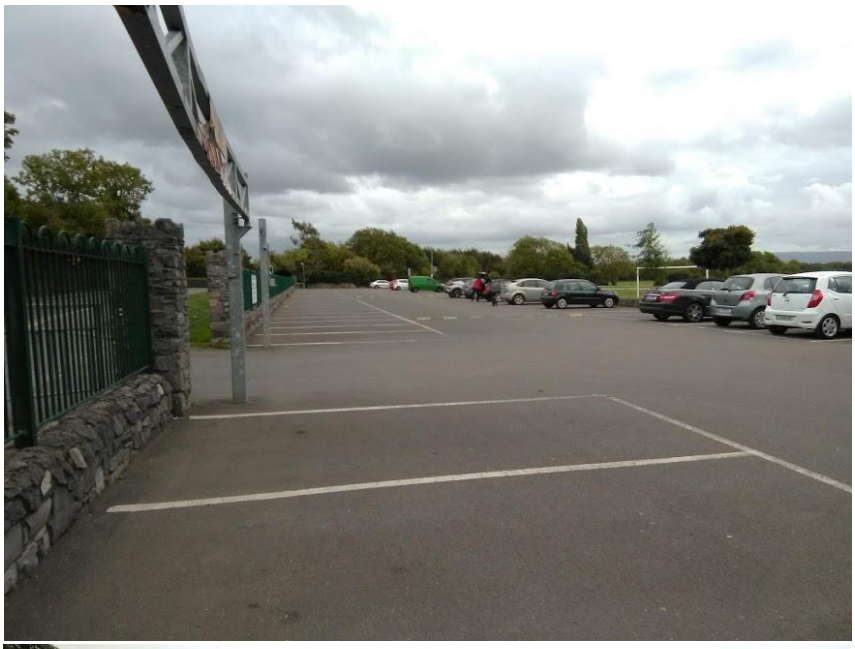
Porterstown Park

An Evaluation of the Bat Fauna and Potential Impacts of the Proposed Increase in Sports Amenities and Associated Lighting



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Introduction

Bats are a group of native mammals that may be affected unwittingly by human actions and many of the consequences are difficult to ascertain due to their extraordinary life cycle. Bats are nocturnal and crepuscular flying mammals that are typically found away from bright lights and daylight. No European bat species choose to fly in brightness and most bats avoid bright areas for a number of reasons; not least that they are more exposed to predation by birds and other species. In urban and suburban areas, this need for darkness can create a conflict with the needs or wishes of humans to illuminate their activities for various purposes.

Light is essential for humans to safely navigate and carry out their daily and nightly activities including travel and leisure. Lighting may be required where light levels will fall below a level that allows safe passage or safe performance of a task such as cycling, jogging or walking. This current project is focussed upon the provision of high intensity lighting to allow sports to be played within public sports grounds that lie within a Fingal public park.

Porterstown Park is a public park in the Porterstown / Diswellstown / Carpenterstown area in Fingal bounded by several golf courses such as Luttrellstown, Castleknock and farther afield Westmanstown and Hermitage as well as modern housing including Porterstown, Carpenterstown and Coolmine but also close to the River Liffey valley and the Phoenix Park.

Fingal County Council is currently applying for permission to provide an increased array of sports facilities including to erect sports lighting (floodlighting) to allow greater use of the facilities (current and proposed) in winter and night time in other seasons.

The purpose of this survey is to determine the species of bat present within the site and immediate area and what level of bat activity is present in the Park prior to any further changes towards concentrated sports amenities (see Figure 1). This will assist Fingal County Council in the development of a design for sports facilities and lighting with lower impact upon the bat fauna, if this is deemed to be necessary.

This assessment was undertaken in August 2018, a period when bat activity is high and when bats are moving from the maternity roosts and when males have established mating roosts and lekking areas.

To consider the potential impacts at Porterstown Park, it is necessary to examine the actual bat activity, bat species composition, timing of activity and spatial relationship of this to the proposed sports facilities and flood lighting. A once-off survey can provide relatively good information on the more commonly encountered species but cannot answer an annual use of the site. To counteract this, measures that would allow for other bat species that are seasonal or occasional in their presence may be appropriate.

Methodology

Equipment

Pettersson D240X (D240) heterodyne and time expansion bat detector

EchoMeter 3 (EM3) Time expansion detector with monitor

and SD card recording capacity and Garmin GPS attachment

Songmeter2Bat+ recording monitor (SM2)

with weatherproof case for longer-term monitoring externally

Kaleidoscope and Batsound 4.1 software

Head torch

Porterstown Park was examined for bat activity and evidence of roosting bats on 13th August 2018 with both an post-sunset and pre-sunrise evaluation. This involved the placement of a SM2 within the field proposed for the Cricket Oval and the carrying of the EM3 and D240. The entire perimeter was walked in addition to any hedgerow and areas of scrub making note of all bat activity encountered. The survey commenced at 20.45 hours at the car park at the northern end of the Park and moved westwards and then sputhwards and eastwards. The Park was repeatedly walked up to 23.20 hours giving and overall study window of over 1.5 hours. Sunset was at 20.58 hours.

The survey resumed one hour before sunrise (which was at 06.04 hours) and continued on beyond sunrise to determine if there were roosts within or adjacent to the Park.

The Bat Conservation Ireland data for the area and the surveyor's own records were checked for any records of bats that may enter the site or may be distributed throughout the area.

Results

Species of bat resident in Porterstown Park on 13th August 2018
None

There is a Leisler's bat roost in close proximity to the western Park edge and a Leisler's bat mating perch in a beech tree across Rugged Lane from the western edge of the Park close to the garden and house. This was availed of by a male Leisler's bat.

Species of bat roosting in close proximity to the Park
Leisler's bat *Nyctalus leisleri*

There was a roost of this species to the southwest of the Park towards the River Liffey. Individuals of this species were seen very late into the morning feeding and finally flying in a southwestern direction. The final destination was not discerned.
In addition to this, a Leisler's bat mating perch was noted in a tree along Rugged Lane directly across the road from the Park perimeter. This species was also very notable feeding on the western section of the Park after sunset and again in this area prior to dawn.

Species of bat widespread in the Park
Leisler's bat ***Nyctalus leisleri***

This was the most widespread species within the Park and was present in almost all areas. Porterstown Park would appear to be a popular site for this species. This may be due to the open fields, large trees and River Liffey all within the area.

Soprano pipistrelle ***Pipistrellus pygmaeus***
This was a marginally more common type of pipistrelle. The unmanaged field where the Cricket Oval will be was more frequented by this species.

Common pipistrelle ***Pipistrellus pipistrellus***
This species was more notable at the playing fields but in particular where two hedges met on the eastern edge of the Park.

Nathusius' pipistrelle ***Pipistrellus nathusii***

There was one Nathusius; pipistrelle signal recorded on the SM2 monitor at the proposed Cricket Oval at approximately 02.20 hours. There was one possible Nathusius' pipistrelle at the athletics club area. This bat was flying away from the detector and this may be a Doppler effect lowering the frequency of a common pipistrelle. The species may be in the vicinity as it is known from Phoenix Park.

Daubenton's bat ***Myotis daubentonii***

Daubenton's bat signals were recorded by a static monitor within the proposed cricket oval area on four occasions during the night. This bat has a high affinity for water courses and may feed predominantly along the River Liffey. No bats were encountered during the active survey and this species typically avoids bright areas while some individuals adapt to bright areas on rivers.

Other species noted in the Area up to Spetmber 2018

Natterer's bat ***Myotis nattereri*** Luttrellstown, Phoenix Park

Whiskered bat ***Myotis mystacinus*** Luttrellstown, Clonsilla, Blanchardstown, Phoenix Park

Brown long-eared bat ***Plecotus auritus*** Luttrellstown, Castleknock College, Phoenix Park

Potential Impacts of Lighting Upon Bats

Lighting has the potential to affect bats in several ways including abandonment of roost sites, avoidance of areas previously used as feeding sites or commuting routes or increasing the likelihood of predation by birds such as sparrowhawks and owls or even from gulls or crow species or abandonment of drinking sites.

Loss of roosts may have a long-term impact on bats where alternative roosts are limited.

Lighting will most probably have its greatest impact when sunset is earlier, and lighting would be present for the two hours following sunset (or several minutes before it) when bats are most active. In winter, bat activity in Porterstown and along the River Liffey is likely to be very low with occasional flights to feed, drink or move roosts. Bats are occasionally reported in winter even during daylight hours, but it is very uncommon that they are observed.

Ultrasonic monitoring provides greater evidence of bat activity than previously believed even when temperatures are very low. Drinking is considered a significant purpose for emergence in winter.

General Recommendations

There are several sources of recommendations that are available for consideration for lighting with respect to bat conservation produced by Bat Conservation Ireland and the Bat Conservation Trust.

Bat Conservation Ireland have issued general principles regarding providing lighting with limited impact on the foraging and commuting of bats as these are the two elements likely to be affected by introducing greater levels of lighting in particular floodlighting to Porterstown Park. These are given below:

Table 1: General principles to reduce the impact of lighting on bats

Bat Conservation Ireland guidelines

Bat Conservation Trust Guidelines pertinent to floodlighting

Type of lamp (light source)

The impact on bats can be minimised using low pressure sodium lamps or high-pressure sodium instead of mercury or metal halide lamps where glass glazing is preferred due to its UV filtration characteristics.

Luminaire and light spill accessories

Lighting should be directed to where it is needed, and light spillage avoided. This can 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.

Predicting where the light cone and light spill will occur

There are lighting design computer programs that are widely in use which produce an image of the site in question, showing how the area will be affected by light spill when all the factors of the lighting components listed above are taken into consideration. This should be a useful tool to inform the mitigation process

Light levels

The light should be as low as guidelines permit. If lighting is not needed, don't light. Timing of lighting. The times during which the lighting is on should be limited to provide some dark periods. Roads or trackways in areas important for foraging bats should contain stretches left unlit to avoid isolation of bat colonies. These unlit stretches should be 10 metres in length either side of commuting route.

Timers

If the light is fitted with a timer this should be adjusted to the minimum to reduce the amount of 'lit time'.

Aim of light

The light should be aimed to illuminate only the immediate area required by using as sharp a downward angle as possible. This lit area must avoid being directed at, or close to, any bats' roost access points or flight paths from the roost.

A shield or hood can be used to control or restrict the area to be lit. Avoid illuminating at a wider angle as this will be more disturbing to foraging and commuting bats as well as people and other wildlife.

Specific Recommendations for Lighting at Porterstown Park

- **Lighting must be designed to prevent light overspill on to surrounding trees**

Light modelling would provide appropriate information on the means by which light will be restricted from the trees while providing illumination for sport. Internal louvres are the most efficient means of controlling light overspill / pollution.

- **LED lights as the option for the lighting**

LED lights are an energy efficient and highly controllable light source, are highly adaptable in terms of direction and strength and can be timed to switch on and off as they light quickly to the level required. These should ensure energy efficiency and money-saving as well as ecological advantages.

- **3 lux limit on treeline**

The light levels at the surrounding hedgerow shall be no greater than 3 lux as a baseline. Lighting can be provided that would allow for approximately 150 lux on the playing pitches.

- **Provision of alternative roosts**

  Bat boxes

8 x 2F Schwegler Bat Boxes, 4 with Double Front Panel, 4 with Standard Front Panel. These boxes shall be erected on suitable trees away from the cricket and football pitches that will be outside of the influence of the light cast from the sports floodlights. Boxes shall be in a southerly direction (6 of the 8, with 2 boxes in a westerly direction).

Bat boxes shall be installed to a maximum of 3 to any one tree and should not be installed where ivy is likely to grow into them, where disturbance will be high, in dense scrub or near a road. Boxes shall be no less than 3 metres above ground height.

Impacts After Mitigation

There will be a provision of alternative roost sites to compensate for any possible roost abandonment. It is intended that lighting will not be an issue at canopy height but there is a possibility that unidentified roosts may be abandoned and that boxes will create alternative roost sites specifically located away from lighting. There is no likelihood of loss of favourable conservation status for any of the species concerned within this area.

Conclusion

Much of the bat activity at Porterstown Park was of Leisler's bats, a relatively light-tolerant species, followed by soprano pipistrelle, then common pipistrelle; a less light tolerant group and finally Daubenton's bat; a primarily light-intolerant bat. Nathusius' pipistrelle was noted on one occasion. However, there is potential that less light tolerant bats such as Natterer's bat and whiskered bat and brown long-eared bat, all of whom, are known from the vicinity may enter the site occasionally or seasonally.

The lighting measures that have been proposed should allow for sufficient light for sports activities while not creating excessive light and interference with bats and other wildlife.

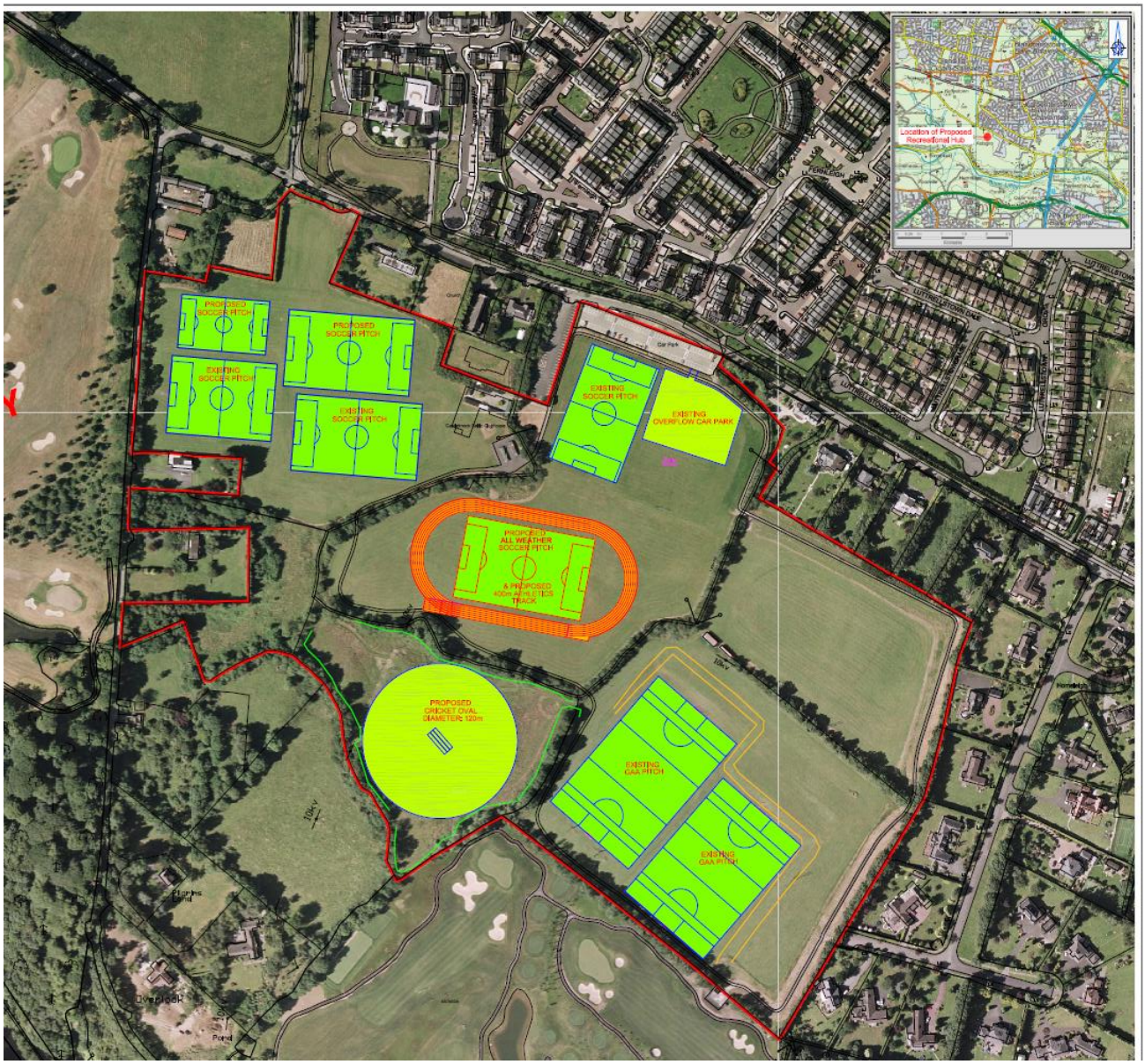


Figure 1: Porterstown Park – Pitches and lighting proposed to expand sports amenities

Figure 2: Transect walked at Porterstown Park from sunset up to 22.30 hours on 13th August 2018

Figure 3: Porterstown Park Leisler's bat activity

Yellow circle	Mating perch (outside park)		
Yellow arrow	Returning Leisler's bats prior to dawn	Yellow paddles	Points at which Leisler's bat was recorded

Figure 4: Common pipistrelle activity

Note star denotes "possible Nathusius' pipistrelle" at 22.07 hours

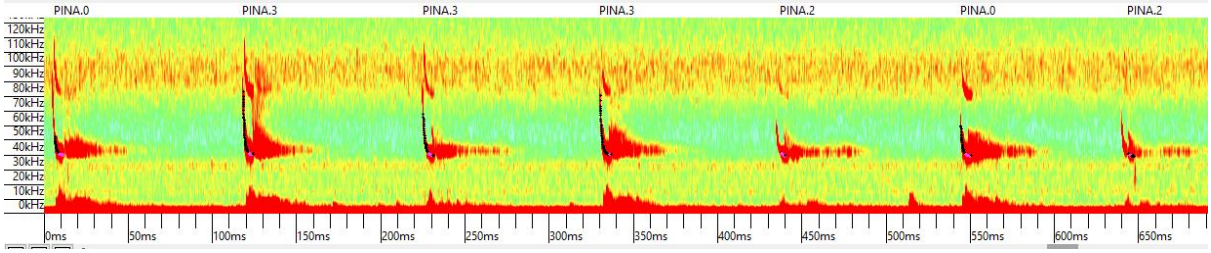


Figure 5: 22.07 hours "Possible Nathusius' pipistrelle " is possibly simply a common pipistrelle with a low slow signal. This species is known to be present in Áras an Uachtaráin and it is not impossible that is present in this area.

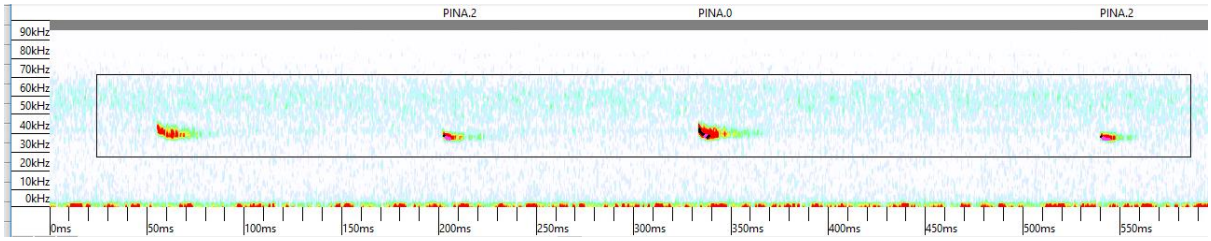
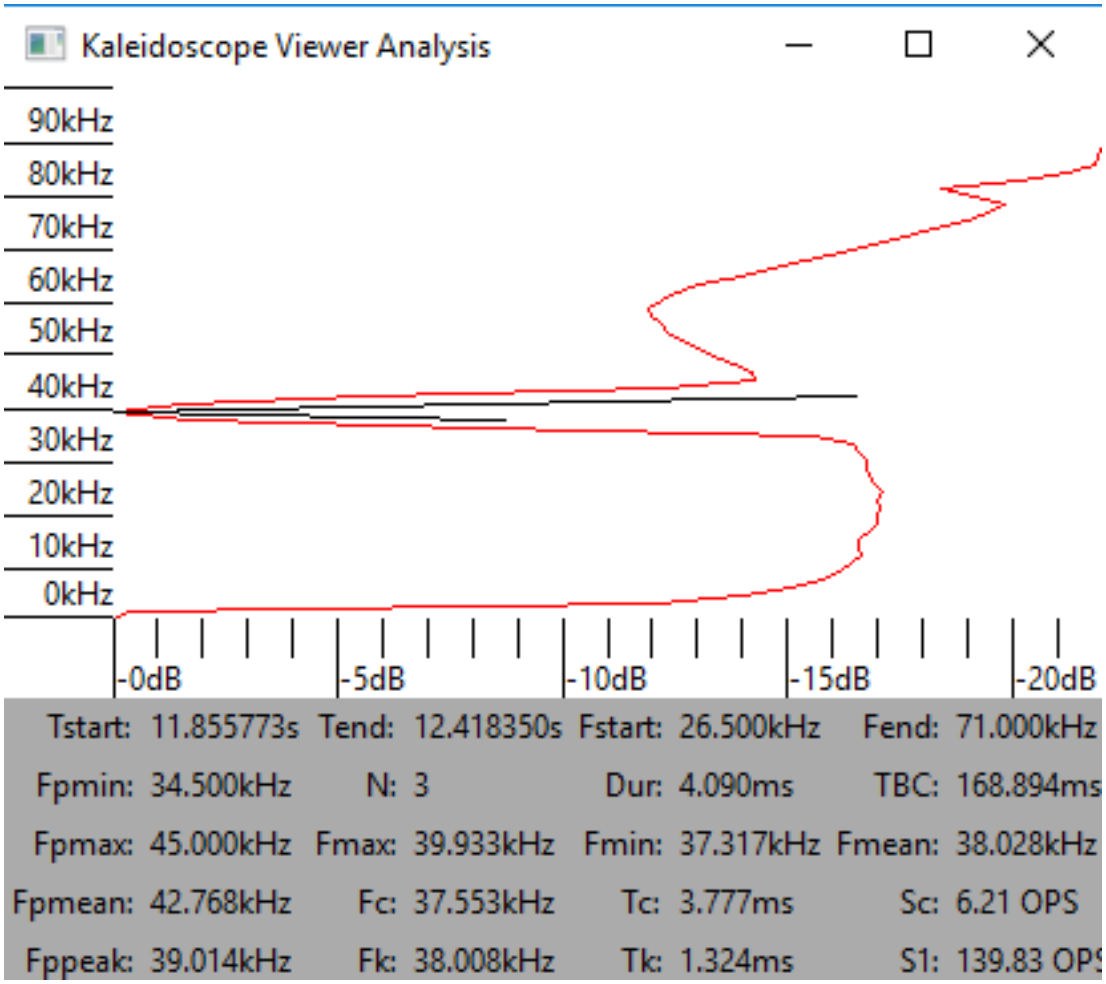


Figure 6: Nathusius' pipistrelle at the Cricket Oval site at c. 02.20 hours

(above spectrogram, below: power spectrum)



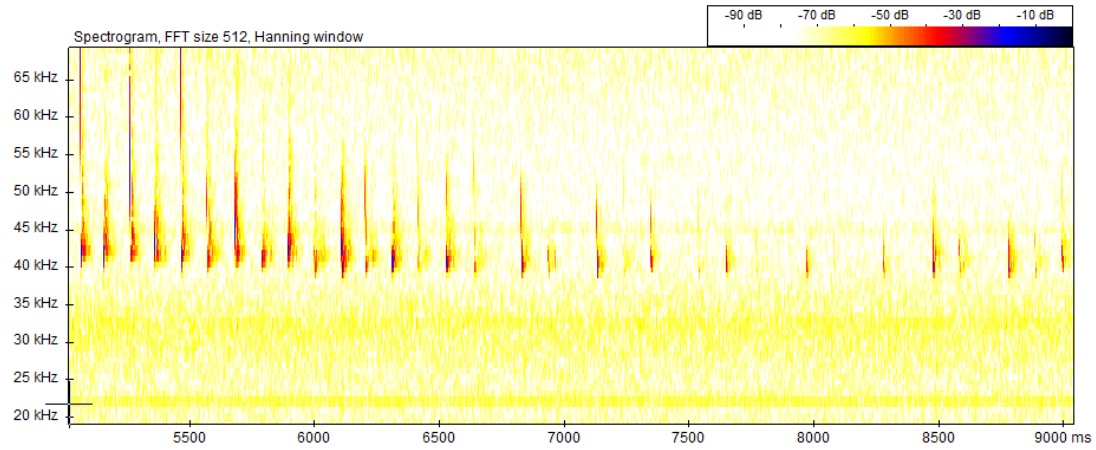


Figure 7: Two signals matched together for comparison: the signal to the left is more frequent and has a peak frequency of 42 kHz while the signal to the right (the pipistrelle at 22.07 hours) is slower and with a frequency of 40.2 kHz.

Figure 8: Soprano pipistrelle activity

Figure 9: Nathusius' pipistrelle record from SM2Bat+ on 13th – 14th August 2018
Signals on the SM2 alsoinclude Leisler's bat, common and soprano pipistrelle

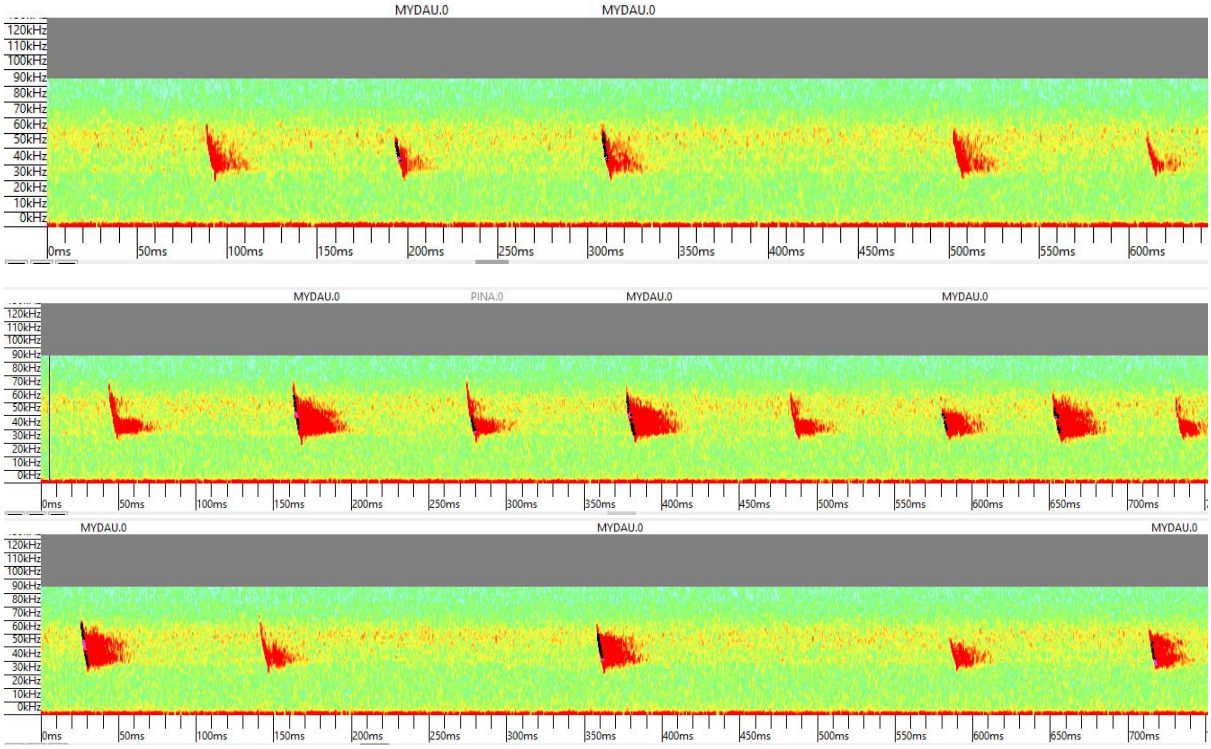


Figure 10: Daubenton's bat signals from proposed Cricket Oval area

Table 2: Bat signals recorded at Porterstown Park on hand-held EM3 after sunset

DATE	TIME	AUTO ID	PULSES	MATCH	MANUAL ID
13/08/2018	20:59:44	LEISLER'S BAT	14	14	LEISLER'S BAT
13/08/2018	21:00:17	LEISLER'S BAT	22	22	LEISLER'S BAT
13/08/2018	21:01:57	NoID	2	0	LEISLER'S BAT
13/08/2018	21:02:30	LEISLER'S BAT	54	54	LEISLER'S BAT
13/08/2018	21:03:03	LEISLER'S BAT	25	25	LEISLER'S BAT
13/08/2018	21:08:03	LEISLER'S BAT	4	4	LEISLER'S BAT
13/08/2018	21:11:23	LEISLER'S BAT	4	4	LEISLER'S BAT
13/08/2018	21:12:30	COMMON PIPISTRELLE	12	12	COMMON PIPISTRELLE
13/08/2018	21:13:36	LEISLER'S BAT	34	34	LEISLER'S BAT
13/08/2018	21:14:10	LEISLER'S BAT	16	16	LEISLER'S BAT
13/08/2018	21:14:43	SOPRANO PIPISTRELLE	19	18	LEISLER'S BAT SOPRANO PIPISTRELLE
13/08/2018	21:15:50	LEISLER'S BAT	19	19	LEISLER'S BAT
13/08/2018	21:16:20	LEISLER'S BAT	5	5	LEISLER'S BAT
13/08/2018	21:16:23	LEISLER'S BAT	9	9	LEISLER'S BAT
13/08/2018	21:17:29	LEISLER'S BAT	18	18	LEISLER'S BAT
13/08/2018	21:17:59	LEISLER'S BAT	3	3	LEISLER'S BAT
13/08/2018	21:19:10	LEISLER'S BAT	5	5	LEISLER'S BAT
13/08/2018	21:20:16	COMMON PIPISTRELLE	29	21	LEISLER'S BAT COMMON PIPISTRELLE SOPRANO PIPISTRELLE
13/08/2018	21:20:49	COMMON PIPISTRELLE	30	26	LEISLER'S BAT COMMON PIPISTRELLE
13/08/2018	21:21:19	COMMON PIPISTRELLE	15	13	LEISLER'S BAT COMMON PIPISTRELLE
13/08/2018	21:21:23	COMMON PIPISTRELLE	26	11	LEISLER'S BAT COMMON PIPISTRELLE
13/08/2018	21:23:03	SOPRANO PIPISTRELLE	49	38	LEISLER'S BAT SOPRANO PIPISTRELLE
13/08/2018	21:24:09	LEISLER'S BAT	3	3	LEISLER'S BAT
13/08/2018	21:24:39	LEISLER'S BAT	2	2	LEISLER'S BAT
13/08/2018	21:25:16	LEISLER'S BAT	2	2	LEISLER'S BAT
13/08/2018	21:26:56	LEISLER'S BAT	9	9	LEISLER'S BAT
13/08/2018	21:27:26	LEISLER'S BAT	7	7	LEISLER'S BAT
13/08/2018	21:27:29	LEISLER'S BAT	11	10	LEISLER'S BAT
13/08/2018	21:35:16	LEISLER'S BAT	68	63	LEISLER'S BAT
13/08/2018	21:35:46	LEISLER'S BAT	3	3	LEISLER'S BAT
13/08/2018	21:47:29	SOPRANO PIPISTRELLE	22	19	LEISLER'S BAT SOPRANO PIPISTRELLE
13/08/2018	21:47:59	SOPRANO PIPISTRELLE	18	18	SOPRANO PIPISTRELLE
13/08/2018	21:48:02	SOPRANO PIPISTRELLE	64	40	LEISLER'S BAT SOPRANO PIPISTRELLE
13/08/2018	21:51:22	SOPRANO PIPISTRELLE	9	9	SOPRANO PIPISTRELLE
13/08/2018	21:53:36	SOPRANO PIPISTRELLE	31	31	SOPRANO PIPISTRELLE
13/08/2018	21:54:06	SOPRANO PIPISTRELLE	2	2	SOPRANO PIPISTRELLE
13/08/2018	21:54:09	SOPRANO PIPISTRELLE	26	26	SOPRANO PIPISTRELLE
13/08/2018	21:54:39	SOPRANO PIPISTRELLE	2	2	SOPRANO PIPISTRELLE
13/08/2018	21:59:09	COMMON PIPISTRELLE	34	33	COMMON PIPISTRELLE
13/08/2018	22:06:56	NATHUSIUS' PIPISTRELLE	33	30	COMMON PIPISTRELLE
13/08/2018	22:21:23	SOPRANO PIPISTRELLE	66	57	SOPRANO PIPISTRELLE
13/08/2018	22:21:53	LEISLER'S BAT	2	2	LEISLER'S BAT
13/08/2018	22:25:16	COMMON PIPISTRELLE	4	4	COMMON PIPISTRELLE

Table 3: Bat Conservation Ireland data: search results 11 Sep 2018

Search parameters: Roosts Transects Ad-hoc observation sites with observations of all bats within 1000m of O0629236633.			
Ad-hoc observations			
Survey	Grid reference	Date	Species
BATLAS 2010	O063359	30/06/2008	Myotis daubentonii; Myotis spp.; Nyctalus leisleri; Pipistrellus pipistrellus ; Pipistrellus pygmaeus
BATLAS 2010	O0537	15/08/2008	Myotis daubentonii; Nyctalus leisleri; Pipistrellus pipistrellus. Pipistrellus pygmaeus
BATLAS 2010	O062366	25/09/2008	Pipistrellus pipistrellus (45kHz); Pipistrellus pygmaeus
BATLAS 2010	O0637	15/08/2008	Myotis daubentonii; Nyctalus leisleri; Pipistrellus pipistrellus; Pipistrellus pygmaeus
EIS surveys - Brian Keeley	O0550036800	09/09/2005	Myotis daubentonii; Myotis nattereri; Nyctalus leisleri; Pipistrellus pipistrellus; Pipistrellus pygmaeus; Plecotus auritus

Plate 1: Porterstown Park with the clubhouse visible in the final image

Plate 2: Lighting along the access path to the Park

This lighting switches off after less than an hour after sunset and creates darkness along the hedge