



# **Policy FB12 Feasibility Study Bat Appraisal Addendum**

Produced for Hastings Borough Council

By Applied Ecology Ltd

July 2014



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# 1 Introduction

- 1.1 Applied Ecology Ltd (AEL) was commissioned by Hastings Borough Council to review available ecological information relating to a site allocated for wind energy development in the Hastings Development Management Plan (Revised Proposed Submission Version 2014). The site has reference Policy FB12 – Land south of Upper Wilting Farm, and is shown in **Figure 1.1**.
- 1.2 A feasibility study relating to the potential for wind energy development at this site was produced in July 2013<sup>1</sup>, and covered a range of relevant topic areas, including an ecological appraisal.
- 1.3 In June 2014, concerns were raised by Hastings Borough Council that the feasibility study had not fully considered potential effects on local bat populations which might have some bearing on the feasibility of the site.
- 1.4 Relatively few wind turbine-related bat deaths have been reported in the UK, although it is thought that this could be as a result of a lack of post-construction monitoring. Effects of turbines on bats may either be as a result of direct collision, or barotrauma (whereby a change in air pressure causes fatal damage to a bats respiratory system).
- 1.5 Further research and evidence is required to inform the assessment of bat collision risk, and studies in this are underway at Bristol and Stirling Universities. In the absence of empirical data, it is only possible to make judgments and provide advice about the likely effects of turbines on bats, based on the current limited knowledge-base.
- 1.6 This report is therefore an Addendum to the July 2013 feasibility study, aiming to provide a preliminary assessment of bat activity and interest on the FB12 site, based on field sampling by AEL in July 2014. Information is also provided as to how these factors could be managed in the context of a wind turbine development.

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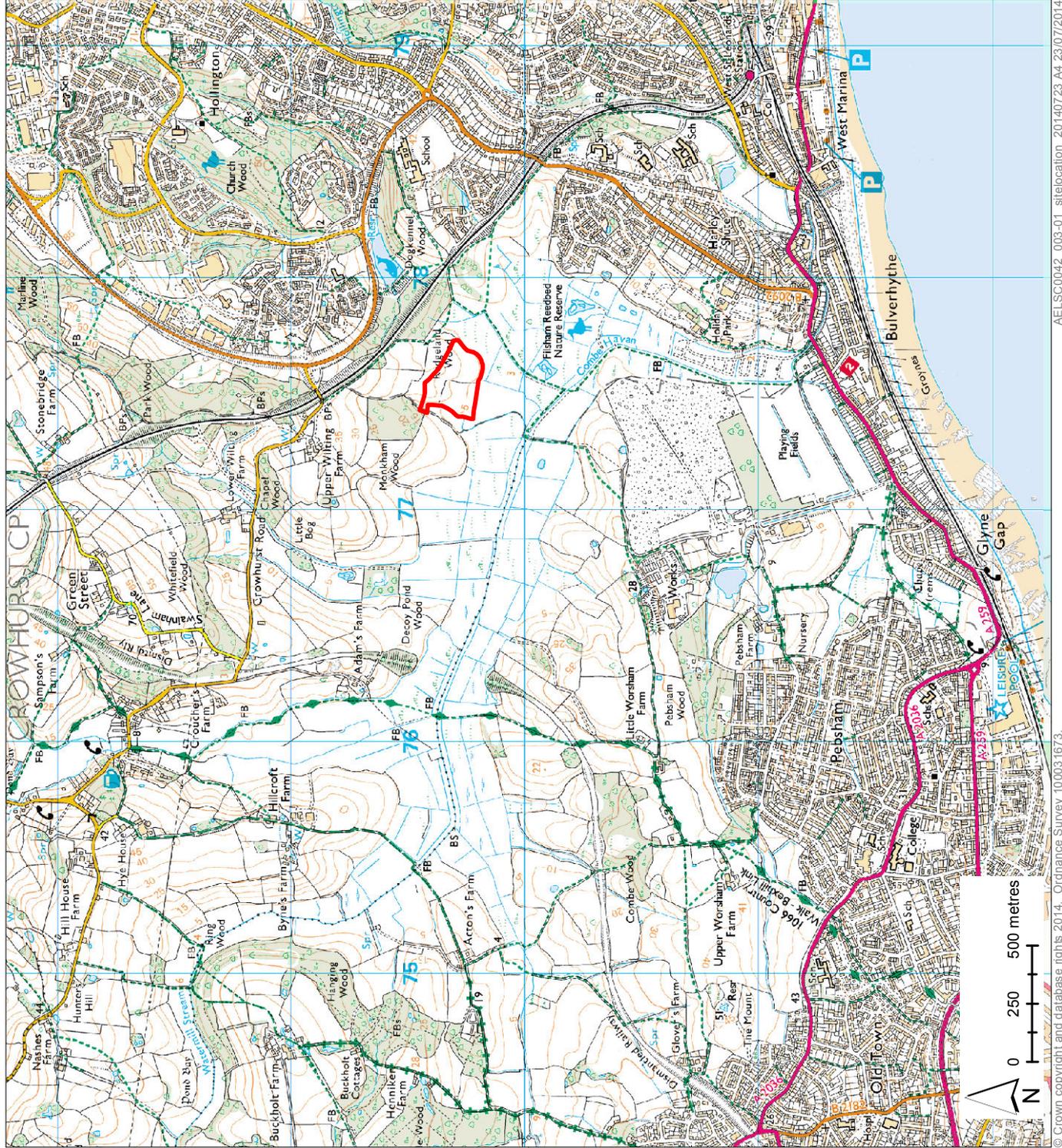
<sup>1</sup> **Chris Blandford Associates (2013)**. *Upper Wilting Farm Wind Turbine Feasibility Assessment*. Contract report produced for Hastings Borough Council.



# Hastings Borough Local Plan Review FB12 Feasibility Addendum

## Site Location

 FB12 boundary



**Figure 1.1**

Map Scale @ A4: 1:25,000

Surveyed by: -
Survey date: -
Drawn by: RAH
Checked by: RJH
Status: Final



## 2 Methods

### Desk study

- 2.1 The 2013 feasibility report included a desk study using records supplied by SxBRC from a 2 km search radius around the Policy FB12 site. As this data search had “timed out”, an identical data record request was made by AEL in June 2014.

### Field sampling

- 2.2 Automated static detectors were used to sample bat activity across the site in July 2014. The locations sampled are shown in **Figure 2.1**. Anabat Express detectors were placed in the centre of the FB12 site (currently a grassland, coded A1) and an adjacent wheat field (coded B) as a comparison. They were programmed to “wake up” half an hour before sunset, and to continue recording until half an hour after sunrise, running for five consecutive nights between 9 July 2014 and 13 July 2014. The detectors’ microphones were mounted on poles 2 m in height. If a wind turbine was to be developed at this site, its centroid is likely to be near to the location of detector A1.
- 2.3 In addition to these two detectors, four other Anabat Express detectors were placed out for a single night on 9 July 2014 (coded A2-A5). These were placed around the boundary of the FB12 site, including the boundary with the Combe Haven SSSI to the south. The purpose of these detectors was to obtain quickly a comparative sample of bat activity levels away from the centre of the site.
- 2.1 Calls were subsequently analysed in Analook, and a contact registration was defined as being presence of species/genus per maximum 15 s file.
- 2.2 The data recorded by Anabat Express detectors represent recorded passes by bats, and not the number of bats. A series of calls may be recorded from a single bat whose foraging crosses the receiver on multiple occasions. Also, automatic detectors may under-record the calls from quieter bats, such as brown long-eareds. These limitations need to be understood when interpreting the data.

### Weather data

- 2.3 The Anabat Express detectors recorded night time air temperatures every 5 minutes during their active recording periods.
- 2.4 Summary meteorological data were obtained from online data sources<sup>2</sup>.

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<sup>2</sup> <http://www.accuweather.com/en/gb/hastings/tn34-1/july-weather/327941?monyr=7/1/2014&view=table>



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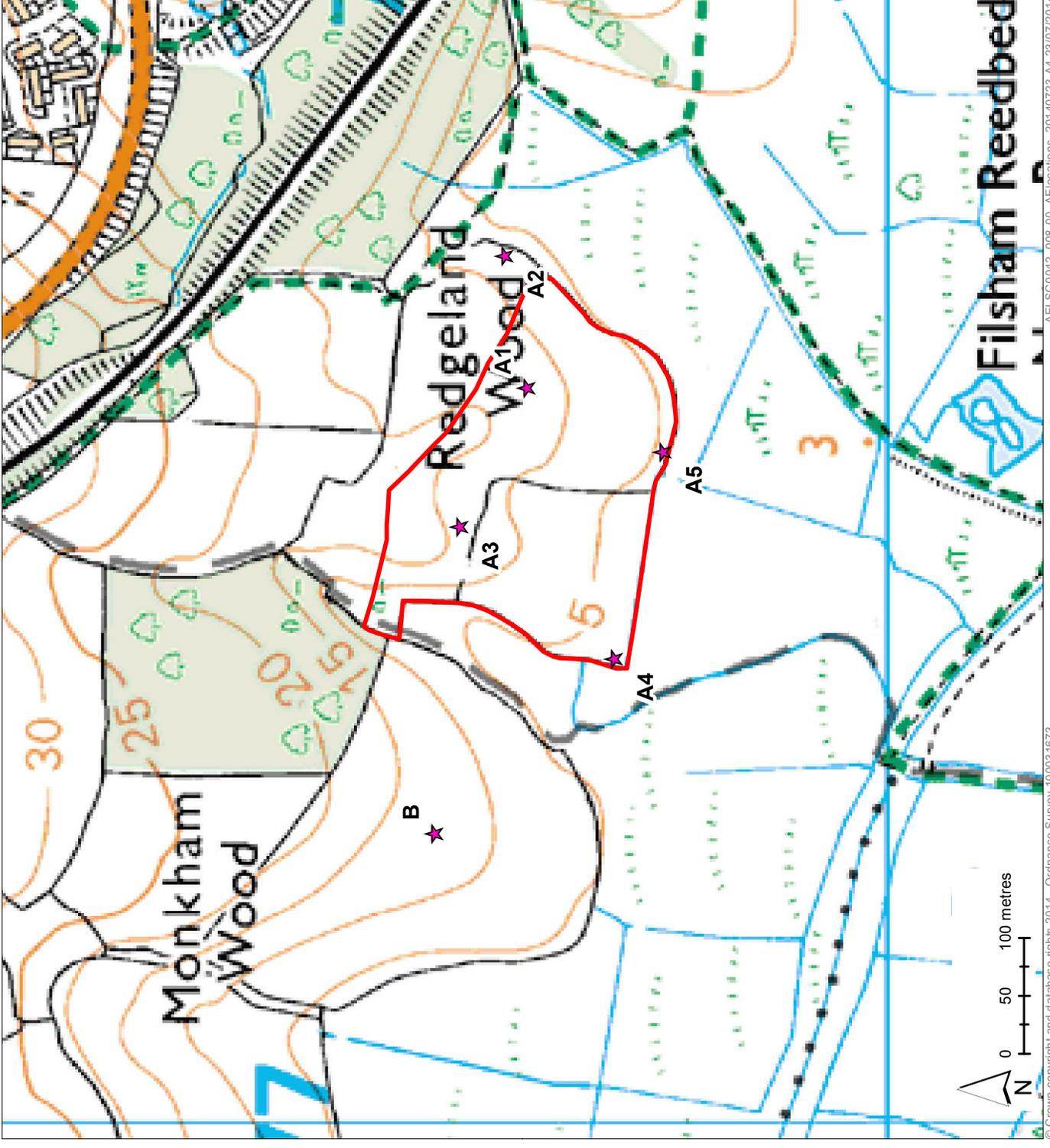
**Anabat Express Locations**

- FB12 boundary
- ★ detector location

**Figure 2.1**

**Map Scale @ A4: 1:5,000**

Surveyed by: AEL
Survey date: July 2014
Drawn by: RAH
Checked by: DP
Status: Final



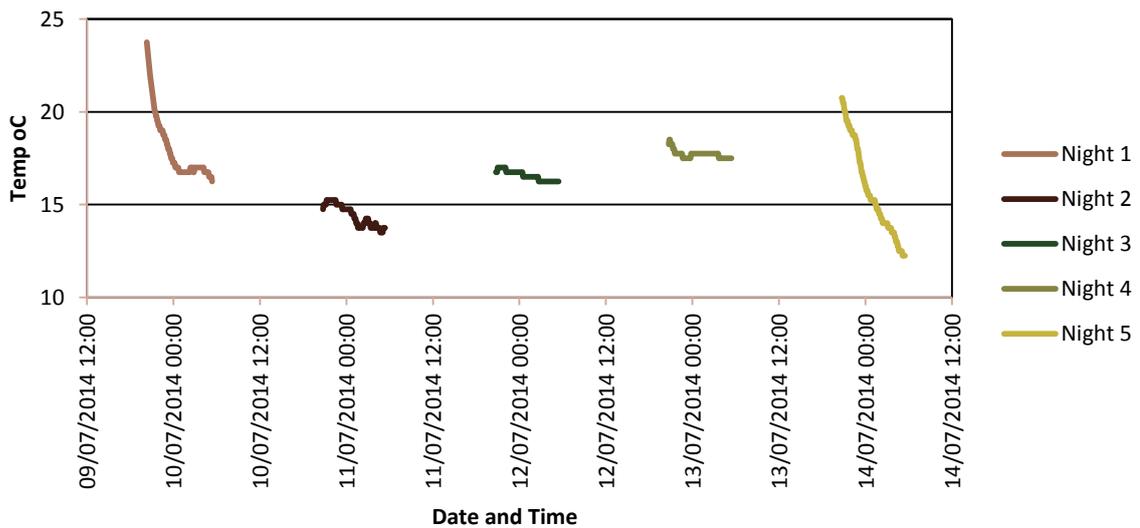
**Filsham Reedbed**

# 3 Results

## Weather

- 3.1 Online meteorological data report 2 mm of rain as having fallen on 11 July 2014 and 13 July 2014. No specific times for this precipitation were available. No wind speed data were available.
- 3.2 The night time temperature trends are summarised in **Figure 3.2** below. Overall, Night 2 (11-12 July 2014) was the coolest night, with an average temperature of 14.44 °C and a minimum of 13.75 °C. Nights 1 and 5 were generally the warmest nights, although by dawn on Night 5 (the morning of 14 July 2014), temperatures had fallen to 12.25 °C.

**Figure 3.1: Night time temperature data 9 – 14 July 2014.**



**Table 3.1: Summary of night time temperature data 9 – 14 July 2014.**

Temperature (oC)	Night 1 09/07/2014	Night 2 10/07/2014	Night 3 11/07/2014	Night 4 12/07/2014	Night 5 13/07/2014
Average	17.78	14.44	16.59	17.75	15.63
Maximum	23.75	16.75	18.50	20.75	20.50
Minimum	14.75	13.50	16.25	17.50	12.25



## Continuous recording for 5 nights

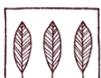
- 3.3 A summary of the five recording nights' data at locations A1 and B is shown in **Figure 3.3** and **Tables 3.2-3.3**.
- 3.4 **Table 3.2** shows that there was great variation in the number of bat passes recorded over the five sampling nights. This was attributable to the weather, with significantly less bat activity occurring on wet/windy nights (notably 9 and 11 July 2014). The purpose of sampling over a number of nights is to increase the probably that these data extremes, as well as more average conditions, are caught.
- 3.5 **Table 3.3** and **Figure 3.3** show that at least six different species of bat were recorded at locations A1 and B, but there was no significant difference between the total number of bat passes recorded in these two field-centre locations. Common pipistrelle was the most frequently recorded species in both locations.
- 3.6 There was a relatively high average pass rate for noctule bats at location A1. The maximum number of noctule passes (66) was recorded here on the night of 12 July 2014. In comparison, a maximum of 13 passes was recorded at location B on that night.

**Table 3.2: Total number of passes per night at locations A1 and B.**

Night start date	Number of passes recorded	
	A1	B
09 July 2014	6	8
10 July 2014	10	2
11 July 2014	1	5
12 July 2014	246	229
13 July 2014	42	32
Total	305	276

**Table 3.3: Summary of average number of passes per night at locations A1 and B, by species.**

Species	Passes per night	
	A1	B
common pipistrelle	37.6	42.4
soprano pipistrelle	5.2	6.2
pipistrelle sp.	0	0.2
<i>Myotis</i> sp.	1.0	1.0
noctule	16.2	4.4
<i>Nyctalus</i> sp.	0.2	0.2
serotine	0.6	0.6
barbastelle	0.2	0.2
Overall average passes per night	61.0	55.2



## Supplementary single night recording

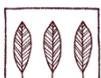
- 3.7 A summary of the single recording nights' data is shown in **Figure 3.4** and **Table 3.3**.
- 3.8 **Table 3.4** and **Figure 3.4** both show that, as at locations A1 and B, a range of bat species was recorded on the night of 9 July 2014 at locations A2-A5. The most common species passing the detectors was common pipistrelle. Location A2 recorded significantly more activity than the other detectors albeit from a more limited suite of species.

## Timings of passes

- 3.9 A summary of the first and last pass timing data is provided in **Table 3.5**. The earliest and latest species recorded on the site, a proxy measure for possible proximity to a roost site, was noctule bat, consistently being recorded up to 30 minutes after sunset, and 30 minutes before sunrise. Indeed, a noctule pass was recorded at dawn itself.
- 3.10 Common pipistrelle bats were also recorded relatively soon after sunset. All other species had an average first or last call of over an hour either after sunset or before sunrise. However, soprano pipistrelles and serotines were recorded in the hour immediately after sunset.

**Table 3.4: Summary of bat passes recorded at locations A2-A5 on 9 July 2014.**

Species	Passes recorded on 9 July 2014				
	A2	A3	A4	A5	Total
common pipistrelle	130	7	25	2	164
soprano pipistrelle	3	2	0	5	10
pipistrelle sp.	0	0	7	0	7
<i>Myotis</i> sp.	0	2	1	1	4
noctule	0	0	1	0	1
serotine	0	0	1	0	1
brown long-eared	0	0	0	1	1
total	133	11	35	9	188
number of species recorded	2	3	5	4	7



**Table 3.5: Summary of first and last pass timing data by species.**

Species	First call hours after sunset			Last call hours before sunrise		
	Average	Minimum	Maximum	Average	Minimum	Maximum
Common pipistrelle	00:53:04	00:32:21	01:12:26	01:47:04	00:33:49	04:05:52
Soprano pipistrelle	01:10:26	00:46:11	02:04:51	02:12:46	01:41:00	03:14:05
Barbastelle	02:04:34	01:18:24	02:50:45	04:56:15	04:56:15	04:56:15
Brown long-eared	03:28:40	03:28:40	03:28:40	04:09:20	04:09:20	04:09:20
<i>Myotis</i> sp.	02:24:20	01:04:05	03:44:36	02:37:51	01:17:45	04:02:24
Noctule	00:30:13	00:19:10	01:06:56	03:40:25	00:00:00	00:50:08
<i>Nyctalus</i> sp.	00:44:42	00:44:42	00:44:42	-	-	-
Pipistrelle sp.	02:19:30	02:19:30	02:19:30	-	-	-
Serotine	01:09:45	00:48:37	01:49:46	-	-	-

## Assessment and discussion

### Value of the site for bats

- 3.11 Using the criteria given in Wray *et al.* (2010)<sup>3</sup>, the bat activity data collected in July 2014 suggests that the FB12 site is of County to Regional importance for foraging and commuting bats. This is because it appears to provide foraging and/or commuting habitat for a moderate number of bats of common and rarer bat species, with roost sites potentially nearby, and proximity to well-grown hedgerows connecting woodland blocks within an area of mixed agriculture, pasture and wetlands area.

### Comparative bat collision risk at Upper Wilting Farm

- 3.12 Despite the scarcity of empirical data, it is bat species are considered to differ in their relative collision risk due to variations in their flight behaviour and/or use of the landscape when in flight. In addition, the relative threat that collisions with turbines may impact on populations of bats also varies by species, according primarily to rarity. Natural England has provided guidance regarding these two factors, which is summarised in **Table 3.6**. The application of these criteria to the species recorded at Upper Wilting Farm is discussed below.

<sup>3</sup> Wray, S., Wells, D., Long, E. and Mitchell-Jones, T (2010) Valuing bats in Ecological Impact Assessment. *In Practice*, December 2010.



**Table 3.6: Collision risk and population threats for bat species (adapted from NE, 2014<sup>4</sup>).**

Risk rating		Species at risk of collision with wind turbines		
		Low	Medium	High
Risk of threat to populations	Low	Myotis species Long-eared bats Horseshoe bats	Common pipistrelle Soprano pipistrelle	-
	Medium	-	Serotine Barbastelle	-
	High	-	-	Noctule Leisler's Nathusius' pipistrelle

**Pipistrelle species *Pipistrellus pipistrellus* and *Pipistrellus pygmaeus***

- 3.13 Common pipistrelle *Pipistrellus pipistrellus* is likely to be common and widespread throughout the area around the FB12 site, being a species which is found foraging in a wide variety of habitats, including gardens, farmland, parkland, deciduous woodland rides/edges, rivers, streams and lakes. It is a species that typically tends to avoid foraging in very open areas, and at Upper Wilting Farm its highest numbers were associated with the northern boundary. However, it was also recorded in the centre of the fields.
- 3.14 Soprano pipistrelle *Pipistrellus pygmaeus* tends to be more specific in its foraging habitat than the common pipistrelle, preferring areas with bodies of water (rivers, canals, lakes and ponds and associated wetland vegetation), as well as broad-leaved and mixed woodland edges. It was recorded in low numbers at Upper Wilting Farm, with the greatest number of passes per night recorded on the boundary with the Combe Haven SSSI (a wetland) as well as in the centre of the fields.
- 3.15 **Table 3.6** shows that while pipistrelle bats have a medium level of turbine collision risk, due to the relatively healthy population status, wind turbine developments are considered to be of low risk to their long term survival. Based on the limited sampling undertaken for this addendum, it would appear that pipistrelle bats are not of concern in the context of a wind turbine proposal at the FB12 site.

**Myotis species**

- 3.16 *Myotis* bats, covering a number of species whose calls are difficult to differentiate, are widespread in their occurrence throughout Europe. Different species have different habitat preferences for foraging, and there are a number of species which these calls could theoretically be attributed to. The low number of passes from *Myotis* species, coupled with the fact that they are a species with a low collision risk and a low level of threat to their populations (see **Table 3.6**), indicates that it is unlikely that *Myotis* species of bat will be a concern in the context of a wind turbine proposal at the FB12 site.

<sup>4</sup> Natural England (2014) Bats and Onshore Wind Turbines: Interim Guidance. Natural England Technical Information Note TIN051. Third Edition, 11 March 2014.



### ***Serotine***

- 3.17 A small number of serotine *Eptesicus serotinus* passes were recorded, primarily within the field centres. Although typically a woodland edge, hedgerow and watercourse forager, it does also feed over parkland and pasture. It typically emerges from its roost site in the early evening (15 minutes after sunset), and therefore the recorded first pass timings are not indicative of a roost location particularly close to the FB12 site.
- 3.18 Serotine bats are considered to have a medium level of collision risk, with this representing a medium level of threat to its population status. However, the relative low numbers recorded during this sampling indicates that serotine bats are unlikely to be of concern in the context of a wind turbine proposal at the FB12 site.

### ***Barbastelle***

- 3.19 A couple of barbastelle *Barbastelle barbastellus* passes were recorded in the field centre locations. They are a species which prefers wooded countryside and tends to hunt over wooded river valleys, often up in the tree canopy. However, it will also occasionally forage over meadows and more open countryside. It is unclear as to whether the barbastelle calls recorded were from foraging or commuting bats.
- 3.20 Barbastelle bats typically emerge from their roosts 20-60 minutes after sunset. Like serotine bats, it is considered to have a medium level of collision risk, with this representing a medium level of threat to its population status as it is a relatively rare species. However, given the low numbers recorded at Upper Wilting Farm, and the timings of the first passes, it is considered unlikely that barbastelle bats will be of concern in the context of a wind turbine proposal at the FB12 site.

### ***Brown long-eared bat Plecotus auritus***

- 3.21 A single pass of a brown long-eared bat was recorded at location A5. The historical data provided by SxBRC show a number of known brown long-eared roost sites to the north-west of the FB12 site (see CBA, 2013).
- 3.22 Brown long-eared bats are generally thought to forage within 1.5 km of a roost and use a series of foraging sites, between which they move along flyways such as hedgerows or treelines. They select deciduous woodland as preferred foraging habitat, but are also known to feed in mixed woodland and on the edges of coniferous plantations.
- 3.23 Like *Myotis* species, brown long-eared bats are a species with a low collision risk and a low level of threat to their populations (see **Table 3.6**). It is considered unlikely that this species of bat will be of concern in the context of a wind turbine proposal at the FB12 site.

### ***Nyctalus species***

- 3.24 A significant number of noctule *Nyctalus noctula* bat passes were recorded, in particular at location A1. A handful of other *Nyctalus* passes which shared characteristics of both noctule and Leisler's *Nyctalus leisleri* were recorded and were hence classified only to genus.



- 3.25 Noctule and Leisler's bats are early emerging species, typically leaving a roost between 0-30 minutes after sunset and sometimes even earlier. They are able to fly long distances (up to 20 km) very quickly after emerging. The first and last pass timing data indicate that *Nyctalus* bats are often the first and last species to be recorded on the site within a recording night, and the timings are suggestive of a roost site relatively nearby. The *Nyctalus* passes show a characteristic early evening peak, and subsequently a pre-dawn peak suggesting that these bats are commuting over the site to forage elsewhere, and returning back over the site at the end of the night. It is possible however that the large number of passes recorded could be partly attributed to commuting bats opportunistically foraging over the site when circumstances are favourable for doing so. This is typical *Nyctalus* behaviour.
- 3.26 Unlike most of the other UK bat species, *Nyctalus* species (including noctule and Leisler's bats) fly at height and as a result are known to have been killed by wind turbines (Jones *et al.* 2009<sup>5</sup> and Rodrigues *et al.* 2008<sup>6</sup>), with 78 out of 1502 reported bat casualties from European windfarms reported in the available literature being positively identified as from this genus. For this reason, these species have a high risk of collision with wind turbines, and also a subsequent high threat to their population status (see **Table 3.6**).
- 3.27 Given the short sampling period, and the relatively high number of *Nyctalus* passes per night, it is considered likely that *Nyctalus* species will need to be investigated in detail with regards to their collision risk at Upper Wilting Farm.

## Recommendations

### Further survey

- 3.28 Detailed bat surveys would be required to investigate further the distribution and species composition of bat activity on and near the FB12 site, including at least bi-monthly (and preferably monthly) recording between May and September, and at-height measurements which can be correlated with wind speed data. These data would subsequently inform development design and options for operational-phase mitigation which would enable potential bat constraints at FB12 to be dealt with effectively.

### Development design

- 3.29 In terms of managing bat collision risk on a wind turbine site, strategic positioning of turbines is the typical primary option, siting turbines at least 50 m + rotor sweep away from the boundary features which commuting and foraging bats preferentially use. However, in this instance, the preliminary data suggest that the key species in relation to the Upper Wilting Farm site is noctule bat. This species is a high and direct flying species that is less reliant on boundary features for commuting and foraging than some other bat species, and therefore this design principle alone may not be sufficient to reduce the collision risk to an acceptable level. An additional consideration is the limited hectareage available within the

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<sup>5</sup> Jones, G., Cooper-Bohannon, R., Barlow, K. and Parsons, K. (2009) *Scoping and Method Development Report: Determining the potential ecological impact of wind turbines on bat populations in Britain*. University of Bristol and Bat Conservation Trust.

<sup>6</sup> Rodrigues L., Bach L., Duborg-Savag M-J, Goodwin J. and Harbusch C. (2008) *Guidelines for Consideration of Bats in Wind Farm Projects*. EUROBATs Publication Series No. 3 (English version). UNEP/EUROBATs Secretariat, Bonn, Germany.



FB12 site. The alternative option is for selective, temporal shut down of turbines (e.g. night time hours between May and September at certain wind speeds).

### **Policy FB12 amendments**

- 3.30 In order to ensure that these recommendations are incorporated in any proposals put forward for the FB12 site, it is recommended that the current wording of Policy FB12 is amended. The amendments would solely apply to the (ii) section of the policy and should read as:

*[The Council expects development proposals for this site to:]*

*(ii) Include an Ecological and Ornithological Impact Assessment of the proposals, including specific reference to the presence of:*

*a. The Combe Haven Valley Site of Special Scientific Interest (SSSI)*

*b. Combe Valley Countryside Park*

*c. Ancient Woodlands*

*d. Local Wildlife Sites*

*All as shown on the policies map, and:*

*e. Protected species*

*f. Ornithological interests.*

*And, incorporate an Ecological Constraints and Opportunities Plan, if appropriate.*



# Hastings Borough Local Plan Review FB12 Feasibility Addendum

## Anabat Express Results: A1 & B

 FB12 boundary

**Species:**

-  common pipistrelle
-  soprano pipistrelle
-  pipistrelle sp.
-  Myotis sp.
-  noctule
-  Nyctalus sp.
-  serotine
-  barbastelle
-  brown long-eared

 Pie chart radius is proportional to overall number of passes per night (ppn). The disc indicates the diameter represented by 22 ppn.

**Figure 3.2**

Map Scale @ A4: 1:5,000

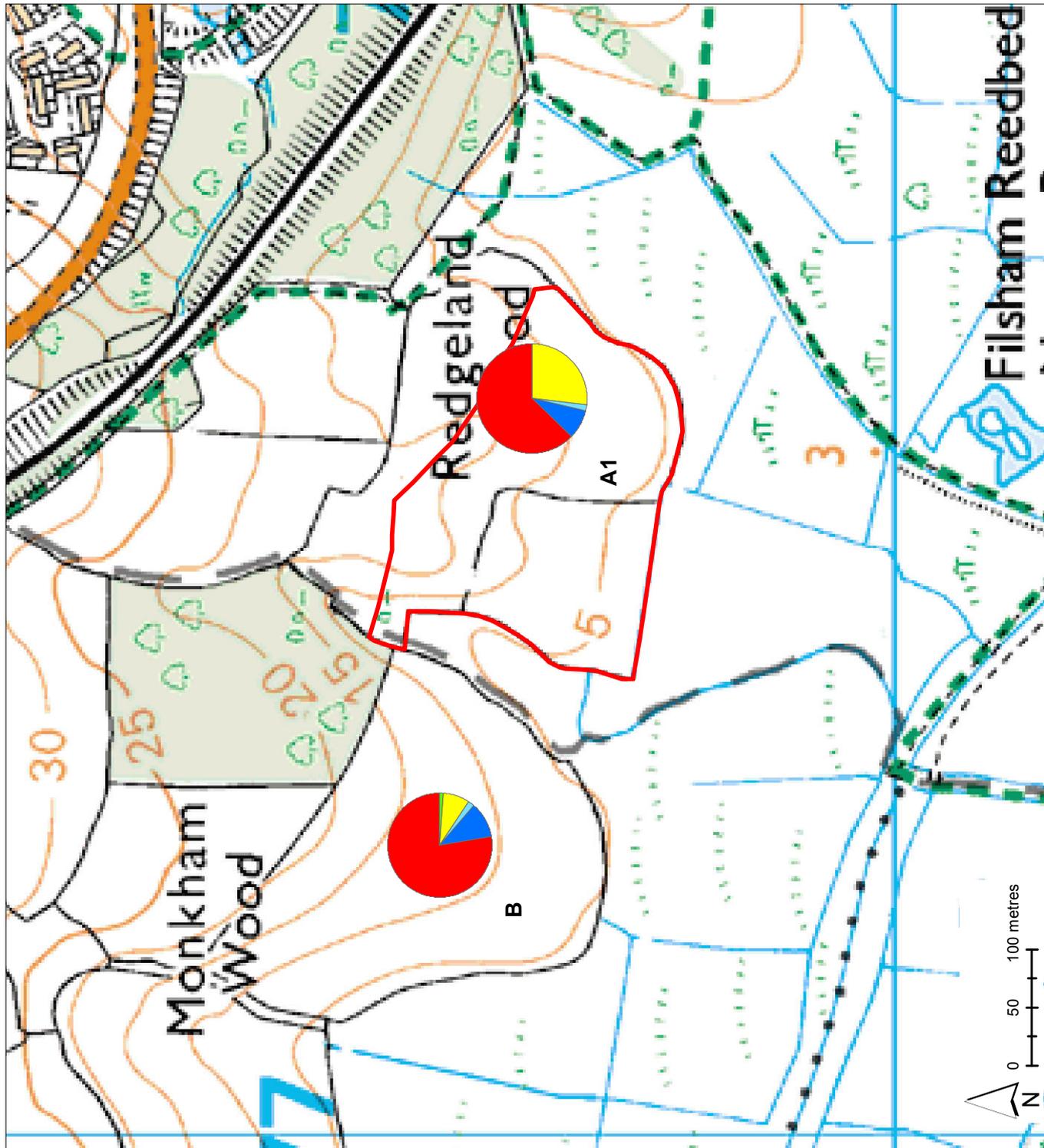
Surveyed by: AEL

Survey date: July 2014

Drawn by: RAH

Checked by: DP

Status: Final



# Hastings Borough Local Plan Review FB12 Feasibility Addendum

## Anabat Express Results: A2-A5

-  FB12 boundary
- Species:**
  -  common pipistrelle
  -  soprano pipistrelle
  -  pipistrelle sp.
  -  Myotis sp.
  -  noctule
  -  Nyctalus sp.
  -  serotine
  -  barbastelle
  -  brown long-eared

Pie chart radius is proportional to overall number of passes per night (ppn). The disc indicates the diameter represented by 64 ppn.



**Figure 3.3**

Map Scale @ A4: 1:5,000

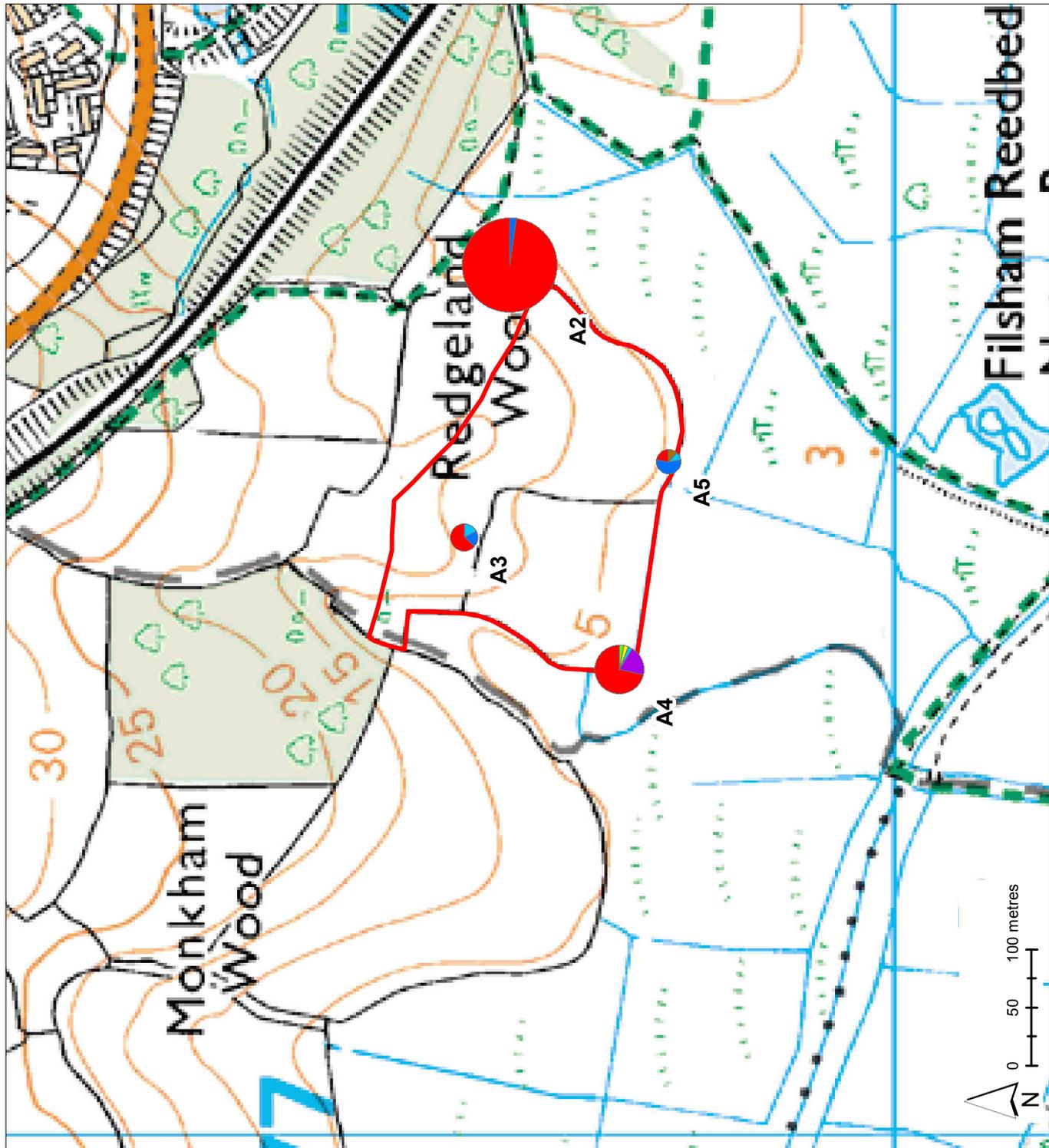
Surveyed by: AEL

Survey date: July 2014

Drawn by: RAH

Checked by: DP

Status: Final



**Filsham Reedbed**

## 4 Conclusions

- 4.1 The snapshot bat sampling undertaken in July 2014 and reported here indicates that a number of bat species are using the FB12 site for foraging, and there may be bat roosts in relative close proximity to the site (most likely of common pipistrelle and/or noctule bat species). The most notable result was a comparatively high number of passes of noctule bat, which is a species with a high risk of collision with wind turbines due to its large size and high, direct flight characteristics.
- 4.2 Recommendations have been made as to the likely survey requirements for full investigation of bat usage of Upper Wilting Farm, which will be needed to inform proposals for the construction and operation of a wind turbine on the site. Detailed data will be used to inform an Ecological Impact Assessment of the proposals which will determine how these potential ecological constraints could be managed. To this end, recommendations have also been made regarding the rewording of Policy FB12 to provide reassurance that these potential constraints will be dealt with in full if the allocation at Upper Wilting Farm is taken forward for development.



