USB-C adapter for 10% of the survey.

The Echometer Touch 2 Pro when attached to the Wildlife Acoustic bat detector app and the smartphone recording equipment, which for our survey is set to the Real Time Expansion setting (RTE), translates the ultrasonic sounds (bat echolocation calls) to a range that is audible to humans by taking tiny snippets of the ultrasound, digitally storing the ultrasound signal and replaying it at a slower speed, typically at ten times slower i.e. a frequency of 50kHz is lowered to 5kHz which is within our hearing range. The RTE setting will detect all frequencies across the frequency range within which bats are likely to be calling in real time and will record a graphic display of the sound (sonogram) made by bats..
Other settings, on the bat meter are available such as the Heterodyne mode (HET) which will only tune into set frequencies and was not in use for this project. As the HET setting can only be tuned to one frequency at a time it is possible to miss other bats flying past.

ECHOMETER TOUCH 2 SETTINGS.

App bat detector version 2.8.3.
Auto ID set to European and UK bats.
Frequency settings 20kHz to 120 kHz.
Recording CONTINUOUS.
Audio Division Ratio 1/20 RTE.
Real Time Auto ID ON.
Noise files switch OFF.
Real Time Auto ID Sensitivity setting SENSITIVE.
Trigger Sensitivity MEDIUM.
Trigger Window 3 SECONDS.
Max Trigger Length 15 SECONDS.
Sample Rate 256K.
Advanced Settings DEFAULT for this project.

APPENDIX 3

BATS IN BALLINORA TRANSEPT SURVEY RESULTS. TRANSEPT (1)

DATE; 09.08.2021.
TIME : 9.45pm-10.18pm
TRANSEPT LOCATION :
START: 51,51,56N 8,34,35W BALLINORA CROSS.
FINISH: 51,51,58N 8,34,13W FITZGERALD'S CORNER.

CONDITIONS:
CLOUD; CLEAR SKY,
RAIN: DRY.
WIND: LIGHT BREEZE.
TEMPERATURE : 11deg. Approximately.

BATS DETECTED:

BAT SPECIES	NUMBER OF BAT PASSES.
Common Pipistrelle (Pipistrellus Pipistrellus)	63
Leislers Bat (Nyctalus Listleri)	7
Soprano Bat (Pipistrellus Pygamaeus)	5

MAIN HABITATS IN TRANSEPT:

Hedgerow WL1.
Tree line WL2.
Improved Agricultural Grassland GA1.

BATS IN BALLINORA TRANSEPT SURVEY RESULTS. TRANSEPT (2)

DATE; 11.08.2021.
TIME : 9.45pm-10.30pm
TRANSEPT LOCATION :
START: 51,52,17N 8,33,59W CURRAHEEN GROTTO.
FINISH: 51,51,58N 8,34,13W FITZGERALD'S CORNER.

CONDITIONS:
CLOUD; CLEAR SKY,
RAIN: DRY.
WIND: LIGHT BREEZE.
TEMPERATURE : 11deg. Approximately.

BATS DETECTED:

BAT SPECIES	NUMBER OF BAT PASSES.
Common Pipistrelle (Pipistrellus Pipistrellus)	55
Soprano Bat (Pipistrellus Pygamaeus)	46
Leislers Bat (Nyctalus Listleri)	9
Brown Long Eared Bat (Plecotus Auritus)	1

MAIN HABITATS IN TRANSEPT:

Hedgerow WL1.
Tree line WL2.
Improved Agricultural Grassland GA1.
Eroding Upland River FW1.
Scrub WS1.

BATS IN BALLINORA TRANSEPT SURVEY RESULTS. TRANSEPT (3)

DATE; 12.08.2021.
TIME : 9.46pm-10.37pm
TRANSEPT LOCATION :
START: 51,52,17N 8,33,59W CURRAHEEN GROTTO.
FINISH: 51,51,58N 8,34,13W BOITHRIN AN TSEIPEIL.

CONDITIONS:
CLOUD; CLEAR SKY,
RAIN: DRY.
WIND: BREEZE.
TEMPERATURE : 14deg. Approximately.

BATS DETECTED:

BAT SPECIES	NUMBER OF BAT PASSES.
Common Pipistrelle (Pipistrellus Pipistrellus)	82
Soprano Bat (Pipistrellus Pygamaeus)	17
Leislers Bat (Nyctalus Listleri)	5
Natterers Bat (myotis Nattereri)	1

MAIN HABITATS IN TRANSEPT:

Hedgerow WL1.
Stone Wall BL1.
Earth Bank BL2.
Improved Agricultural Grassland GA1.
Eroding Upland River FW1.

BATS IN BALLINORA TRANSEPT SURVEY RESULTS. TRANSEPT (4)

DATE; 13.08.2021.
TIME : 9.37pm-10.45pm
TRANSEPT LOCATION :
START: 51,51,56N 8,34,35W BALLINORA CROSS.
FINISH: 51,51,58N 8,34,13W WATERFALL.

CONDITIONS:
CLOUD; CLOUDY.
RAIN: DRY.
WIND: BREEZE.
TEMPERATURE : 13deg. Approximately.

BATS DETECTED:

BAT SPECIES	NUMBER OF BAT PASSES.
Common Pipistrelle (Pipistrellus pipistrellus)	56
Soprano Bat (Pipistrellus pygamaeus)	51
Leislers Bat (Nyctalus listleri)	19
Nathusius Bat (Pipistrellus nathusii)	3
Brown Long Eared Bat (Plecotus auritus)	1
Whiskered Bat (Myotis mystacinus)	1

The following bat detection is open to verification.

Western Barbastelle (Barbastella barbastellus) ??	1

MAIN HABITATS IN TRANSEPT:

Hedgerow WL1.
Tree Line WL2.
Stone Wall BL1.
Earth Bank BL2.
Built Land BL3.
Improved Agricultural Grassland GA1.
Eroding Upland River FW1.

BATS IN BALLINORA TRANSEPT SURVEY RESULTS. TRANSEPT (5)

DATE; 15.08.2021.
TIME : 9.40pm-10.50pm
TRANSEPT LOCATION :
START: 51,51,56N 8,34,35W BALLINORA CROSS.
FINISH: 51,51,00N 8,33,53W GREYBROOK.

CONDITIONS:
CLOUD; CLOUDY.
RAIN: DRY.
WIND: BREEZE.
TEMPERATURE : 11 deg. Approximately.

BATS DETECTED:

BAT SPECIES	NUMBER OF BAT PASSES.
Common Pipistrelle (Pipistrellus pipistrellus)	86
Soprano Bat (Pipistrellus pygamaeus)	65
Leislers Bat (Nyctalus listleri)	16
Brown Long Eared Bat (Plecotus auritus)	1
Whiskered Bat (Myotis mystacinus)	1

MAIN HABITATS IN TRANSEPT:

Hedgerow WL1.
Tree Line WL2.
Stone Wall BL1.
Earth Bank BL2.
Built Land BL3.
Improved Agricultural Grassland GA1.

BATS IN BALLINORA TRANSEPT SURVEY RESULTS. TRANSEPT (6)

DATE; 17.08.2021.
TIME : 9.10pm-9.46pm
TRANSEPT LOCATION :
START: 51,51,14N 8,35,21W MAGLIN.
FINISH: 51,51,56N 8,35,08W BALLYSHONEEN.

CONDITIONS:
CLOUD; CLOUDY.
RAIN: DRY.
WIND: BREEZE.
TEMPERATURE : 12 deg. Centigrade.

BATS DETECTED:

BAT SPECIES	NUMBER OF BAT PASSES.
Common Pipistrelle (Pipistrellus pipistrellus)	34
Soprano Bat (Pipistrellus pygamaeus)	2
Leislers Bat (Nyctalus listleri)	6
Natterers Bat (Myotis nattereri)	1

The following bat detections are open to verification.

Western Barbastelle (Barbastella barbastellus) ??	3

MAIN HABITATS IN TRANSEPT:

Hedgerow WL1.
Tree Line WL2.
Stone Wall BL1.
Earth Bank BL2.
Improved Agricultural Grassland GA1.

ADDITIONAL BAT RECORDINGS.

While setting up the Echometer bat detecting recorder and app the following additional bat pass recordings were made in the vicinity of Ballinora Cross.

BAT SPECIES	NUMBER OF BAT PASSES
Common Pipistrelle (Pipistrellus pipistrellus)	192
Soprano Pipistrelle (Pipistrellus pygmaeus)	6
Leislers Bat (Nyctalus leisleri)	14
Natterers Bat (Myotis nattereri)	3
Nathusius Bat (Pipistrellus nathusii)	2.