

**RESULTS OF BAT ACTIVITY TRANSECTS AND  
A REMOTE DETECTOR SURVEY ON LAND AT  
TREGODDICK FARM, MADRON,  
CORNWALL**

August 2018 &  
June 2021



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**RESULTS OF BAT ACTIVITY TRANSECTS AND A REMOTE  
DETECTOR SURVEY CARRIED OUT ON LAND AT  
TREGODDICK FARM, MADRON, CORNWALL**

**O.S. Grid Ref:** SW 454 319

**Survey period:** Activity transects: 14<sup>th</sup> and 28<sup>th</sup> August 2018  
and 16<sup>th</sup> June 2021  
Remote detector survey: 14<sup>th</sup> to 28<sup>th</sup> August 2018  
16<sup>th</sup> to 22<sup>nd</sup> June 2021

**Surveyor:** Martin Rule BSc  
Robin Curtis BSc MSc PhD

**Time spent on site:** 3 x 2 ¼ hours (Activity Transects)  
3 x ½ hour (deploying and collecting remote detector)

**Taxonomic groups:** Bats

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**Report completed:** 8<sup>th</sup> July 2021

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Update Final 1x

**Report for:** Mr Mark Clyndes

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**Document approved by:** Adrian Spalding PhD MCIEEM Director

**Signature:**



**Date:**

12<sup>th</sup> July 2021

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## 1. EXECUTIVE SUMMARY

Spalding Associates (Environmental) Ltd were instructed to carry out bat activity surveys and a remote detector survey on land at Tregoddick Farm, Madron, Cornwall in relation to proposals to develop the site for housing. The original surveys were carried out in 2018, these were updated in 2021.

The surveys aim to provide information on the level of use of the site by bats and to establish which species of bat make use of the site which can then be used to inform any mitigation necessary to reduce the proposal impact on bats.

Usually the minimum survey effort for a site of this size is three 2 ¼ hour transects coupled with three 5 day deployments of a remote detector to be spread across the active bat season. However, in 2018 it was deemed that a snapshot method would provide sufficient information to assess the use of this site by bats. This is because bat surveys were carried out previously in 2015 on a site in very close proximity, on Land off Aldreath Road to the north of the proposal site, and the proposal site is adjacent to residential housing on all sides.

Survey effort was carried out in 2018:

- One 2 ¼ hour manual activity transect, carried out on two occasions during the active bat season, April to October 2018
- Automated survey at one location for 14 consecutive nights between the two manual activity transects.

In 2021 these surveys were updated. Survey effort was carried out in 2021:

- One 2 ¼ hour manual activity transect, carried out on one occasion during the active bat season, April to October 2018
- Automated survey at one location for 7 consecutive nights in line with the activity transect.

### Results

#### *2018*

The survey results have shown that the site is used regularly for foraging and commuting by small numbers of Common Pipistrelles, with the most intensive activity recorded along the south eastern hedgebank. It is possible that these bats also roost close to the site as calls were regularly recorded close to sunset and sunrise.

In addition small numbers of Noctule have been shown to regularly fly over the site, and they may also occasionally forage over the site, and small numbers of a Myotis bat species have been shown to use the vegetated south eastern boundary for regular commuting, although they do not appear to use the site for regular foraging. There are no trees onsite with the potential to be used by roosting bats.

#### *2021*

The survey results reflect those of 2018 showing that the site is used regularly for foraging and commuting by small numbers of Common Pipistrelles, with the most intensive activity recorded along the south eastern hedgebank. In addition, small numbers of Noctule have been shown to regularly fly over the site, and they may also occasionally forage over the site. No Myotis bat species were recorded in 2021 therefore activity levels for this group seem to have reduced since 2018. It is not clear why this reduction would be as there seem to have been

very few changes in the surrounding landscape. There remain no trees onsite with the potential to be used by roosting bats.

### 2015

We previously undertook three bat activity surveys and remote detector surveys on an adjacent site of similar composition, immediately to the north of the proposal site, between August and October 2015. The results of this survey work showed that this site is regularly used for feeding by small numbers of Common Pipistrelles, which feed across the site, and for occasional feeding by Greater Horseshoes and Brown Long-eared bats, which appear to feed along the north eastern edge of the site away from the area of the site affected by light spill.

The results of the 2015 and 2018 survey work were broadly similar for Common Pipistrelles, in that small numbers of individuals of this species were regularly recorded foraging on each site during both survey periods. However no activity from Myotis bats was recorded in 2015. It is possible that individual Greater Horseshoes and Brown Long-eared bats shown to make use of the adjacent site in 2015 may also use the proposal site at Tregoddick Farm for occasional commuting across the landscape, although they are unlikely to regularly forage on site.

### Mitigation

To minimise the impacts of the proposed development the hedgebanks on site should be retained and as far as possible reinforced with native woody shrubs and trees which should be allowed to grow up to become established. Where possible a wildlife buffer of semi-natural vegetation should also be created and maintained alongside the boundary hedgebanks. This will help to protect the hedgebanks, ensure bats can continue to move along the hedgebanks and ensure all the species of bat currently using the site can continue to do so. Care should be taken to ensure that the hedgebanks do not become over-managed and degraded, ideally by keeping them outside the curtilage of the new properties.

The wildlife buffers should be planted with a native wildflower seed mix, extending at least 1 to 2 metres out from the hedgebank or boundary, and should be irregularly cut and not become over-managed. Any other areas of open space should ideally be managed in a wildlife friendly way with irregularly mown grassland and native planting.

Any lighting, either on the outside of buildings or street lighting, should be directed into the site and away from the boundary hedgebanks and boundary vegetation to ensure light spill onto the hedgebanks and adjoining habitats is kept to a minimum. This is because Myotis bats, Brown Long-eared bats and Greater Horseshoe bats will actively avoid lit areas and will stop using areas if they are lit.

New roosting opportunities for bats could be incorporated into the site in the form of prefabricated roosting provisions built into/onto the new dwellings and bat boxes erected onto trees on the boundary hedgebanks.

Overall, if the recommendations suggested in this report are adopted, the impact of the development on the local bat population and bats using the local landscape is likely to be low.

## 2. INTRODUCTION AND BACKGROUND

Spalding Associates (Environmental) Ltd were instructed by Mr Mark Clyndes to carry out bat activity surveys and a remote detector survey on land at Tregoddick Farm, Madron, Cornwall in relation to proposals to develop the site for housing. In 2018 two transects and a remote detector deployment were carried out. In 2021 a single transect and a remote detector survey were carried out.

### 2.1. Site description

The area surveyed is a hardstanding entrance track surrounded by introduced shrub leading to an area of rough grassland enclosed on three sides by Cornish hedgebanks. The site lies at the eastern edge of the village of Madron near Penzance in Cornwall. Directly adjacent to the north and west can be found relatively dense residential housing and roads, see Figure 1.

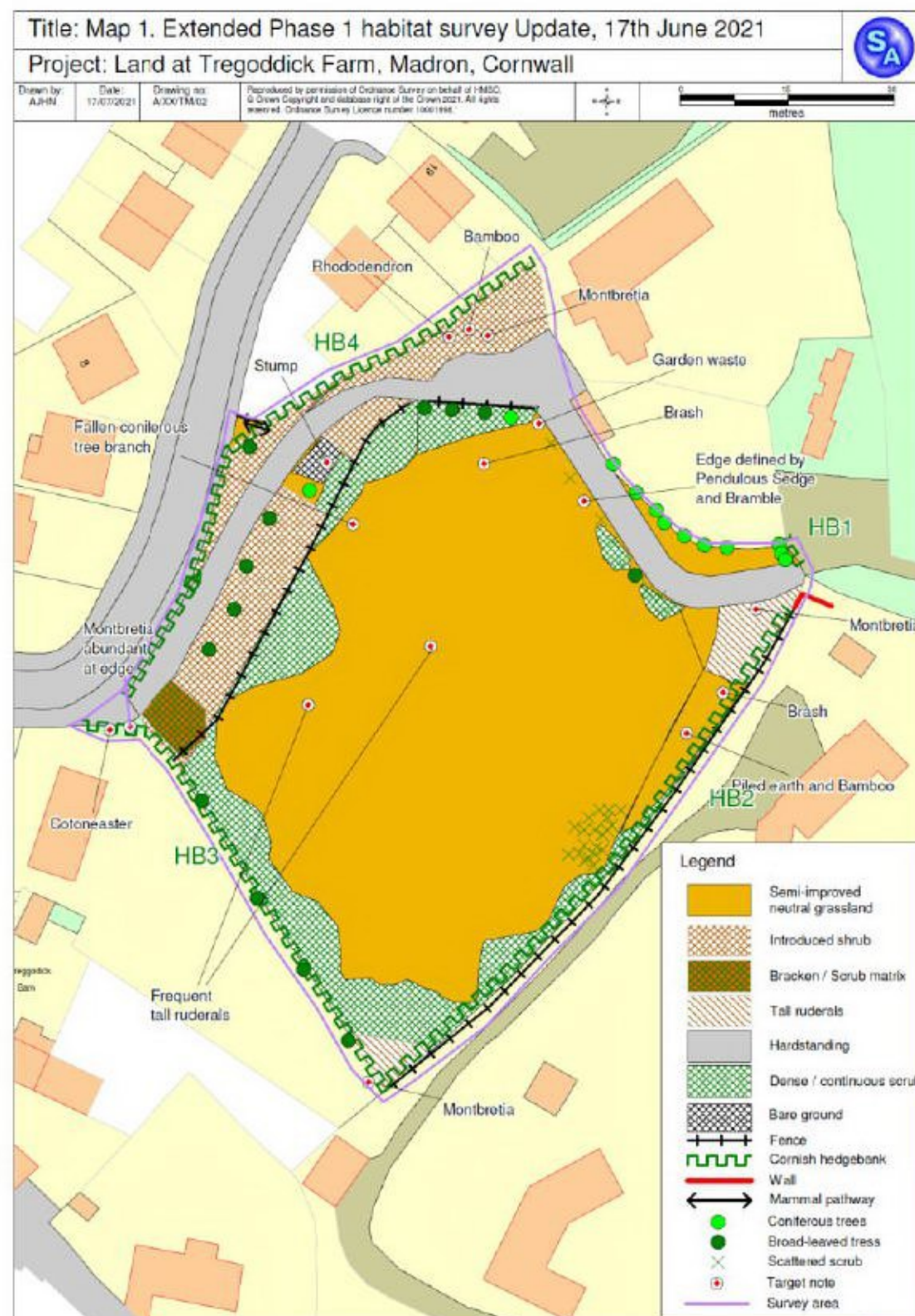


Figure 1. Extended phase one habitat survey map showing form of site

To the south and east are lower density residences set within generous gardens.

## 2.2. Proposed works

The proposal is to develop the site for housing including associated infrastructure.

## 2.3. Aims of survey work

These surveys aim to provide information on the level of use of the site by bats and to establish which species of bat make use of the site. This information has then been used to inform the planning application, establish if and what mitigation is required and assess the potential impacts of the proposed development on bats.

## 3. METHODS

Usually the minimum survey effort for a site of this size is three 2 ¼ hour transects coupled with three 5 day deployments of a remote detector to be spread across the active bat season. However in this instance it was deemed that a snapshot method would provide sufficient information to assess the use of this site by bats. This is because we have carried out bat activity transects and remote detector surveys previously in 2015 on a site in very close proximity, on Land off Aldreath Road to the north of the proposal site, and the proposal site is adjacent to residential housing on all sides.

The following survey effort was carried out in 2018:

- One 2 ¼ hour manual activity transect, carried out on two occasions during the active bat season, April to October 2018
- Automated survey at one location for 14 consecutive nights between the two manual activity transects.

This was updated in 2021 with:

- One 2 ¼ hour manual activity transect, carried out on a single occasions during the active bat season, April to October 2021
- Automated survey at one location for 7 consecutive nights following the activity transect

### 3.1. Manual Activity Transects

A single 2 ¼ hour manual dusk bat activity transect was walked on 14<sup>th</sup> and 28<sup>th</sup> August 2018 and 16<sup>th</sup> June 2021. As the site is fairly small each transect involved walking a set route around 6 static sampling points twice. The starting location was varied throughout the surveys to avoid any sampling bias, see Map 1.

At each sampling point a ten minute stop was made, during which time any bat activity observed was noted including the number of passes, direction of flight, form of activity (feeding or commuting) and species. Any passes observed between the sampling points were also noted. The survey aimed to establish the levels of bat activity across the site and the species present.

Table 1. Summary of the personnel, weather conditions, dates, order points walked, start and finish time and sunset time for each survey

Date	Surveyor	Order points walked	Weather			Temp (°C)		Time			Detector
			% Cloud cover	Wind	Precipitation	Start	End	Start	End	Sunset	
14 <sup>th</sup> Aug 2018	Martin Rule	1-6 x 2	20%	Light W breeze	Dry	17°C	16°C	20:28	22:43	20:43	BatBox Duet & Anabat SD2
28 <sup>th</sup> Aug 2018	Martin Rule	6-1 x 2	100%	Still	Dry	17°C	15°C	19:55	22:11	20:11	BatBox Duet & Anabat SD2
16 <sup>th</sup> June 2021	Robin Curtis	1-6 x 2	50%	V. light breeze	Dry	16°C	14°C	21:20	23:42	21:34	Batscanner Stereo & Anabat SD2

### 3.2. Automated (remote monitoring) surveys

An automated survey was carried out once in 2018 for 14 consecutive days between the two manual activity transects and once in 2021 for 7 consecutive days, see Map 1.

A remote monitoring device allows the levels of bat activity at a single location to be monitored over a number of nights thus providing much more detailed information about the use of that location by bats than activity transects can provide alone. The use of remote monitoring equipment also allows the activity of the whole night to be surveyed which is not practical using surveyors. During their deployment they log all the bat calls emitted by bats passing within their range and this can then be downloaded and analysed. In these instances an Anabat Express was used for the deployments.

The remote detector was deployed between 14<sup>th</sup> and 28<sup>th</sup> August 2018 and 16<sup>th</sup> and 22<sup>nd</sup> June 2021. The weather conditions during the 2018 survey period were mostly dry and clear with light to moderate winds and average night time temperatures of between 10°C and 17°C. The weather conditions during the 2021 survey period were mostly dry and clear with light to moderate winds and average night time temperatures of between 13°C and 16°C.

### 3.3. Surveyors

#### 3.3.1. Martin Rule

Martin Rule is an experienced bat surveyor with more than 10 years' experience of carrying out bat activity surveys and emergence surveys.

### 3.3.2. Robin Curtis BSc MSc PhD

Robin Curtis is a trained bat surveyor with over 2 years of experience with the use of bat detectors, undertaking emergence surveys, activity transects and analysing remote detector data.



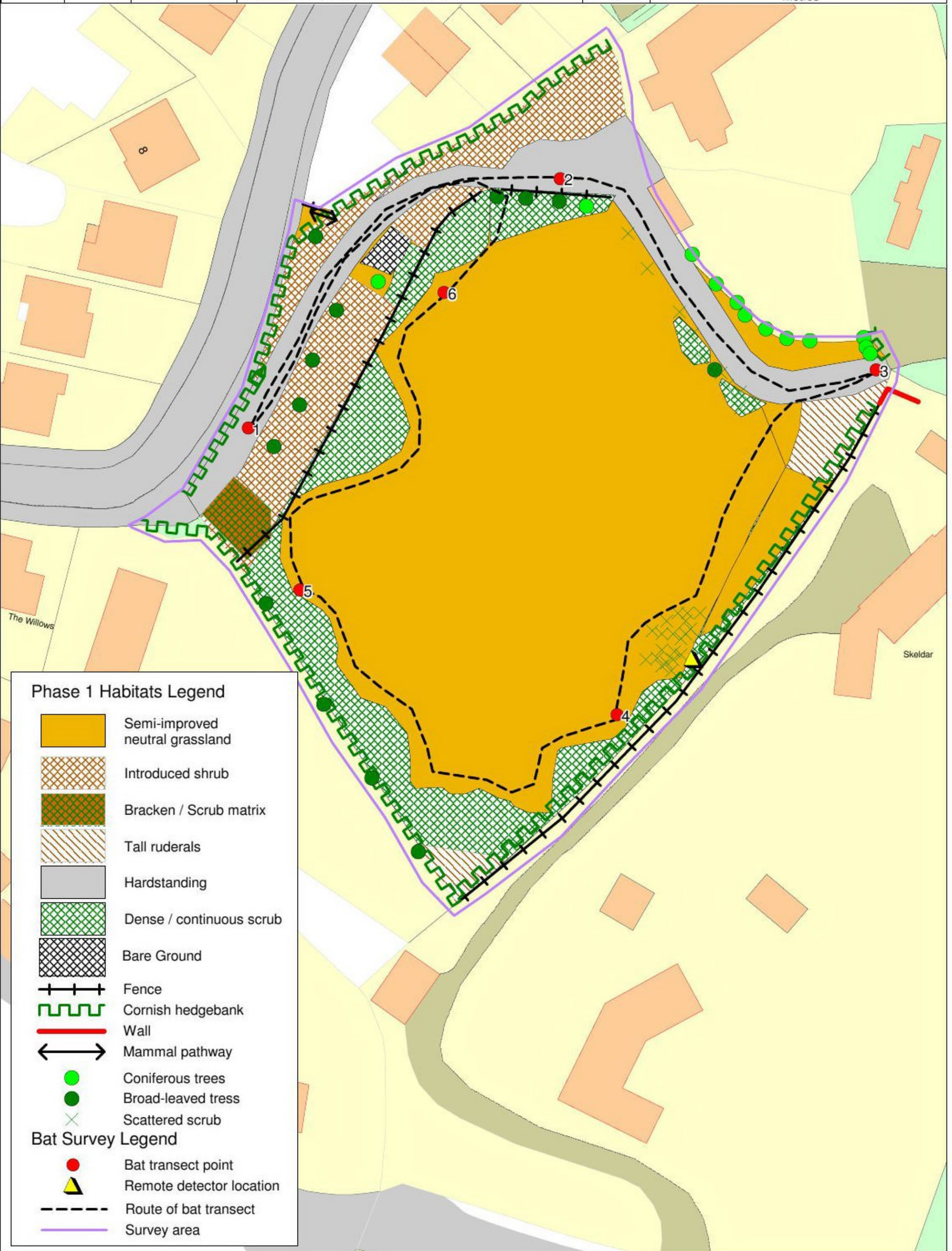
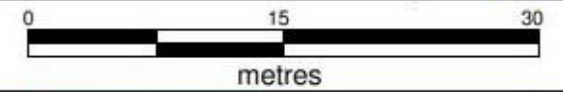


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Date:  
13/08/2021

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Phase 1 Habitats Legend

- Semi-improved neutral grassland
- Introduced shrub
- Bracken / Scrub matrix
- Tall ruderals
- Hardstanding
- Dense / continuous scrub
- Bare Ground
- Fence
- Cornish hedgebank
- Wall
- Mammal pathway
- Coniferous trees
- Broad-leaved trees
- Scattered scrub

Bat Survey Legend

- Bat transect point
- Remote detector location
- Route of bat transect
- Survey area

## 4. RESULTS

### 4.1. Results of the manual activity transects

Table 2. Summary of the results of the manual activity transects stating the number of bat passes and species encountered at each transect point along with notes on the features used where high levels of activity were noted.

Transect Point	14 <sup>th</sup> August 2018	28 <sup>th</sup> August 2018	16 <sup>th</sup> June 2021	Total number of passes per transect point
<b>Order of points</b>	1 to 6 x 2	6 to 1 x 2	1 to 6 x 2	
<b>Sunset</b>	20.43	20.11	21.34	
<b>First bat pass</b>	21.54	20.25	21.56	
1	-	-	-	No bat activity
2	-	1 x C. Pip pass	-	<b>1 x C. Pip pass</b>
3	-	2 x C. Pip passes	-	<b>2 x C. Pip passes</b>
4	-	1 x C. Pip pass	14x C.Pip passes 2x individuals feeding constantly	<b>15 x C. Pip pass</b>
5	-	-	3 x C. Pip passes 2 x Noctule Passes	<b>3 x C. Pip passes 2 x Noctule passes</b>
6	-	1 x C. Pip pass	-	<b>1 x C. Pip pass</b>
1	-	2 x C. Pip passes	1 x Noctule pass	<b>2 x C. Pip passes 1 x Noctule pass</b>
2	-	1 x C. Pip pass	-	<b>1 x C. Pip pass</b>
3	1 x C. pip pass	3 x C. Pip passes from 3 individuals commuting along hedgebank	2 x C. Pip passes 2 x Noctule Passes	<b>6 x C. Pip passes 2 x Noctule Passes</b>
4	-	-	-	No bat activity
5	1 x C. Pip pass	-	1 x Noctule Pass	<b>1 x C. Pip pass 1 x Noctule Pass</b>
6	-	-	-	No bat activity
<b>Totals</b>	<b>2 x C. Pip passes</b>	<b>11 x C. Pip passes</b>	<b>19 x C. Pip passes 6 x Noctule Passes</b>	<b>32 x C. Pip passes 6 x Noctule Passes</b>
<b>Key to species shorthand:</b> C. Pip – Common Pipistrelle				

In total a relatively low number of bat passes were recorded during the three manual activity transects. A total of 38 bat passes were recorded, the majority of which were from Common Pipistrelles (32 passes) with a lower number by Noctule bats (6 passes). The transect carried out on 14<sup>th</sup> August only recorded 2 Common Pipistrelle passes throughout the survey, one at transect point 3 in the east and one at transect 5 in the west of the site, whereas a total of 11 Common Pipistrelle passes from up to three individuals were recorded during the transect carried out on 28<sup>th</sup> August at all transect points, except point 5. On 16<sup>th</sup> June 2021 activity from Common Pipistrelles was recorded at all points except points 2 and 6; Noctule passes were recorded at points 1, 3 and 5.

In 2018 the highest levels of activity were recorded along the south eastern boundary hedgebank, with up to three Common Pipistrelles recorded commuting along this feature during the second 2018 activity transect. The observations from 2021 match this with up to two Common Pipistrelles recorded feeding and commuting along this feature during the activity transect.

#### 4.2. Results of the automated (remote monitoring) survey

##### 4.2.1. Remote detector deployment, 14<sup>th</sup> to 28<sup>th</sup> August 2018 and 16<sup>th</sup> to 22<sup>nd</sup> June 2021

This detector was placed on a tree on the south eastern boundary hedgebank, see Map 1.

Table 3. Summary of the results of the remote detector deployment

Date	Species	Number of Calls	Time Of First Call	Time Of Last Call
14 <sup>th</sup> to 15 <sup>th</sup> August 2018	Common Pipistrelle	51	21.08	05.41
	Myotis	2	04.23	04.34
	Noctule	6	03.24	05.22
15 <sup>th</sup> to 16 <sup>th</sup> August 2018	No bat activity recorded			
16 <sup>th</sup> to 17 <sup>th</sup> August 2018	Common Pipistrelle	50	21.02	05.38
	Noctule	3	21.03	04.15
17 <sup>th</sup> to 18 <sup>th</sup> August 2018	Common Pipistrelle	59	21.40	05.56
	Myotis	2	22.45	03.19
	Noctule	5	23.39	05.28
18 <sup>th</sup> to 19 <sup>th</sup> August 2018	Common Pipistrelle	18	20.53	04.06
	Noctule	3	23.35	03.18
19 <sup>th</sup> to 20 <sup>th</sup> August 2018	Common Pipistrelle	2	05.07	05.07
	Noctule	3	21.02	21.44
20 <sup>th</sup> to 21 <sup>st</sup> August 2018	Common Pipistrelle	3	21.53	22.31

## RESULTS OF BAT ACTIVITY SURVEYS CARRIED OUT ON LAND AT TREGODDICK FARM, MADRON, CORNWALL

August 2018

	Myotis	1	21.19	-
	Noctule	2	20.50	22.19
21 <sup>st</sup> to 22 <sup>nd</sup> August 2018	Common Pipistrelle	29	20.53	05.46
	Noctule	5	20.59	04.42
	Myotis	7	23.13	05.33
22 <sup>nd</sup> to 23 <sup>rd</sup> August 2018	Noctule	1	20.48	-
23 <sup>rd</sup> to 24 <sup>th</sup> August 2018	Common Pipistrelle	38	20.48	05.59
	Noctule	4	21.31	06.04
	Myotis	1	01.38	
24 <sup>th</sup> to 25 <sup>th</sup> August 2018	Common Pipistrelle	6	21.24	01.43
	Noctule	2	21.31	01.04
25 <sup>th</sup> to 26 <sup>th</sup> August 2018	Common Pipistrelle	296	20.03	04.06
	Myotis	6	21.45	01.19
26 <sup>th</sup> to 27 <sup>th</sup> August 2018	Common Pipistrelle	10	20.31	04.06
	Noctule	1	00.16	-
27 <sup>th</sup> to 28 <sup>th</sup> August 2018	Common Pipistrelle	75	20.20	05.41
	Noctule	6	21.02	05.26
	Myotis	2	21.54	05.10
16 <sup>th</sup> to 17 <sup>th</sup> June 2021	Common Pipistrelle	36	20.56	03.52
	Noctule	2	21.35	21.59
17 <sup>th</sup> to 18 <sup>th</sup> June 2021	Common Pipistrelle	41	21.06	21.23
18 <sup>th</sup> to 19 <sup>th</sup> June 2021	Common Pipistrelle	23	21.17	03.49
19 <sup>th</sup> to 20 <sup>th</sup> June 2021	Common Pipistrelle	321	20.52	03.57
20 <sup>th</sup> to 21 <sup>st</sup> June 2021	Common Pipistrelle	34	21.14	04.17
	Noctule	3	22.16	22.26
21 <sup>st</sup> to 22 <sup>nd</sup> June 2021	Common Pipistrelle	31	21.31	04.13
	Noctule	1	12.43	12.43
22 <sup>nd</sup> to 23 <sup>rd</sup> June 2021	Common Pipistrelle	29	21.27	04.10
Total	Common Pipistrelle		1204	
	Noctule		47	
	Myotis		23	

During the remote detector deployments a total of 1274 bat calls was recorded with calls being recorded throughout the nights. Calls from three species of bat were recorded, including a moderate to high number of calls from Common Pipistrelles on all 19 nights, with the majority of calls recorded close to sunset and sunrise, with a low number of calls recorded from Noctules on 15 nights. A low number of calls from a Myotis bat species were recorded on seven nights in 2018 however no myotis calls were recorded in 2021. Table 4. summarises the remote detector data for 2021 only.

Table 4. Summary of number of calls Tregoddick, Madron 16<sup>th</sup> 22nd June 2021.

Species	No. of calls	Number of Nights	% of calls
Common Pipistrelle	565	7/7	98.9%
Noctule	6	3/7	1.1%
<b>Total</b>	<b>571</b>		<b>100%</b>

The remote detector surveys reflect the results of the activity transects with small numbers of Common Pipistrelles being encountered commuting along the south-eastern hedgebank and a low number of passes by Noctule bats. However, no Myotis species were recorded during manual activity transects in 2018 but were recorded by the remote detector. No Myotis species were recorded on the remote detector or during the activity transects in 2021.

On 25<sup>th</sup> August 2018 a very high number of calls from Common Pipistrelles were recorded (298 calls, 42% of the total number of calls). The average night time temperature was between 10°C and 12°C on the night of 25<sup>th</sup> August, which was the coldest night out of the 14 day deployment. This may have increased the overall level of bat activity on site as bats may have been trying to find enough prey. A similar scenario occurred on 19<sup>th</sup> June with 321 calls from Common Pipistrelle recorded on this night, this was also a colder than average night the temperature being around 13°C.

No bat activity was recorded on 15<sup>th</sup> August 2018.

#### 4.2.2. Summary of remote detector survey

Overall the results of the remote detector survey indicate that the site is regularly used by a small number of Common Pipistrelles which commute and forage along the south eastern hedgebank throughout the night, sometimes foraging fairly intensively. It is possible that these bats also roost close to the site as calls were regularly recorded close to sunset and sunrise.

The results also indicate that small numbers of Noctule regularly fly over the site and they may also occasionally forage over the site. Small numbers of a Myotis bat species were using the vegetated south eastern boundary for regular commuting in 2018, although thought not to use the site for regular foraging. There is no evidence from the 2021 surveys to suggest they are still using the site therefore it is reasonable to assume they may use the site only occasionally.

#### 4.3. Comparison between 2015 and 2018 survey results

We previously undertook three bat activity surveys and remote detector surveys on an adjacent site of similar composition, immediately to the north of the proposal site, between August and October 2015. The results of this survey work showed that this site is regularly used for feeding by small numbers of Common Pipistrelles, which feed across the site, and for occasional feeding by Greater Horseshoes and Brown Long-eared bats, which appear to feed along the north eastern edge of the site away from the area of the site affected by light spill.

The levels of bat activity recorded during the 2015 surveys are fairly consistent with the results of the 2018 survey work, with small numbers of Common Pipistrelles regularly encountered foraging and commuting across the adjacent site during the 2015 manual activity transects and moderate to high numbers of calls from this species recorded during the remote detector surveys. The number of calls recorded during the August and October 2015 remote detector surveys indicate that Common Pipistrelles occasionally forage over the adjacent site fairly intensively, with between 4 and 262 calls recorded on all nights.

In addition a single call from a Greater Horseshoe bat was recorded on two nights during the September 2015 remote detector survey and between 1 and 2 calls from a Brown Long-eared bat were recorded on two nights during the same deployment. However no activity from *Myotis* bats was recorded in 2015.

#### 4.4. Summary of all survey works

The survey results have shown that the site is used regularly for foraging and commuting by small numbers of Common Pipistrelles, with the most intensive activity recorded along the south eastern hedgebank. It is possible that these bats also roost close to the site as calls were regularly recorded close to sunset and sunrise.

In addition small numbers of *Noctule* have been shown to regularly fly over the site, and they may also occasionally forage over the site, and small numbers of a *Myotis* bat species have been shown to use the vegetated south eastern boundary for regular commuting, although they do not appear to use the site for regular foraging and were not recorded in 2021.

Overall the level of bat activity recorded at this site was relatively low, although on one night during both of the remote detector deployments higher numbers of calls were recorded throughout the night. These were 25<sup>th</sup> August, 298 calls from Common Pipistrelles and 19<sup>th</sup> June, 321 calls from Common Pipistrelles. This indicates that they occasionally forage over the site fairly intensively. However, the drop in temperature on these nights may have encouraged bats to forage more intensively over the site in order to find enough prey, therefore increasing the overall level of Common Pipistrelle activity recorded on site during these nights.

It is not clear why there was no bat activity recorded on 15<sup>th</sup> August 2018 as the weather conditions were ideal for bat activity, with average night time temperatures of between 16°C and 17°C and clear and dry weather conditions.

The results of the 2015 survey work undertaken on the adjacent site to the north also regularly recorded small numbers of Common Pipistrelles foraging on site, sometimes fairly intensively. In addition the 2015 results indicate that it is possible that individual Greater Horseshoes and Brown Long-eared bats may also use the proposal site at Tregoddick Farm for occasional commuting, although they are unlikely to regularly forage on site.

There are no trees onsite with the potential to be used by roosting bats.

## **5. ASSESSMENT**

### **5.1. Common Pipistrelle**

The 2018 survey results indicated that the site is used regularly for foraging and commuting by small numbers of Common Pipistrelles, with the most intensive activity recorded along the south eastern hedgebank. The timing of the activity recorded indicates that individuals of this species are likely to be roosting near to the site. Results from 2021 indicate activity levels on site are largely the same for this species. The level of Common Pipistrelle activity recorded during the 2015 survey work on an adjacent site was broadly similar.

Common Pipistrelles are a fairly light tolerant species and cope with urbanisation of habitats fairly well. As long as care is taken to ensure light spill into the adjoining habitats and up onto the boundary hedgebanks is kept to a minimum, the proposed development should not significantly adversely impact the Common Pipistrelles using this site and they will also feed over the gardens of the new properties.

### **5.2. Noctule**

Both 2018 and 2021 results suggest that this site is being regularly used by small numbers of Noctules which fly over the site, and they may also occasionally forage over the site.

Noctules are a fairly light tolerant species and cope with urbanisation of habitats fairly well. As long as the hedgebanks bounding the site are retained and do not become over-managed and as long as care is taken to ensure light spill into the adjoining habitats and back up onto the boundary hedgebanks is avoided, the proposed development should not significantly adversely impact Noctules.

### **5.3. Myotis bat sp.**

The 2018 results indicated that the site appeared to be regularly used for commuting by small numbers of a Myotis bat species, which were shown to use the vegetated south eastern boundary. However, it was concluded that it was unlikely that they use the site itself for regular foraging. In 2021 no calls from this species were recorded. Therefore, activity levels appear to have reduced since 2018 for this group although it is probable they would use the site occasionally. It is not clear why this reduction would be as there seem to have been very few changes in the surrounding landscape.

Myotis bats are very intolerant to light and so ideally the hedgebanks which bound the site should not be lit and that artificial lighting spill into the adjoining habitats should be kept to a minimum. This would ensure that Myotis bats can continue to commute along the site boundaries and feed within the habitats adjoining it.

In addition the hedgebanks bounding the site should be retained and reinforced with native woody planting wherever possible, which should be allowed to grow up to become established. Care should be taken to ensure that they do not become over-managed and degraded. This will help to minimise the impact of the proposed development on the Myotis bats shown to make use of the site.

## 6. MITIGATION

To minimise the impacts of the proposed development the hedgebanks on site should be retained and as far as possible reinforced with native woody shrubs and trees which should be allowed to grow up to become established. Where possible a wildlife buffer of semi-natural vegetation should also be created and maintained alongside the boundary hedgebanks. This will help to protect the hedgebanks, ensure bats can continue to move along the hedgebanks and ensure all the species of bat currently using the site can continue to do so. Care should be taken to ensure that the hedgebanks do not become over-managed and degraded, ideally by keeping them outside the curtilage of the new properties.

The wildlife buffers should be planted with a native wildflower seed mix, extending at least 1 to 2 metres out from the hedgebank or boundary, and should be irregularly cut and not become over-managed. Any other areas of open space should ideally be managed in a wildlife friendly way with irregularly mown grassland and native planting.

Any lighting, either on the outside of buildings or street lighting, should be directed into the site and away from the boundary hedgebanks and boundary vegetation to ensure light spill onto the hedgebanks and adjoining habitats is kept to a minimum. This is because Myotis bats, Brown Long-eared bats and Greater Horseshoe bats will actively avoid lit areas and will stop using areas if they are lit.

- Any lighting should be highly directional and cowed
- Lighting and light levels should be kept to a minimum, using only the amount of light needed for safety and lighting mounted onto the outside of properties should ideally be triggered lighting so that it is not on constantly
- Lighting columns should be at a low height and the use of bollard lights should be considered
- No light sources should be pointing upwards. The spread of light should be kept near to, or below, the horizontal
- Light-spill should be reduced so that light reaches only areas needing illumination



- Shielding or cutting light can be achieved through the design of the luminaire or with accessories, such as hoods, cowls, louvers and shields to direct the light
- Only narrow spectrum bulbs should be used to lower the range of species affected by lighting
- No light spill should fall onto the boundary hedgebanks or adjacent wildlife buffers

### **6.1. Enhancements for roosting bats**

New roosting opportunities for bats could be incorporated into the site in the form of prefabricated roosting provisions built into/onto the new dwellings and bat boxes erected onto trees on the boundary hedgebanks.

Overall, if the recommendations suggested in this report are adopted, the impact of the development on the local bat population and bats using the local landscape is likely to be low.

## **7. LEGISLATION**

Bats in England have been protected under a number of regulations and amendments but the most up-to-date and relevant are:

- The Conservation of Habitats and Species Regulations 2010 (Regulation 41)
- Wildlife and Countryside Act 1981 (Section 9)

The result of Regulations and Acts is that all species of bat and their breeding sites or resting places (roosts) are protected under law. It is an offence to:

- Deliberately capture, injure or kill a bat
- Deliberately disturb a bat in a way that would affect its ability to survive, breed or rear young or significantly affect the local distribution or abundance of the species
- Intentionally or recklessly disturb a bat at a roost
- Intentionally or recklessly obstruct access to a roost whether bats are present or not
- Damage or destroy a roost whether bats are present or not
- Possess, control, transport, sell exchange or offer for sale/exchange any live or dead bat or any part of a bat

Through the Conservation (Natural Habitats &c.) Regulations 1994 (this has been updated and consolidated with subsequent amendments by the Conservation of Habitats and Species Regulations 2010 mentioned above) bats were designated a European protected species as part of Europe wide effort to conserve certain plant and animal species.

Any development which is likely to result in the disturbance of a European protected species, or damage to its habitat usually requires a European protected species licence from Natural England. 'Development' is interpreted broadly to include projects involving demolition of buildings, rebuilding, structural alterations and additions to buildings.