



Bat Activity, Emergence, and Endoscopic Surveys

Land to the North of the Old Brickworks,
Shoreham Road, Henfield

The Ecology Partnership, Thorncroft Manor, Thorncroft Drive, Leatherhead, Surrey KT22 8JB

T +44 (0) 1372 364133 **E** info@ecologypartnership.com **W** ecologypartnership.com

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LIABILITIES:

Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living creatures are capable of migration and whilst protected species may not have been located during the survey duration, their presence may be found on a site at a later date.

The views and opinions contained within this document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to or during works.

1.0 INTRODUCTION

Background

- 1.1 The Ecology Partnership was commissioned by DMH Stallard Ltd (on behalf of their client) to undertake a series of bat activity surveys for a site to the north of the Old Brickworks, Shoreham Road, Henfield, BN5 9SE, hereafter referred to as the 'site' (Figure 1).
- 1.2 The site (TQ595632) comprised a series of horse pasture fields, bounded by mature scrub, hedgerows and treelines.



Figure 1: Site red line boundary.

Proposed Development

- 1.3 The proposals for site are to redevelop the eastern and northern fields. Twelve new commercial units are planned, alongside their associated parking, access and landscaping. The westernmost field and a portion of the adjacent one are to be retained as green space for biodiversity net gain enhancement.

Legislation

- 1.4 Under the Natural Environment and Rural Communities (NERC) Act 2006, it is now the duty of every Government department in carrying out its functions *“to have regard, so far as it is consistent with the proper exercise of those functions, to the purpose of conserving biological diversity*

in accordance with the Convention". Seven species of bat (Barbastelle, Bechstein's, Noctule, Soprano pipistrelle, Brown long-eared, Greater horseshoe and Lesser horseshoe) are listed as Species of Principal Importance in England under Section 41 of the NERC Act.

1.5 All bats are covered by the following relevant legislation: the Wildlife and Countryside Act (WCA) 1981 (as amended); the Countryside and Rights of Way Act 2000; the Natural Environment and Rural Communities Act 2006; and by the Conservation of Habitats and Species Regulations (CHSR) 2010.

1.6 Under the WCA 1981 it is an offence to:

- Intentionally, recklessly or deliberately disturb a roosting or hibernating bat (i.e. disturbing it whilst it is occupying a structure or place used for shelter or protection).
- Intentionally or recklessly obstruct access to a roost (i.e. a structure or place used for shelter or protection).

1.7 Under the CHSR 2010 it is an offence to:

- Deliberately capture (or take), injure or kill a bat
- Intentionally, recklessly or deliberately disturb a bat, in particular (i) any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young; (ii) any disturbance which is likely to impair their ability in the case of hibernating or migratory species, to hibernate or migrate; or (iii) any disturbance which is likely to affect significantly the local distribution or abundance of the species to which they belong
- Damage or destroy a breeding site or resting place (roost) of a bat.

2.0 METHODOLOGY

Night-time Bat Walkover (NBW) Survey

2.1 NBW surveys were carried out once per season, on 23rd May, 23rd July and 19th September 2024. The surveys followed BCT guidelines (Collins, 2023). At the start of the survey, the surveyors were stationed on potential flight lines close to potential roost sources. The surveyor remained in position for 30 minutes before walking the predetermined transect route, during which bat flyovers and activity were recorded. The route was designed to follow features which bats are known to use as commuting corridors.



Figure 2: Transect routes (with start locations noted).

- 2.2 The surveys started at sunset and finished 2 hours after sunset. Bats usually emerge about twenty minutes after sunset depending on the species, light level, weather conditions and time of year. Peak activity will normally last for about two hours after sunset, during times of peak insect activity. Surveyors were equipped with Echo Meter Touch 2 Pro bat detectors.

Automated/Static Survey

- 2.3 Anabat Express detectors were deployed monthly between April and October. The detectors were positioned to determine levels of activity across the site, in relation to the proposed development. The recordings were analysed using Anabat Insight.

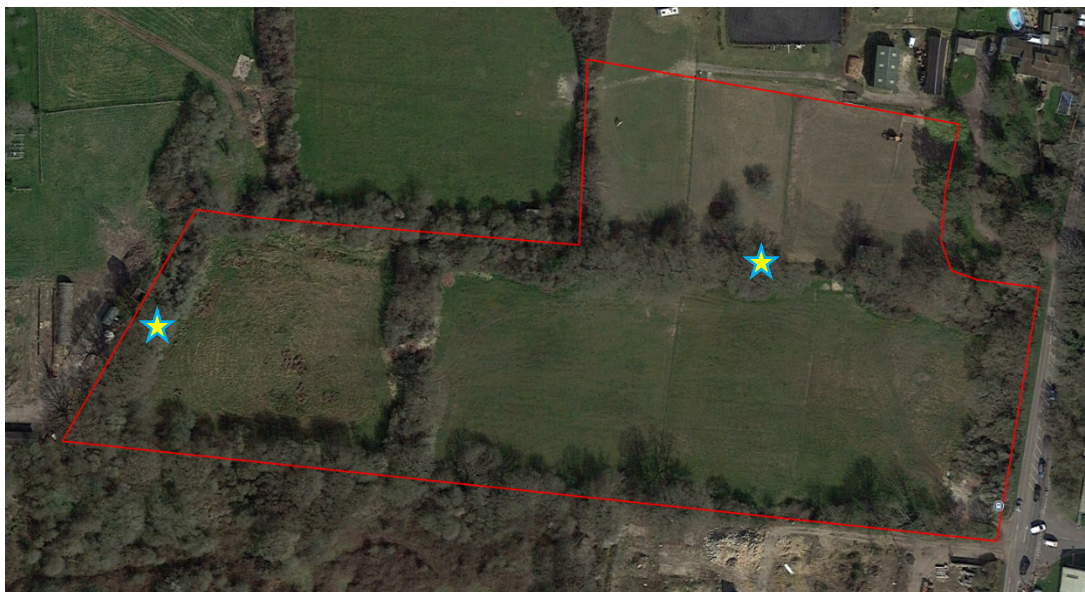


Figure 3: Location of Static Detectors – Location 1 (western boundary) and Location 2 (central east-west boundary).

Tree Emergence and Endoscopic Surveys

- 2.4 Two trees within the boundaries of site were shown to have potential to support roosting bats. T1 was an ash tree located on the east-west line of trees which divided the northern and southern fields. This had a large rot hole at the base, running up the trunk, considered likely to be a PRF-M from external inspection. There was also a woodpecker hole approximately two-thirds of the way up the trunk, considered likely to be a PRF-I. As no further inspection of the woodpecker hole was deemed viable, and the rot hole was classified as PRF-M, the tree was subject to three dusk emergence surveys.
- 2.5 The surveys followed BCT guidelines (Collins, 2023). These were conducted on 23rd July, 29th August, and 19th September 2024, commencing fifteen minutes before sunset and finishing an hour and a half after sunset. An infra-red camera was setup to observe the tree, supporting on surveyor, both equipped with Echometer Touch 2 Pro detectors.
- 2.6 The second tree, T2, was on the southern boundary and has two distinct PRFs. One was a small woodpecker/rot hole part way up one of the two main trunks, whilst the other was a large rot cavity running up the other trunk. Both were considered to have potential to be PRF-M features. As the PRFs were close to ground level, it was considered possible for further PRF inspection surveys to take place.
- 2.7 These PRF inspection surveys were conducted on two separate occasions, on 29th August and 19th September 2024. An endoscope and torch were used by a suitably qualified ecologist to inspect the cavities for signs of bat activity, to identify the full extent of the features, and to ascertain the conditions within them.
- 2.8 In addition to this, and as a final precaution, two bat emergence survey were undertaken observing T2. The decision was made for an additional precautionary survey series to take place, to provide supplementary evidence to the endoscope surveys. This was undertaken in the same format as those described for T1, on the 29th August and 19th September 2024.



Figure 4: Location of the two potential roost trees on site, T1 (north) and T2 (south).

Table 2. Survey dates and conditions.

Date	Survey Type	Start	Sunset	End	Temp.	Wind Speed (Beau.)	Cloud Cover (Oktas)	Precipitation
23/05/24	NBW	21:11	20:56	22:56	12-11	2	2-3	None
23/07/24	NBW	20:59	20:59	22:59	20-18	2	6-7	None
23/07/24	Emergence	20:44	20:59	22:29	20-18	2	6-7	None
29/08/24	Endoscope	-	-	-	-	-	-	-
29/08/24	Emergence	19:37	19:52	21:22	18-16	2	1	None
19/09/24	NBW	19:05	19:05	21:05	18-17	4	1	None
19/09/24	Endoscope	-	-	-	-	-	-	-
19/09/24	Emergence	18:50	19:05	20:35	18-17	4	1	None

3.0 RESULTS

Night-time Bat Walkover (NBW) Survey

23rd May 2024

- 3.1 The first bat recorded on this survey was a single soprano pipistrelle, which was recorded commuting along the southern boundary at 21:53. A second soprano pipistrelle was then observed towards the north-western corner of site, at 22:03. Only two other bats were recorded across the survey, a serotine passing across the north-western corner of site at 22:04, followed by a brown long-eared which was commuting along the central east-west hedgerow at 22:07. This was the last activity on the survey.

- 3.2 Activity levels overall were considered to be very low, with only four individual passes of bats all survey.

23rd July 2024

- 3.3 The first bat recorded during this survey was a single noctule, which was heard but not seen at 21:13, followed by a single common pipistrelle at 21:30, which was also heard but not seen. Soprano pipistrelle were the most frequently recorded bat across the survey, being first heard but not seen at 21:32, in the centre of the east-west boundary which divided the northern and southern fields. This was followed by two passes of a soprano pipistrelle in the same location, at 21:34. Soprano pipistrelle activity continued sporadically across the survey, all focused on the same east-west field boundary. Further commuting activity was picked up in this location at 21:41, 21:43, 21:46 and 22:25, all of which were heard, but not seen.
- 3.4 The only other activity on site was limited to three brown long-eared (BLE) calls, which were heard but not seen at 21:39, 22:13, 22:21 moving by the woodland on the eastern edge of site. The final bat activity recorded was the soprano pipistrelle at 22:35, which made three heard but not seen passes along the east-west central boundary.
- 3.5 Activity levels overall were considered to be low, with a small number of sporadic calls of common species.

19th September 2024

- 3.6 The first recorded activity on site was a Leisler's noctule, which was heard but not seen at 19:18.
- 3.7 Activity across the survey predominantly comprised common or soprano pipistrelles, focused primarily within the northern fields, or along the east-west dividing field boundary. Common pipistrelles were recorded foraging within the northern fields at 19:22, and 19:27, followed by a period of near constant activity between 19:29 and 19:37. There was also a final singular heard but not seen pass of a common pipistrelle at 19:53, along the south side of the east-west field boundary.
- 3.8 The first soprano pipistrelle activity was at 19:22, when one circled foraging in the northern fields for approximately two minutes. Multiple soprano pipistrelles were then recorded semi-continuously between 19:26 and 19:30, foraging within the northern fields. At 19:35 a single soprano pipistrelle was recorded moving in the southeastern field, near the southern boundary.

- 3.9 Bat activity other than pipistrelles was limited the initial Leisler's call at 19:18, a noctule at 19:25, which was heard but not seen, and finally a whiskered myotis at 20:11, which was recorded moving west along the northern boundary of the western fields.
- 3.10 The final bat activity of the survey was a single soprano pipistrelle at 20:32, which was heard but not seen on the eastern border of site.
- 3.11 Overall, activity levels were considered to be low, once again, with a small number of common species observed on site, calling semi-frequently.

Static Recorders

- 3.12 Two Anabat Express static recording devices were deployed across the site in April, May, June, July, August, September, and October (See Figure 4 for locations), for five consecutive days each.
- 3.13 For the purposes of this analysis, any *Myotis* species identified has been recorded as *Myotis spp.*. This is due to the uncertainty of identifying *Myotis* species to an exact species level, from the call pattern alone. It is considered that the majority of these calls comprised whiskered bats (*Myotis mustachinus*) and Brandt's bat (*Myotis brandtii*). This conclusion was based on comparing the calls patterns to archetype calls, and the fact that whiskered were identified in the NBW and both species featured prominently within local records.
- 3.14 In total 2,085 bat passes were recorded during the automated surveys, comprising a total of at least 8 species: common pipistrelle, soprano pipistrelle, *Myotis spp.*, noctule, Leisler's bat *Nyctalus leisleri*, brown long-eared *Plecotus auritus*, and serotine *Eptesicus serotinus*, in addition to individuals which could only be identified as 'big bats'.
- 3.15 The highest number of registrations was recorded at location two (central east-west field boundary), accounting for 52.23% of the total calls on site.
- 3.16 The activity on site was dominated by soprano pipistrelle, making up approximately 60.14% of the registrations. The majority of the remaining activity was dominated by common pipistrelle (21.25%), *Myotis spp.* (11.94%), and noctule (4.94%). All other species comprised the remaining 1.73%.

- 3.17 Despite location two having more bat passes, location one recorded more passes of soprano pipistrelle (33.09% of all calls), the most common species on site, and was the only location where brown long-eared bats were recorded.

Table 2. Number and percentage of registrations made by each species per Static location (Average per night – total number of registrations divided by total number of recording nights).

	Location 1 (Western)			Location 2 (Central)		
	Total Calls	Percentage	Average per Night	Total Calls	Percentage	Average per Night
'Big bat'	3	0.3	0.09	2	0.2	0.06
Brown long-eared	10	1	0.29	0	0	0
Myotis spp.	47	4.7	1.34	202	18.5	5.77
Noctule	37	3.7	1.06	66	6.1	1.89
Common pipistrelle	195	19.6	5.57	248	22.8	7.08
Soprano pipistrelle	690	69.3	19.86	564	51.8	16.11
Leisler's noctule	6	0.6	0.17	2	0.2	0.06
Serotine	8	0.8	0.23	5	0.5	0.14
TOTAL	996			1089		

Emergence Surveys

- 3.18 This section describes only the bat activity in relation to emergences from the features, for those days in which activity surveys (NBW) were also undertaken. Here, please refer to the appropriate date in NBW results section.

23rd July 2024 (T1 only)

- 3.19 There were no bats observed emerging from T1 during this survey, which was confirmed upon review of the IR footage.

29th August 2024 (T1 and T2)

- 3.20 The first activity on this survey was a singular noctule passing high over site at 20:21, shortly followed by a soprano pipistrelle passing along the southern boundary at 20:24. This was the only activity observed for the whole survey.
- 3.21 There were no bats observed emerging from either T1 or T2 during this survey, which was confirmed upon review of the IR footage.

19th September 2024

- 3.22 There were no bats observed emerging from either T1 or T2 during this survey, which was confirmed upon review of the IR footage.

Endoscopic Inspection Surveys

- 3.23 The two endoscope inspections found the small rot hole cavity, within T2, to be absent of bats or signs of bat activity. The full extent of the cavity was explored during these surveys.
- 3.24 In addition to this, the cavity itself was found to be much smaller than first predicted. Whilst the interior appeared dry, sheltered and likely relatively well insulated, the small size was more characteristic of a space able to support an individual or very small number of bats. As such, it was deemed appropriate to reclassify this as a PRF-I, instead of PRF-M.
- 3.25 The two endoscopic inspections found the extended rot cavity, within T2, to be absent of any bats or signs of bat activity. The full extent of the cavity was explored during these surveys.
- 3.26 In addition to this, the cavity was revealed to be open to the elements to a large degree, on the side facing away from the point of initial visual inspection. This included places where the branch curved and allowed exposure at the top, which could allow direct exposure to precipitation. Indeed, the interior of this cavity was found to be much damper than the corresponding PRF on the other limb, likely due to water ingress. Some limited drier space was available higher up within the feature, however, this was a small space, which was still relatively exposed to external conditions. This feature was characteristic of a space able to support an individual or very small number of bats, if any. As such, it was deemed appropriate to reclassify this as a PRF-I, instead of PRF-M.

4.0 DISCUSSION

- 4.1 The NBW surveys recorded low levels of bat activity within the site with the majority of the registrations from common and widespread UK species, most frequently, common and soprano pipistrelles.
- 4.2 The static detectors recorded an assemblage of at least eight species, six of which were considered to be at least widespread in many local geographies, apart from Leisler's bat and serotine. These are considered rarer or restricted in distribution, within the region, but made only 29 passes across site between them, over the entire survey period, a frequency of less than one per night (0.6). As such, the site is not considered to be a valuable resource to these rarer

species. Indeed, the site overall only had an average of 59.6 passes per day across the whole site, which is considered to represent a '**low**' level of activity.

4.3 Although it is not considered a major local resource for bats, efforts should be made to minimise the impact of the development on bats which use site. Most notably, a sensitive lighting scheme should be enacted across site, to maintain suitable light levels for bats to still pass across site. This lighting scheme should put particular focus on the central east-west treeline, where the most potential disruption is highest; the southern boundary, which remains the most intact linear feature on site; and the western field, which will provide the most valuable foraging resource post development. This sensitive lighting scheme should incorporate the following elements:

- Installing lighting only if there is a significant need;
- Using LED luminaires due to their lower intensity, sharp cut-off and good colour rendition – any lights with UV elements or metal halide lights should not be used;
- Lights with peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone 2012);
- Lights with an upward light ratio of 0% and good optical control;
- Careful consideration of column height to avoid light spill;
- Avoid putting lighting near tree lines or hedgerows and angling light away from these linear features which are used by commuting and foraging bats;
- Planting a barrier or using man-made features required within the scheme to form a barrier

4.4 Whilst no roosting activity was observed on site, roosting opportunities will be lost with the removal of T2 on the southern boundary. Endoscopic inspection reclassified the features within this tree as PRF-I, instead of PRF-M, and as such it is considered appropriate to mitigate the loss of these features via roost replacement actions.

4.5 Given that the loss will be of two small cavities within a tree, it is considered appropriate that two boxes be installed across site to replace these. A Schwegler 1FD bat box, or similar small cavity box, should be used, appropriate for smaller bats such as common and soprano pipistrelle, which were the most common species on site. These should be installed away from artificial lighting, at least 3m from the ground, facing south or southwest for suitable sun exposure, with an unobstructed entranceway extending at least 1.5m from the opening. These

could be installed in retained mature trees on site, on buildings away from artificial lighting and noise, or on poles installed along suitable boundaries.

- 4.6 T1 contained suitable features for use by bats but had no roosting activity identified within it across the three emergence surveys. This tree is currently marked as retained with pollarding to leave the features within an ecological monolith. As such, no specific additional mitigation is deemed necessary at this time.
- 4.7 Provided all of the above actions are implemented on site, it is considered highly unlikely that the proposed development will negatively impact the favourable conservation status of the species.

Roost enhancements - Bat boxes.

- 4.8 New roosting opportunities could be created on site by installing bat boxes on retained mature trees along the site boundaries, or possibly installed on posts. This will enhance the site for local bat populations and would provide further roosting opportunities. Recommended boxes include:

- Vivara Pro WoodStone Bat Box – A general purpose bat box that supports a range of species (Figure 7). These can be hung in a variety of heights and aspects in order to provide a variety of micro-climates.
- Large Multi Chamber WoodStone Bat Box – This is a multipurpose box designed for larger colonies and a range of bat species including pipistrelles, noctules and brown long-eared bats (Figure 7).



Figure 7: Vivara Pro WoodStone Bat Box (left) and Large Multi Chamber WoodStone Bat Box (right).

5.0 Conclusions

- 5.1 Overall, bat activity on site was generally considered to be 'low' levels. Whilst the majority of the physical components of the linear features on site will be retained, there is a risk of impacts caused by artificial lighting. A sensitive lighting scheme has been proposed throughout the development and will ensure the existing commuting/foraging flight paths are protected from negative impacts.
- 5.2 Two potential roost trees were found to contain no signs of roosting bat activity, through a combination of emergence surveys and PRF inspections. The first tree is to be retained and pollarded, with the potential roost features retained. The other potential roost tree, with two PRF-I features (confirmed during the inspection surveys), is planned to be removed during works. The loss of the two features within should be adequately compensated with two replacement bat boxes, installed in suitable locations on site. The installation of additional bat boxes beyond these features would provide enhanced opportunities for bats.

6.0 References

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7.0 APPENDIX 1 – STATIC RESULTS

Western Anabat – April 2024

	24/04/2024	25/04/2024	26/04/2024	28/04/2024	29/04/2024
BLE	0	0	0	1	0
Myotis spp.	0	0	0	2	0
Noctule	0	1	9	2	3
Com. Pip.	3	5	16	7	23
Sop. Pip.	5	25	13	18	20
Serotine	0	0	1	1	0
Total	8	31	39	31	46

Central Anabat – April 2024

	24/04/2024	25/04/2024	26/04/2024	27/04/2024	29/04/2024
Pip55	0	1	0	0	0
Total	0	1	0	0	0

Western Anabat – May 2024

	23/05/2024	24/05/2024	25/05/2024	26/05/2024	27/05/2024
Myotis	1	13	2	0	0
Noc	0	0	1	0	0
Pip45	0	3	8	0	0
Pip55	9	32	50	28	22
Total	10	48	61	28	22

Central Anabat – May 2024

	23/05/2024	24/05/2024	25/05/2024	26/05/2024	27/05/2024
Myotis	9	18	1	52	11
Noc		1	7		
Pip45	5	5	2	12	36
Pip55	7	32	61	79	67
Sero		1		1	1
Total	21	57	71	144	115

Western Anabat – June 2024

Row Labels	21/06/2024	22/06/2024	23/06/2024	24/06/2024	25/06/2024
BigBat		1			0
Pip45	12	8		7	0
Pip55	5	3	3	8	0
Total	17	12	3	15	0

Central Anabat – June 2024

	21/06/2024	22/06/2024	23/06/2024	24/06/2024	25/06/2024
Myotis	2				1
Noc	1				1
Pip45	1	4	11	13	4
Pip55	1	16	59	42	3
Total	5	20	70	55	9

Western Anabat – July 2024

	17/07/2024	18/07/2024	19/07/2024	20/07/2024	21/07/2024
Myotis	1		4	1	2
BLE	4	3	1		1
Noc	2	3	2	1	3
Pip45	2	3	2	2	2
Pip55	63	42	29	25	63
Leis			3		1
Big bat			2		
Sero				1	
Totals	72	51	43	30	72

Central Anabat – July 2024

	17/07/2024	18/07/2024	19/07/2024	20/07/2024	21/07/2024
Myotis	3	1			
Noc	5	20	7	16	4
Pip45	40	9	3	11	4
Pip55	22	12	10	7	7
Leis			2		
Totals	70	42	22	34	15

Western Anabat – August 2024

	25/08/2024	26/08/2024	27/08/2024	28/08/2024	29/08/2024
Leis	0	0	2	0	0
Myotis	0	0	0	1	0
Noc	1	0	1	2	1
Pip45	0	1	0	3	0
Pip55	31	37	16	46	63
Sero	5	0	0	0	0
Grand Total	37	38	19	52	64

Central Anabat – August 2024

	25/08/2024	26/08/2024	27/08/2024	28/08/2024	29/08/2024
BigBat	0	0	0	0	1
Myotis	0	0	4	3	4

Noc	0	0	0	1	1
Pip45	0	2	0	1	2
Pip55	0	2	3	1	2
Sero	0	0	0	2	0
Grand Total	0	4	7	8	10

Western Anabat – September 2024**NO DATA*****Central Anabat – September 2024***

	19/09/2024	20/09/2024	21/09/2024	22/09/2024	23/09/2024
BigBat	1				
Noc		1	1		
Pip45	54	14	14		1
Pip55	14	12	4	2	
Grand Total	69	27	19	2	1

Western Anabat – October 2024

	16/10/2024	17/10/2024	18/10/2024	19/10/2024	20/10/2024
Myotis	4	1	1	2	12
Noc	6				
Pip45	4				1
Pip55	10	8	2	4	10
Grand Total	24	9	3	6	23

Central Anabat – October 2024

	16/10/2024	17/10/2024	18/10/2024	19/10/2024	20/10/2024
Myotis	1	13	14	64	1
Pip55		11	57	29	1
Grand Total	1	24	71	93	2

The Ecology Partnership Ltd

Thorncroft Manor

Thorncroft Drive

Leatherhead

KT22 8JB

Tel: 01372 364 133

www.ecologypartnership.com

Approved: Alexia Tamblyn MA (Oxon) MSc CEcol CEnv CIEEM FRGS

Date: 04/11/2024