Appendix 5.2
Ecological Survey for Bats

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ECOLOGICAL SURVEY FOR BATS

HERBATA DATA CENTRE

NI 2615 - Ecology
Ecological Survey for Bats
F01
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1 INTRODUCTION

1.1 Introduction

RPS was commissioned by Herbata Ltd to undertake an Ecological Survey for Bats to inform an Environmental Impact Assessment Report (EIAR) for the proposed Herbata Data Centre, Jigginstown, Naas, County Dublin. A full description of the proposed development can be found in Chapter 4 Project Description of the accompanying EIAR.

1.2 Ecological Survey for Bats

The aim of the report is to provide a description of the bat survey methods used; to provide the detailed results of bat surveys; and to provide an interpretation of the results. The Ecological Survey for Bats is used to inform the Biodiversity Chapter of the EIAR, which identifies the impacts associated with the proposed development, evaluates the likely significance of effects on bats and applies the mitigation hierarchy to avoid, reduce or offset any significant negative effects on bats.

1.3 Legislation

All species of bats are European Protected Species (EPS) listed on Annex IV of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora ("the Habitats Directive"), the lesser horseshoe bat, are also listed on Annex II. The domestic legislation, the European Communities (Birds and Natural Habitats) Regulations 2011, (S.I. No. 477 of 2011) ("the Habitats Regulations"), which implements this Directive, combined with the Wildlife Acts 1976 to 2021, ensures that individual bats and their breeding sites and resting places are fully protected (Marnell et al. 2022).

1.4 Proposed Development

The proposed development would involve the construction of a large data centre on the site inclusive of the requirement for significant habitat clearance, and the delivery of significant areas of compensatory planting, SUDs features and other required infrastructure.

The location of the proposed development and the planning application boundary are illustrated in Figure 5.1 Site Location of the EIAR (see Volume III: Figures).

2 METHODOLOGY

2.1 Statement of Authority

The lead bat surveyor and author, Samuel O'Hara, is an Associate Ecologist with RPS and holds a BSc (Hons) in Ecology and has over eight years of experience in the field of ecology consultancy. Samuel has specialist training in bat survey, sound analysis and species identification, mitigation and compensation, and Lantra Tree Climbing and Arial Rescue. He holds a Natural England Class 1 Licence to survey known bat roosts (No. C191799). Samuel is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

The assistant bat surveyor, Dave Welsh, is a Principal Ecologist with RPS and holds a BSc (Hons) in Marine Science, a MSc in Ecological Management and Conservation Biology with over seven years of experience in conservation and over eight years of experience in ecological consultancy. Dave has in-house training in bat ecology and bat survey and specialist training in sound analysis and species identification, mitigation and compensation; Bat Tree Habitat Key Tree-roost and Woodland Bat Survey; and Lantra Tree Climbing and Arial Rescue. Dave is a protected species licence holder, a former member of the Northern Ireland Bat Group (NIBG) and a former volunteer bat rescuer with bat handling experience. Dave is an associate member of the CIEEM.

The reviewer, Suzanne Lowry, is a Senior Associate of Ecology within RPS and holds a BSc (Hons) in Biological Sciences, a MSc in Environmental Management and has over 19 years of experience in the field of ecology and environmental consultancy. Suzanne is an experienced bat surveyor with specialist training in bat ecology, bat survey, sound analysis and species identification, mitigation and compensation. She is also responsible for in-house bat training. Suzanne is a protected species license holder and a former member and committee member of the Northern Ireland Bat Group (NIBG). Suzanne is an associate member of the CIEEM.

The information prepared and provided is true and accurate at the time of issue of this report and has been prepared and provided in accordance with the CIEEM Code of Professional Conduct (CIEEM 2019). We confirm that the professional judgement expressed herein is the true and bona fide opinion of our professional ecologists.

2.2 Preliminary Ecological Appraisal for Bats

A Preliminary Ecological Appraisal for Bats (PEAB) comprising of a desk study and site walkover has been completed for the proposed development.

Information from the National Biodiversity Data Centre (NBDC) was downloaded from Biodiversity Maps in October 2022. A species list of historical records was generated from a customised polygon within 1 km^2 of the site of the proposed development. The information gathered during the desk study is third party controlled data. RPS cannot guarantee its accuracy and cannot be held liable for any inaccuracies.

The aim of the site walkover was to observe, assess and record the potential suitability of the site of the proposed development to support bat roosting habitat, commuting habitat and/or foraging habitat. Habitat features were classified as negligible, low, moderate or high in accordance with Bat Conservation Trust (BCT) Good Practice Guidelines (Collins 2016).

2.3 Preliminary Roost Assessment of Structures

A Preliminary Roost Assessment (PRA) of structures within the site was carried out during daylight hours in October 2022 in accordance with Collins (2016). An external inspection survey of structures was undertaken from ground level to look for potential and actual bat entry/exit points, evidence of bat roosts and signs of bat related activity in order to determine the presence of bats or likely presence of bats.

2.4 Preliminary Roost Assessment of Trees

A Preliminary Roost Assessment (PRA) of trees was carried out during daylight hours in October 2022. A detailed external inspection of trees was undertaken from ground level to identify Potential Roost Features (PRFs) that could be used by roosting bats. Bats rely on the presence of disease and decay; damage; and associations in trees to provide suitable roosting habitat. These three forms of PRF result in the development of a variety of different features that can provide preferred roost sites for bat species (Andrews 2018 and Collins 2016).

- Disease and decay PRFs include woodpecker holes, squirrel holes, knot holes, pruning cuts, tear outs, wounds, cankers, compression forks and butt rots.
- Damage PRFs include lighting strikes, hazard beams, subsidence cracks, shearing cracks, transverse snaps, welds, lifting bark, desiccation fissures and frost cracks.
- Association PRFs include fluting and ivy with stem diameters in excess of 50 mm.

Trees were classified as having negligible, low, moderate or high suitability for roosting bats in accordance with the Bat Conservation Trust, Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition) (Collins 2016). The aim of the PRA is to determine if further Tree Climbing PRF Inspection Surveys are required.

2.5 Tree Climbing PRF Inspection Survey

A Tree Climbing PRF Inspection Survey was carried out by two suitability qualified bat surveyors using tree-climbing equipment, ladders, a torch and endoscope in May and July 2023. The aim of the survey was to allow closer inspection of PRFs identified during the ground level PRA of trees. The survey aims to look for evidence of bats including live or dead bats, droppings, staining, odour and/or other physical characteristics and where necessary to reclassify PRFs in accordance with Collins (2016). Survey results were compared with information and records from the *Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-Care and Ecology Professionals* (Andrews 2018) to aid in the classification and identification of PRFs.

2.6 Emergence/Re-Entry Surveys of Structures

Emergence/re-entry surveys of structures and trees were carried out to watch, listen and records bats exiting or entering potential roosts. The surveys were carried out by two surveyors between June and August 2023. The surveys were carried out when weather conditions were forecast to consist of temperatures >10 °C with little or no wind or precipitation. The dates, times & meteorological conditions of emergence/re-entry surveys of structures can be found below in Table 2.6.1.

Table 2.6.1: Dates, Times & Metrological Conditions of Emergence/Re-Entry Survey							
Date	Structure Ref.	Sunset	Sunrise	Start Time	Finish Time	Temperature	Weather Conditions
12/06/23	S3 & S4	21:53	-	21:42	23:52	20-18°C	Light breeze, patchy cloud, dry
13/06/23	S1, S5 & S6	21:54	-	21:35	23:45	17-13°C	Calm, clear skies, dry
29/06.23	S3 & S4	21:57	-	21.55	23. 43	15-14°C	Calm, clear skies, dry
03/08/23	S2, T8, & T15	21.18	-	20.58	23.18	14-16°C	Light breeze, patchy cloud, dry
04/08/23	S1, S5 & S6	-	05.48	03.35	06.03	12-13°C	Light breeze, patchy cloud, occasional light rainfall

Night Vision Aids (NVAs) including Canon XA11 Compact Full HD Camcorders aided by two Nightfox XB5 850NM Infrared LED Flashlights per camcorder were used to record bats. Elekon Batlogger M bat detectors with real time full spectrum recording, an integrated Global Positioning System (GPS) and temperature logger were paired with each camcorder and used to record bat echolocation calls. A Pulsar Axion XM30S handheld thermal imaging monocular was also used by the bat surveyor as a complementary survey aid to provide additional data to the video and acoustic data. The NVA equipment was deployed and monitored by two surveyors during the course of the survey.

2.7 Bat Activity Surveys

Bat Activity Surveys were carried out to determine the assemblage of bat species within the site; the nature of bat behaviour; and the spatial distribution of bat activity within the site. Walked transects were surveyed to record and determine the level of bat activity within the site of the proposed development. The location of transects was determined by site access, health and safety considerations and suitable habitat features for bats. The surveys were carried out when weather conditions were forecast to consist of sunset temperatures of 10 °C or above with little or no wind or precipitation. The dates, times & meteorological conditions of bat surveys can be found below in Table 2.7.1

Table 2.7.1: Dates, Times & Metrological Conditions of Bat Activity Surveys						
Date	Sunset	Sunrise	Start Time	Finish Time	Temperature	Weather Conditions
16/05/23	21:20	-	21.29	22.59	16-13°C	Calm, patchy cloud, dry
12/06//23	21:53	-	21.42	23.41	20-18°C	Light breeze, patchy cloud, dry
29/06/23	21:57	-	21.55	23. 43	15-14°C	Calm, clear skies, dry
03/08/23	21.18	-	21.13	23.10	14-16°C	Light breeze, patchy cloud, dry

Elekon Batlogger M bat detectors with real time full spectrum recording, an integrated Global Positioning System (GPS) and temperature logger were used to record bat echolocation calls for later sound analysis using Bat Explorer Software. The number of bats, bat species, bat behaviour and the direction of flight of each bat was also recorded where possible.

In order to undertake analysis of data collected during bat activity surveys, bat echolocation calls were transformed into a Bat Activity Index (BAI) providing an indicator of the overall bat activity at the site. The BAI is expressed as the number of bat passes per unit of time. A single bat pass is defined as 'one ten second recording file which contains at least one bat call'. The BAI standardizes the relative bat activity despite variation in the length of recording each night, bat behaviour or individual bat abundance. The BAI therefore enables determination of temporal, spatial and species-specific patterns of bat activity within the site. It is not possible however to accurately determine the number of individual bats recorded in order to estimate the abundance of bats as it is difficult to distinguish between multiple passes of a single bat and single passes of multiple bats.

3 RESULTS

3.1 Preliminary Ecological Appraisal for Bats

Information from the NBDC downloaded from Biodiversity Maps in October 2022 identified a total of 41 No. bat records of the following species within approximately 1 km of the site of the proposed development; Dabenton's bat *Myotis* daubentoniid (29 No.); common pipistrelle *Pipistrellus pipistrellus* (5 No.)*;* soprano pipistrelle *Pipistrellus pygmaeus* (2 No.); Leisler's bat *Nyctalus leisleri* (3 No.); Natterer's bat *Myotis nattereri* (1 No.) and brown long-eared bat *Plecotus auristus* (1 No.).

The potential suitability of the site to provide habitat for foraging and commuting bats is considered moderate. The site itself consists of agricultural grassland with interconnecting hedgerows which could be used by commuting and foraging bats. Foraging opportunities within 250 m consist of similar agricultural landscape in addition to areas unfavourable for foraging including the M7 Road, and various industrial and commercial premises. Potential foraging opportunities in the wider area include the River Liffey approx. 0.7km to the west and the Grand Canal 0.7km to the southeast on the other side of the M7 motorway. These habitats provide suitable commuting routes linking the site to the wider landscape together with suitable foraging habitat for bats.

3.2 Preliminary Roost Assessment of Trees

Trees within the site were subject to ground level PRA to identify PRFs that could provide roosting habitat for bats. There was a total of 20 trees with PRFs identified that could provide suitable habitat for bats. A total of 19 trees were classified as having Moderate suitability and a single tree was classified as having Low suitability; The remaining trees onsite considered to have Negligible suitability to provide roosting habitat for bats. Full details of the PRA can be found in **Appendix I**. The location of the trees can be found in **Figure 1.0: Trees and Structures with Roosting Bat Potential**.

3.3 Tree Climbing PRF Inspection Survey

The 19 trees identified during the PRA identified as having moderate suitability to provide roosting habitat for bats were climbed using rope access techniques or ladders enabling a detailed search and inspection of PRFs using a torch and endoscope.

Following the tree climbing PRF inspection survey, a number of trees were downgraded or upgraded from Moderate bat roosting suitability:

- A total of six trees (T9, T10, T12, T14, T17, T18) were downgraded to Negligible bat roosting suitability due to a lack of cavity size and shelter.
- T7 & T13 were downgraded to Low bat roosting suitability due to a lack of cavity size and/or exposure.
- Two trees (T6 & T15) were upgraded to High bat roosting suitability due to them both supporting larger cavities with suitable characteristics to provide roosting habitat for a larger number of bats such as a maternity colony.
- The remaining 9 trees (T1-T5, T8, T11, T16, T19) remained as having Moderate bat roosting suitability.

No bats or evidence of roosting bats were recorded during the Tree Climbing PRF Inspection Survey.

The results of the Tree Climbing PRF Inspection Survey can be found in **Appendix I**.

3.4 Preliminary Roost Assessment of Structures

There are 13 structures on site that will be demolished in order to accommodate the proposed development.

A total of six of these structures have potential suitability to provide roosting habitat for bats. There were no signs of bat related activity recorded at any of these six structures during initial surveys. A map illustrating the location of structures surveyed during the PRA can be found in **Figure** 1.0 **Trees and Structures with Bat Roost Potential**. The PRA for each structure can be found in **Appendix I**. The six structures identified with potential suitability to provide roosting habitat for bats were subject to further Emergence/Re-entry Surveys as set out below in Section 3.5.

3.5 Emergence/Re-Entry Surveys of Structures and Trees

The PRA identified a total of six structures with potential suitability to provide roosting habitat for bats. These structures were subject to emergence/re-entry surveys in accordance with *BCT best practice Guidelines* (Collins, 2016) and *NPWS Bat mitigation guidelines for Ireland* (Marnell, F, et al. 2022).

Two trees (T8 & T15) were subject to emergence surveys. Tree T8 (mature aspen) was only partially surveyed during tree climbing PRF survey, given that a jackdaw nest was discovered. Given that this tree had potential to support moderate bat roosting suitability, a second survey was required. An emergence survey was chosen given the potential presence of nesting birds. T15 (mature crack willow) was considered to support high bat roosting suitability, and therefore in line with Collins (2016), it required a total of three surveys. It had previously been subjected to two climbing close inspection surveys; the third survey comprised an emergence survey.

Surveys identified the presence of one confirmed bat roosts on site (Structure 1). A map illustrating the location of structures and trees surveyed during the PRA can be found in **Figure 2.0: Buildings and Trees subject to Emergence/Re-entry Surveys**.

Table 3.5.1: Bat Emergence Surveys of Structures and Trees

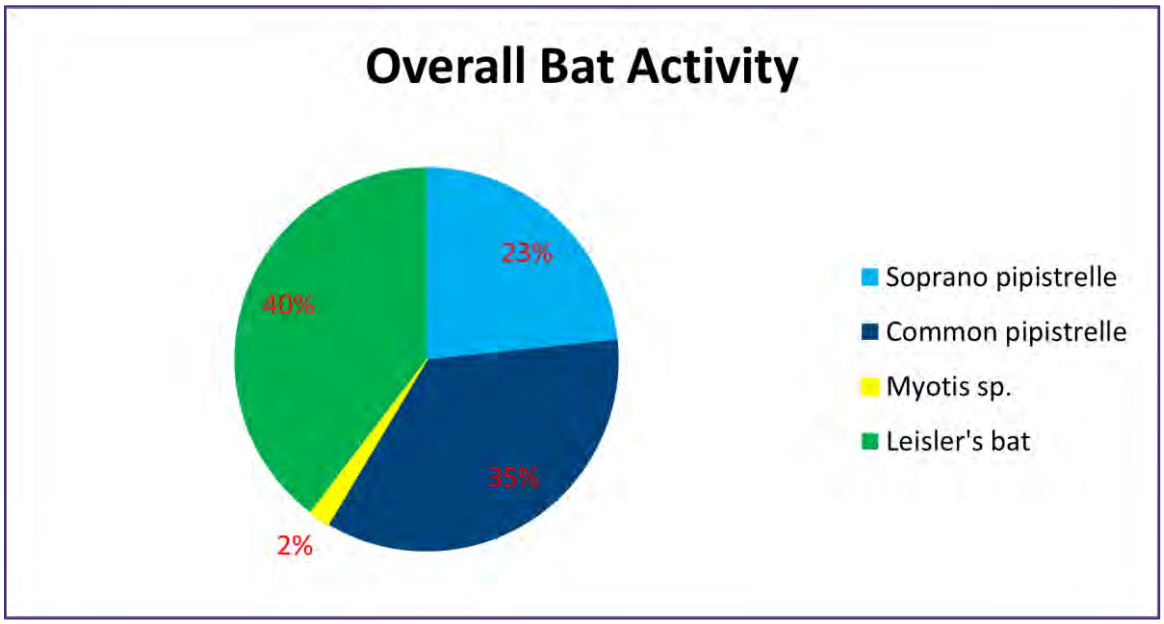
Structure No.	Bat Suitability	Date	Survey Type	Notes
S1 Former Garage/Store	Low/Moderate	13/06/23	Dusk	At 22.43 (approx. 55 minutes after sunset) a single *Myotis* sp., likely a Daubenton's bat was observed emerging from the structure (doorway), and then re-enters via a different doorway seconds later. It continues this behaviour several times before leaving the yard. This is a confirmed bat roost.
		04/08/23	Dawn	At 03.39 a single *Myotis* sp. bat, likely a Daubenton's bat was observed flying into structure via a large open garage type doorway to briefly forage in flight within the interior of the building, before leaving the room approx. 30 seconds later. The bat was observed to continue this behaviour regularly throughout the survey. Another *Myotis* sp. bat was observed to display the same foraging behaviour towards the latter part of the survey. At approx. 04.26, one of the bats leaves the yard. At 04.30, the remaining bat enters under an end roof slate (Plate 2). This is a confirmed bat roost.

S2 Former Stables	Low	03/08/23	Dusk	At 21.47 a single Common Pipistrelle Bat, was observed to fly through an open doorway and fly around inside for approx 50 seconds, likely foraging before leaving through an adjadcent doorway. At 22.46 a Myotis sp., likley a Daubenton's Bat displays similar foraging behaviour, leaving approx 2 minutes later. This is not a confirmed bat roost.
S3 Derelict House	Moderate	12/06/23	Dusk	No bats were observed emerging from or entering the structure.
		29/06/23	Dusk	No bats were observed emerging from or entering from the structure.
S4 Thatched/Tin Roof	Moderate	12/06/23	Dusk	A single Brown Long-eared bat silently entered a large ground level window/opening into room at 23.29 (approx. 1h 36 minutes after sunset). The bat then disappeared out of view for 12 seconds and was then observed briefly flying around inside the room, likley foraging before emerging and leaving the yard. This is not a confirmed bat roost.
		29/06/23	Dusk	No bats were observed emerging from or entering from the structure.
S5 Garage	Moderate	13/06/23	Dusk	No bats were observed emerging from or entering the structure.
		04/08/23	Dawn	No bats were observed emerging from or entering the structure.
S6 Unoccupied House	Moderate	13/06/23	Dusk	No bats were observed emerging from or entering the structure.
		04/08/23	Dawn	No bats were observed emerging from or entering the structure.
Tree T8 Mature Aspen	Moderate	03/08/23	Dusk	No bats were observed emerging from or entering the tree.
Tree T15 Mature Crack Willow	High	03/08/23	Dusk	No bats were observed emerging from or entering the tree.

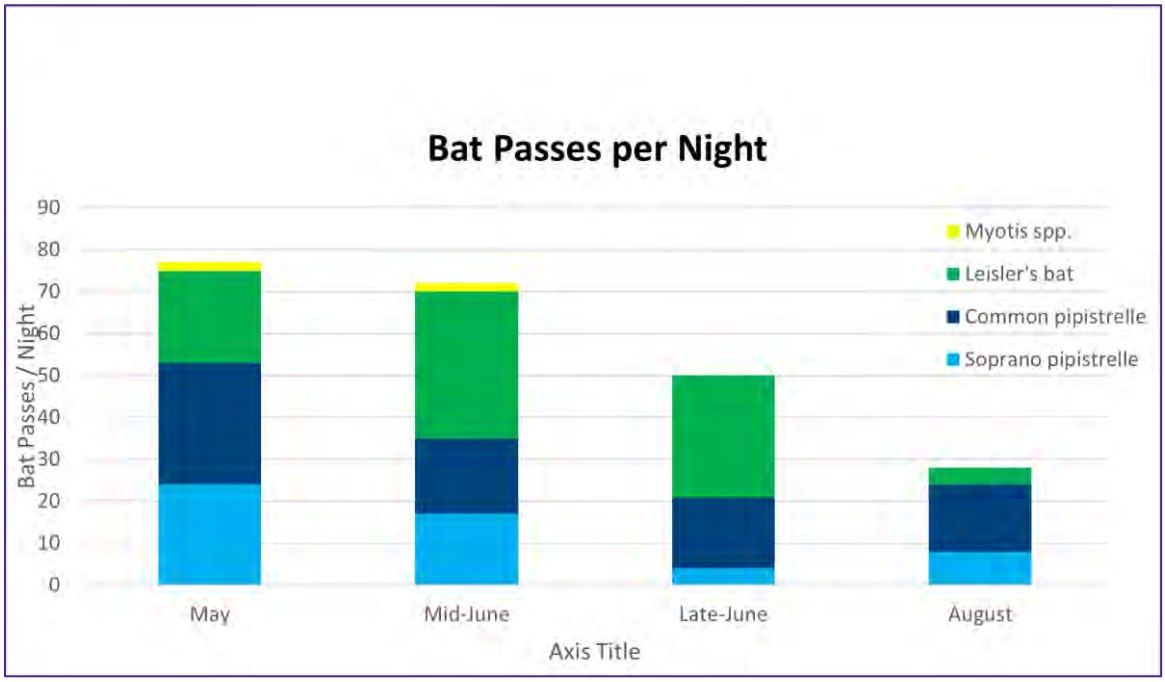
3.6 Bat Activity Surveys

Three bat species were identified to species level, these include: Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat. A total of 4 *Myotis* sp. calls were recorded during the course of bat activity surveys. These calls were not identified to species level as it is often difficult to accurately identify to species level, given that their call characteristics often overlap can be significantly similar in structure. Small numbers of *Myotis* sp. bats and numerous *Myotis sp.* bat calls were recorded within the farmyard during emergence and re-entry surveys. A single Brown Long-Eared Bat was recorded on one occasion during a dusk emergence survey (see Section 4 below).

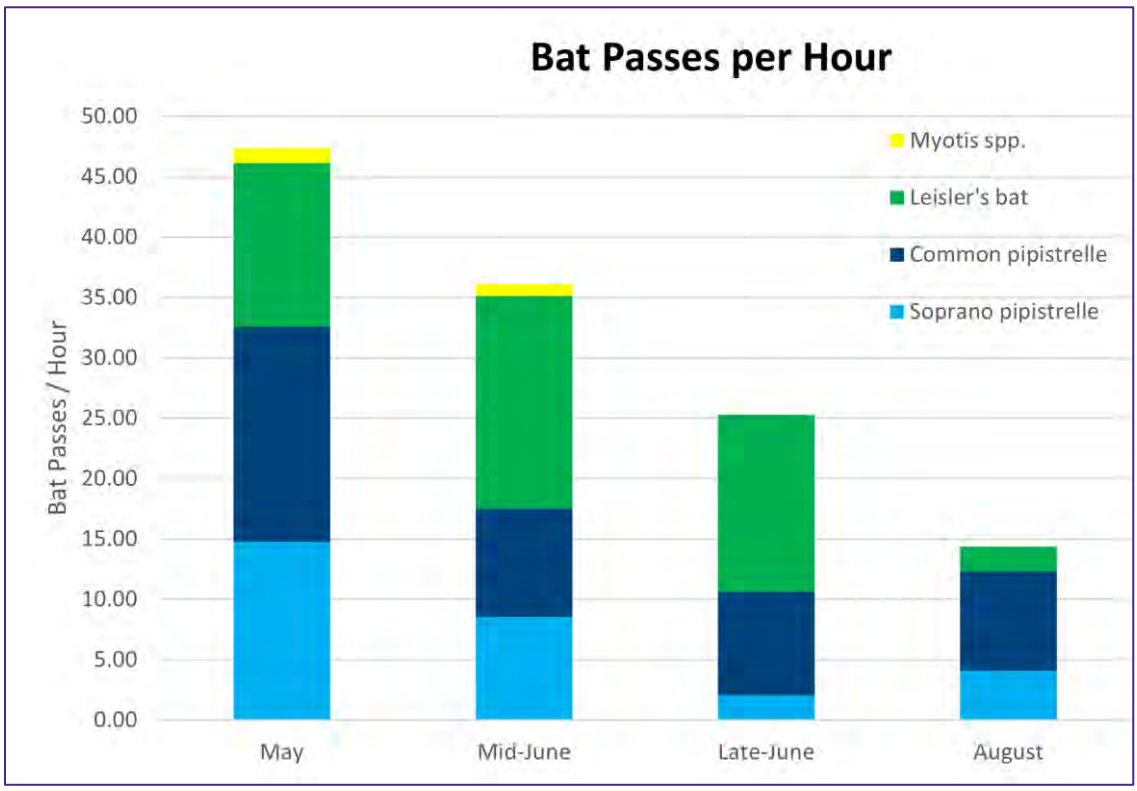
Bat activity levels on site are illustrated on Graphs 1 -3. Maps illustrating the spatial distribution of bat species recorded each survey can be found in **Figures 3.0 – 6.0 Bat Activity Surveys.**



Graph 1: Showing the overall bat activity recorded from May to August 2023.



Graph 2: Showing the total number of bat passes recorded per survey night.



Graph 3: Showing the total number of bat basses recorded per hour.

4 DISCUSSION & ANALYSIS OF RESULTS

Information obtained from the NBDC identified bat records of the following species Common Pipistrelle, Soprano Pipistrelle, Daubenton's Bat, Natterer's bat, Brown Long-eared Bat and Leisler's Bat. All but one of these species, Natterer's Bat, were confirmed on site during the course of bat surveys. *Myotis* sp. bat calls were recorded infrequently during the activity surveys, with only 4 calls over the course of the bat activity surveys. Due to the similarities and overlap between the characteristics of Irish *Myotis* sp. echolocation calls, it is often difficult to accurately identify *Myotis* sp. bats to species level using echolocation calls alone. *Myotis* sp. bats were recorded during a dusk emergence survey (see below) with calls which most closely resemble those of Daubenton's Bat. The Myotis sp. calls recorded infrequently during the bat activity surveys have not been identified to species level, and therefore, could potentially be both or either Natterer's Bat or Daubenton's Bats. However, even in the absence of historic records of Whiskered Bat *Myotis mystacinus*, the presence of this species cannot be excluded.

Leisler's bat contributed to the highest proportion of bat activity on site with 40% of overall bat calls recorded (see Graph 1). This species was observed foraging along tree tops and out in the open at height, however most activity was not visually observed due to the bat species fast flight and brief overhead passes at height.

Common Pipistrelle contributed to 35% of overall bat calls recorded, followed by Soprano Pipistrelle with 26% of overall calls recorded. Both species were observed foraging at a range of heights, often as low as 2m above ground along hedgerows. Type D antagonistic social calls were occasional heard on all survey nights. These calls are usually produced in flight and are thought to be related to territorial behaviour (Middleton, et al. 2014).

Only 2% of bat calls recorded during the four bat activity surveys came from *Myotis* sp. bats. This may be in part due to Myotis spp. typically emitting relatively quiet calls which can be difficult to record. This is likely also the case for Brown Long-eared bats on site.

Bat activity levels was highest during the first survey in May (See Graphs 2 & 3) and were found to decline on each consecutive survey visit. The level of bat activity recorded was lower than expected given the quality/size of vegetated field boundaries, with a relatively low number of individual bats seen during the early portion of each activity survey.

The removal of a significant proportion of linear features including hedgerows and treelines in addition to grazed grasslands will reduce foraging opportunities for the immediate local bat population. The site is bounded to the north and south by industrial developments, and the high traffic M7 Motorway to the east. It is highly likely that the local bat population utilise the vegetated linear features, namely hedgerows and treelines to the west, in the lands adjacent to the site as commuting corridors to River Liffey. Given that the site is located at the periphery of typically suboptimal habitats, namely industrial and commercial and a motorway, the loss of linear features within the site is considered unlikely to cause significant severance or fragmentation impacts of the wider landscape. Impacts to foraging and commuting bat populations are considered to be fairly localised.

A total of 19 trees were assessed to have Moderate bat roosting suitability during the ground level PRA with a further one assessed as low. Six of these trees were downgraded to Negligible bat roosting suitability due to the trees either having superficial cavities or cavities which lack sufficient size and shelter to support roosting bats, even for short term use. Two trees were downgraded to Low bat roosting suitability due to the presence of shallow cavities with inadequate shelter and limited roosting suitability. Two trees were upgraded to High bat roosting suitability due to the trees supporting cavities of sufficient size and

characteristics to potentially support a larger number of bats such as a maternity colony. Nine trees remained as having moderate bat roosting suitability. No bats or evidence of bat roosting was recorded during the two Tree Climbing PRF Inspection Surveys and dusk emergence survey (Trees T8 & T15). The other tree identified to support high bat roost potential (T6) which was not subject to emergence survey, is to be retained within the proposed development.

Surveying trees for bat roosts can be more challenging than surveying buildings because many species that use trees for roosts are known to frequently exhibit roost switching behaviour (Andrews, H, 2008, Harris and Yalden, 2008, Dietz et al., 2011), and therefore the probability of finding an occupied bat roost is low. It is possible that any of the trees located within the Application Site Boundary which have been confirmed to have bat roosting suitability could be used for roosting purposes at other times throughout the year. For this reason, they must be considered as a potential roosting resource. Section 5 outlines PRF mitigation and proposed compensation measures.

A total of two confirmed bat roosting sites were recorded within the Application Site Boundary, both of which are located in Structure 1. On the 13th of June 2023, at 22.43 (approx. 55 minutes after sunset), a single *Myotis* sp. bat, likely a Daubenton's bat was observed emerging from the structure (open doorway), it then re-entered via a different doorway seconds later. It continued this behaviour several times before leaving the yard. The echolocation calls most closely resembles a Daubenton's bat *Myotis Daubentonii*, however due to the similarities in call structure and frequency ranges between the three *Myotis* sp. present in Ireland, it is often difficult to identify to species level using echolocation calls alone. However, given that there are total of 29 records of Daubenton's Bat (2013) within approximately 1 km of the Application Site Boundary, and that the roost on site (Structure 1) is linked to the River Liffey (0.7km) and partially connected to the Grand Canal via linear hedgerows and tree lines (habitat linkage to Grand Canal is dissected by M7 motorway), approx. 0.7km away, it increases the likelihood the bat roosting on site is a Daubenton's Bat.

On the 4th of August at 03.39 a single *Myotis* sp. bat, likely a Daubenton's bat was observed flying into Structure 1 via a large open garage type doorway to briefly forage in flight, likely travelling the span of the buildings open roof structure (there are two interior dividing walls which stop at the bottom of the roof level, leaving the interior roof structure open along the span of the building), before leaving the room approx. 30 seconds later. The bat was observed to continue this behaviour regularly throughout the survey. A second Daubenton's bat arrived during the latter part of the survey and displayed a similar behaviour, foraging within the structure. At approx. 1 hr 22 before sunrise, one of the bats left the yard. Minutes later, the remaining bat entered under an edge roof slate (Plate 2).

Given that only individual bats were recorded roosting in Structure 1 during the typical maternity period, it is considered that both roost sites (interior of structure and end roof slate) are used on an occasional basis as day roosts. According to BCT Guidelines (Collins 2016) a day roost is "*A place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in summe*r".

On the 3rd of August at approximately 30 minutes after sunset, a single Common Pipistrelle bat was observed flying through an open doorway into Structure 2. The bat was observed flying around inside, likely searching for insects for approx. 50 seconds before emerging through a different doorway. Approximately 1 hr later, a single Myotis sp. bat, likely a Daubenton's Bat was observed displaying similar foraging behaviour for 2 minutes before it left the structure.

On the 12th of June 2023, at 23.29 (approx. 1.36hr after sunset), a single Brown Long-eared Bat was observed on camera silently flying into Structure 4 (S4) through a large window/opening at approx. 1.5m high. The camera footage covers part of the internal room, however the bat quickly disappeared out of view, appearing to drop low. After 12 seconds, the bat was observed slowly flying around inside the room for a

few seconds, likely foraging before emerging and emitting a single echolocation call. The bat then flew away from the yard in a southerly direction. This very brief visit is not consistent with a typical night or feeding roost given that the bat was inside the room for no longer than 15 seconds. Brown Long-eared Bats often make no sound and use eyes or ears to hunt by gleaning, (Swift and Racey 2002), and can be difficult to detect when foraging in understorey or other cluttered environments. This is perhaps why only one echolocation call was recorded during the survey.

It is considered that this behaviour, and the behaviour recorded at Structure 2 where a single Common Pipistrelle and *Myotis* sp. Bat was observed briefly flying around within the structure, was brief opportunistic foraging behaviour, and therefore there is no conclusive evidence to suggest that Structures 2 or 4 are bat roosts.

It is noted that surveys were slightly constrained by the presence of dense vegetation to the rear of structures S3 and S4 which prevented the use of cameras at these locations. It is noted however that the majority of access points to both of these structures were located along the open, surveyed aspects of the buildings.

The exclusion and subsequent loss of two Daubenton's bat day roost sites within Structure 2 will be required to facilitate the proposed development.

The loss of two Daubenton's bat day roost sites, and other roosting resources within proposed Application Site Boundary will be mitigated and compensated for with measures outlined below in Section 5. The implementation of such measures will ensure that there will be no significant adverse impact upon the local bat population resulting from the loss of roosting resources.

Proposed compensatory planting and SUDs features will provide significant resources for foraging bats within the operational phase of the proposed development, which will also incorporate a sensitive lighting strategy which will not give rise to adverse effects upon retained and proposed vegetation.

5 MITIGATION

All bat roosts are protected by law even when bats are not presently occupying a roost. A bat roost derogation licence must be obtained from the National Parks and Wildlife Service (NPWS), prior to demolition of any building with a bat roost, to permit otherwise illegal activities that will result in the destruction, damage and disturbance of known bat roosts. The licence will be issued to a suitably qualified bat ecologist who will supervise all licensed activities.

Demolition of any building with a known bat roost must take place between March - mid- May or September - October inclusive, of any given year, to avoid the bat maternity and hibernation seasons and minimise the impact on bats. A NPWS bat roost derogation/roost exclusion licence will be obtained prior to the commencement of demolition of Structure 1.

Prior to the demolition of the confirmed bat roost, Structure 1 (S1), and the other structures on site which have roosting suitability (S2-S6), the licenced ecologist will thoroughly search for the presence of roosting bats using an endoscope and torch. If bats are found to be present during demolition, species rescue and translocation will be carried out using gloves, and the bat(s) carefully transported to a nearby artificial bat roost. If a bat(s) is found roosting where it cannot be safely removed by hand, or where there are features with potential to conceal a roosting bat which cannot be sufficiently searched to confidently confirm that roosting bats are absent from the cavity, a bespoke designed bat exclusion device will be fitted around the roost entrance. Details of such measures will be included in the NPWS bat roost derogation licence method statement, as required.

All trees which have been confirmed to have Moderate or High bat roosting suitability will either have a dawn re-entry survey carried out or be inspected using an endoscope by a licenced ecologist immediately prior to felling. If any bats are found and cannot be safely removed by hand, the same measures stated above for structures will be applied.

4no. bat roost box locations are proposed within the site. These will comprise pole-mounted bat boxes, with two individual bat boxes proposed per location. Poles will be set in concrete or alternatively driven to a depth of at least 1m. Boxes themselves will be manufactured by Greenwood Ecohabitats[1] or similar, and will be erected, two per pole and fastened to the pole with metal straps or banding at a height of 3.5m or higher. These boxes are intended to compensate for the loss of numerous trees with bat roost potential which were not recorded to support bat roosts and to provide additional roosting resources for the local bat population. Greenwood Eco-Habitat artificial bat roost boxes are constructed from Ecostyrocrete and have a high bat uptake rate. The following boxes will be utilised, two per pole:

- ‘Half and Half bat box’ consist of a two-crevice design, and the other half of the box has the Small Hollow design, providing roosting opportunities for a wide range of bat species, or similar (Four no. total)
- Two crevice bat boxes, or similar. (Four no. total)

In addition to proposed bat box locations the proposals will incorporate three bat house structures. The exact design of these structures is yet to be finalised however it is proposed that one will be a blockwork structure with floor dimensions of three-by-three metres, with a pitched slate/slate tile roof with 1F felt underlay, bat-access slates and gaps in soffits and facia to facilitate access. The interior of this structure will include layers of spaced plywood or OSB between rafters to provide interior crevices (“squeeze boxes”)

[1] https://www.greenwoodsecohabitats.co.uk/shop

which will ensure that the structure is suitable for a variety of bat species. A door into this structure will be provided to facilitate access for monitoring and maintenance, as required.

The remaining two bat house structures will be constructed using a timber A-frame design utilising four square wooden corner posts set in concrete approximately 2.5m apart, raising the structure off the ground by approximately 1.8 or higher. The structures will have a pitched A-frame roof, constructed from sheet-metal, lined with OSB, gable walls constructed from wooden cladding, incorporating interior “squeeze box” features and no floor, allowing access from below.

An ECoW will provide advice on the exact design and location of artificial bat roosts however the initially proposed locations are shown on the project Landscape Masterplan (BSM-ZZ-ZZ-DR-L-0301) which accompanies the EIAR submissions. Proposed artificial bat roost boxes and bat houses are to be located along the southern site boundary to utilise the connectivity of the bluebell stream to the River Liffey, in addition to providing close access to proposed mitigation planting and SUDs features for foraging.

The Lighting Strategy for the proposed development has been designed in accordance with the Institution of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light (ILP 2011) and Bats and Artificial Lighting in the UK (ILP 2018).

Artificial lighting will only be installed where and when necessary, i.e. when it is needed for safety reasons or to comply with statutory guidelines. There will be no direct illumination of any artificial bat roosts. Lighting will be avoided in areas where existing trees are to be retained and in areas proposed for native woodland buffer planting. Lighting design will aim to use narrow spectrum lights with no UV content; directional downlights illuminating below the horizontal plane; bollard or low level downward directional luminaries; external security lighting should be set on motion-sensors and short (1 minute) timers; and use accessories such as baffles, shields, louvres or adjusting the angle of the lamp where necessary (ILP 2018).

Proposed bat box and house locations will be located within areas of the site which will not be subject to lighting levels greater than 0.1lux associated with the proposed development. Proposed mitigation planting will in the medium term, provide further attenuation of artificial lighting from off-site sources.

It is considered that the provision of these mitigation features will fully mitigate for the loss of roosts and potential roosts which will occur as a result of the proposed development. Furthermore these proposals will represent a significant enhancement of the site for roosting bats and will provide opportunities for maternity colonies and individual roosting bats which are not currently supported on the site.

6 CONCLUSION

The site, despite supporting a range of features with potential to support high levels of bat activity and roosts, was recorded to support relatively limited bat activity, of a low number of common and widespread bat species and only a single structure supporting two day-roost features utilised by a single probable Daubenton's bat, respectively.

The proposed development will involve the loss of areas of habitat of value for relatively low populations of foraging and commuting bats, a single confirmed roost and a range of features which have potential to support roosting bats.

With the implementation of mitigation and compensation measures outlined in Section 5, there will be no significant adverse impacts upon the local bat populations resulting from the proposed scheme. Furthermore it is considered that the proposals will deliver a significant enhancement for this group post-development.

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Plates

Plate 1: looking North at Structure (S1) at beginning of survey.

Plate 2: Looking North at Structure 1 (S1) during darkest part of survey. Red arrow shows the location of a confirmed bat roost access point under an end slate.

Plate 3: Looking Southwest at Structure 1 (S1) at beginning of survey.

Plate 4: Looking Southwest at Structure 1 (S1) during darkest part of survey.

Plate 5: Looking Southwest at Structure 2 (S2) at beginning of survey.

Plate 6: Looking Southwest at Structure 2 (S2) during darkest part of survey.

Plate 7: Looking West at Structure 2 (S2).

Plate 8: Looking East at Structure 2 (S2) at beginning of survey.

Plate 9: Looking east at Structure 2 (S2) during darkest part of survey.

Plate 10: Looking South towards Structure 3 (S3) at beginning of survey.

Plate 11: Looking South towards Structure 3 (S3) during darkest part of survey.

Plate 12: Looking West towards Structure 3 (S3) at beginning of survey.

Plate 13: Looking West towards Structure 3 (S3) during darkest part of survey.

Plate 14: Looking West towards Structure 4 (S4) at the beginning of the survey.

Plate 15: Looking West towards Structure 4 (S4) during the darkest part of the survey.

Plate 16: Looking Northeast towards Structure 4 (S4) at the beginning of the survey.

Plate 17: Looking Northeast towards Structure 4 (S4) during the darkest part of the survey.

Plate 18: Looking North at Structure 5 (S5) at beginning of survey.

Plate 19: Looking North at Structure 5 (S5) during the darkest part of the survey.

Plate 20: Looking West at Structure 6 (S6) at the beginning of the survey.

Plate 21: Looking West at Structure 6 (S6) during the darkest part of the survey.

Figures

Legend

- Site Boundary
- Low Bat Roost Potential
- Moderate Bat Roost Potential
- Broadleaved Scattered Tree

Buildings with Bat Roost Potential

- Low Bat Roost Potential
- Moderate Bat Roost Potential

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Client: Herbata Green Energy Data

Project: Herbata Data Centre Campus

Title: Trees and Structures with Roosting Bat Potential

Figure No. 1.0

Project No.	Date	Revision
NI2615	10.08.2023	D01

Legend

- Site Boundary
- T15
- T8

Buildings subject to Emergence/ Re-entry Survey

- Low Bat Roost Potential
- Moderate Bat Roost Potential

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Title: Trees and Structures Subect to Emergence/Re-entry Surveys

Figure No. 2.0

Project No.	Date	Revision
NI2615	10.08.2023	D01

Legend

- Site Boundary

Locations of Recorded Bat Passes

- Leisler's Bat
- Common Pipistrelle
- Soprano Pipistrelle
- Myotis species

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Project: Herbata Data Centre Campus

Title: Activity Survey Results: 16.05.23

Figure No. 3.0

Project No.	Date	Revision
NI2615	10.08.2023	D01

Legend

- Site Boundary

Locations of Recorded Bat Passes

- Leisler's Bat
- Common Pipistrelle
- Soprano Pipistrelle
- Myotis spec.

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Project: Herbata Data Centre Campus

Title: Activity Survey Results: 12.06.23

Figure No. 4.0

Project No.	Date	Revision
NI2615	10.08.2023	D01

Legend

- Site Boundary

Locations of Recorded Bat Passes

- Leisler's Bat
- Common Pipistrelle
- Soprano Pipistrelle

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Project: Herbata Data Centre Campus

Title: Activity Survey Results: 29.06.23

Figure No. 5.0

Project No.	Date	Revision
NI2615	10.08.2023	D01

Legend

- Site Boundary

Locations of Recorded Bat Passes

- Leisler's Bat
- Common Pipistrelle
- Soprano Pipistrelle

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Project: Herbata Data Centre Campus

Title: Activity Survey Results: 03.08.23

Figure No. 6.0

Project No.	Date	Revision
NI2615	10.08.2023	D01

Appendix I

Preliminary Roost Assessment of Structures

Preliminary Roost Assessment of Trees & Tree Climbing PRF Inspection Survey

Table A1.1: Preliminary Roost Assessment of Structures

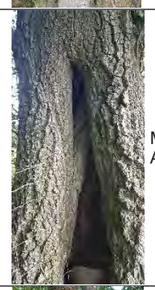
Structure No.	Date	Photo	Description	Evidence of Bats	Bat Suitability
S1 Former Garage/ Store	06.10.22		Agricultural building, 1-storey, partially rendered stone, pitched slate/asbestos cement slate roof, no felt or roof lining. Several interior gaps in stonework. Gaps in slates along southern wall plate. Relatively tight along the northern pitch with no visible gaps. Used by nesting swallows.	No	**Low/ Moderate**
S2 Former Stables	06.10.22		Agricultural building, 1-storey, rendered stone walls, pitched asbestos cement slate roof, no felt or roof lining, dense Ivy on parts of the roof. Interior is open with no cavities in stonework noted and limited gaps in interior timber offering potential roost opportunities. Interior is divided into several separate segments. Used by nesting swallows.	No	**Low**
S3 Derelict House	06.10.22		Two-storey former dwelling, largely lime-rendered stone. Pitched slate roof partially collapsed. Interior ceilings partially intact with gaps between ceiling and floorboards above. Chimney stacks have several gaps in brickworks, several gaps in slates along eastern aspect and at northern gable. Used by nesting swallows.	No	**Moderate**
S4 Thatched/ Tin Roof	06.10.22		Former thatched dwelling adjacent to S3. Tin has been laid over thatch and the whole roof has subsequently collapsed. Walls are constructed from stone and rubble. Remains of a former chimney stack have gaps in stonework.	No	**Moderate**

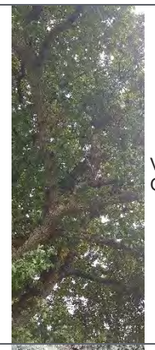
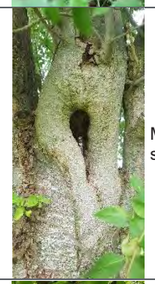
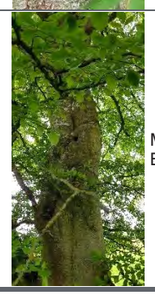
S5 Residential Garage	06.10.22		Single-storey garage structure, rendered blockwork walls, pitched tile roof, wooden facia, soffits and bargeboards. Cement under-cloaking at southern gable supports a large gap accessing between battens. No other gaps or other potential roost features noted.	No	**Low/ Moderate**
S6 Unoccupied House	06.10.22		Unoccupied bungalow. Rendered blockwork walls, pitched tile roof, wood facia and bargeboards with plywood soffits. Largely free of gaps, however eastern gable supports gaps in the end of the facia at the south-east corner and several gaps in cement under-cloak near the ridge. A hole is present in the eastern gable window, Appears to be used by nesting jackdaws.	No	**Low/ Moderate**
S7 Former outhouse close to S3	06.10.22		Small former outhouse. Single storey. Blockwork walls, pitched asbestos cement slate roof, no felt or roof lining. No gaps, cavities or other features offering bat roost potential noted.	No	**Negligible**
S8 Derelict former agricultural structure	06.10.22		Small former agricultural building which is derelict with no roof and is constructed from blockwork and stone and heavily colonised by brambles and ivy. No gaps or other features offering bat roost potential were noted to be present.	No	**Negligible**
S9 Derelict former agricultural structure	06.10.22		Former agricultural building. Roof largely collapsed, pitched corrugated metal. No roof lining or timber cavities with potential for roosting bats. Block and stone walls, no gaps or other features with bat roost potential noted.	No	**Negligible**

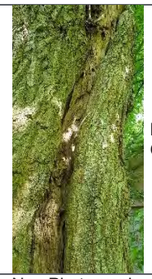
S10 Derelict former agricultural structure	06.10.22			Steel-framed barn. Corrugated sheet metal walls and roof. Open. No bat potential.	No	**Negligible**
S11 Recently constructed dwelling	06.10.22		No photograph available	Large two-storey dwelling along the northern boundary of the site constructed fairly recently from rendered block. Pitched tile roof with several dormer windows. PVC facia and soffits. All tightly finished. No bat potential.	No	**Negligible**
S12 Recently constructed garage.	06.10.22		No photograph available	1-storey garage, adjacent to S11 constructed fairly recently from rendered block. Pitched tile roof with PVC facia and soffits. All tightly finished. No bat potential.	No	**Negligible**
S13 Occupied dwelling	06.10.22		No photograph available	An occupied dwelling. 1-storey bungalow, constructed from rendered block, pitched and hipped tile roof. PVC and wood facia, soffits and bargeboards. Tightly finished. No bat potential.	No	**Negligible**

Table A1.2: Preliminary Roost Assessment of Trees & Tree Climbing PRF Inspections Surveys

Tree No.	PRF Inspection Date	Photo	Tree Species	Ground Level Description	Close Inspection Description	Evidence of Bats	Ground Level PRF Suitability	Tree Climbing PRF Suitability
T1	15/05/23 & 04/07/23		Mature Oak	• Hazard beams near top ground level PRF moderate BRS	• Three top transverse snap PRFs negligible BRS. • Slightly lower large limb break With tansverse snaps with gaps PRF moderate BRS	No	**MODERATE**	**MODERATE**
T2	“	No Photograph Available	Ash	• Basal rot hollow trunk, PRF moderate	• 15cm x 5cm, debris, moderate BRS.	No	**MODERATE**	**MODERATE**
T3	“	No Photograph Available	Ash	• Knot hole at 1m ground level PRF moderate	• Multi chambered, 8cm x11cm, PRF moderate	No	**MODERATE**	**MODERATE**
T4	“		Ash	• Basal rot, several cavities, ground level PRF moderate	• Entrance 45cm x 30cm, max depth 38cm up into cavaity, significantly narrower than external entrance, PRF moderate	No	**MODERATE**	**MODERATE**
T5	“	No Photograph Available	Ash	• Hazard beam at 4.5m PRF moderate	• Branch blown down PRF now negligible	No	**MODERATE**	**NEGLIGIBLE**

T6	“		Mature Beech	• Basal rot with hollows,,PRF moderate BRS	• Basal feature very large, >60cm up interior trunk. Could not be fully surveyed – high BRS. • Thick ivy PRF low.	No	**MODERATE**	**HIGH**
T7	“		Mature Beech	• Several knot holes on northern aspect PRF moderate •	• Knot hole on eastern aspect open, PRF neglible. • Knot hole on northern aspect shallow 6cm depth PRF low		**MODERATE**	**LOW**
T8	“		Mature Aspen	• Basal rot hollow trunk PRF moderate	• Only partially surveyed due to the discovery of breeding birds	No	**MODERATE**	**MODERATE**
T9	“		Multi-stem Ash	• Low transverse snaps and canker at 6m, PRF moderate	• Low trasverse snap very narrow exposed cavities and canker aerial PRF negligible	No	**MODERATE**	**NEGLIGIBLE**

T10	“		Veteran Oak	• Hollow broken branch at 4m, PRF moderate	• Open branch break aerial PRF negligible	No	**MODERATE**	**NEGLIGIBLE**
T11	“		Multi-stem Ash	• Knot hole at 2m S, and basal rot cavity PRF, moderate •	• Tear out 9cm x 6cm PRF moderate • Basal rot PRF moderate • New know hole on northern aspect 8cm x 8cm, PRF moderate	No	**MODERATE**	**MODERATE**
T12	“		Multi-stem Ash	• Knot hole at 3m on soutern aspect, PRF moderate	• Entrance wide 8cm x 8cm, interior wet PRF negligible	No	**MODERATE**	**NEGLIGIBLE**
T13	“		Mature Beech	• Knot hole at 3m on western aspect, PRF moderate	• Knot hole shallow max 6cm depth lots of slugs ,PRF low	No	**MODERATE**	**LOW**

T14	“		Mature Oak	• Bark and rotten limbs ground level PRF moderate	• Shallow features aerial PRF negliblie	No	**MODERATE**	**NEGLIGIBLE**
T15	“	No Photograph Available (see emergence survey footage stills, above).	Mature Crack Willow	• Basal rot hollow trunk ,PRF moderate	• Basal rot has two large cavities, one lateral and one vertical, 60cm x ≥10cm, low to ground. PRF High.	No	**MODERATE**	**HIGH**
T16	“	No Photograph Available	Mature Crack Willow	• Basal rot ,PRF moderate	• All cavities subject to endoscope. Some cavities 40cm x 3cm. Other cavities shallow. PRF moderate.	No	**MODERATE**	**MODERATE**
T17	“	No Photograph Available	Mature Beech	• Knot hole at 4.5m, PRF moderate	• Shallow feature no cavity, PRF neglibile	No	**MODERATE**	**NEGLIGIBLE**
T18	“	No Photograph Available	Mature Beech	• Knot hole at 3m and basal cavity, PRF moderate	• Superficial features, PRF negligible	No	**MODERATE**	**NEGLIGIBLE**
T19	“		Mature dying Aspen	• Dying aspen knot holes 3m and 4m N, moderate	• Features at 4m and above unsuitable. Knot hole at 3m int 28cm x 8. Domed apex. Spiders present. Moderate BRS.	No	**MODERATE**	**MODERATE**
T20	“		Middle-age Ash	• Small knot hole, 1,8m E aspect, 6cm x 6cm. Low	• All cavities subject to endoscope. Spired apex.	No	**LOW**	**LOW**