

14/3022

Land off Marley
Road, Exmouth

Ecological Appraisal

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**The Environmental
Dimension
Partnership (EDP)**

On behalf of:
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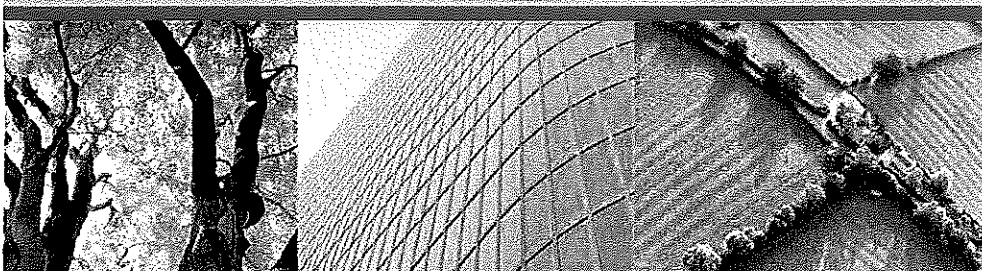
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ENVIRONMENTAL PLANNING, DESIGN AND MANAGEMENT SERVICES

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THE
ENVIRONMENTAL
DIMENSION
PARTNERSHIP

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For EDP use

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Distribution

- 3.15 The hedgerows and woodland edge in the northern section of the Application Site and the parkland habitat making up the south-western corner of the Application Site support the most abundant and diverse assemblage of birds, including a small number of migrant warblers – at least one confirmed breeding pair of blackcap were recorded at the woodland edge in the north of the Application Site.
- 3.16 The parkland was found to support a number of potential breeding pairs of tit species, as well as wren, great spotted woodpecker and wood pigeon. The grassland fields were found to only support a small number of foraging common resident passerines, there is no suitable breeding habitat for this assemblage of birds within the Application Site.

Conservation Concern Species

- 3.17 A number of species of conservation importance, in terms of being listed as UK BAP Priority Species and/or having been assessed as Red/Amber Listed species of conservation concern, were identified during the surveys. However, only the red-listed song thrush (1-2 pairs) and amber-listed dunnoek (1-2 pairs) were recorded as possibly breeding within the Application Site itself in low numbers. Both of these species are considered to be relatively common in Devon, and none of the recordings are considered to be significant in the local context.
- 3.18 No amber list, red list or UK BAP species were confirmed as breeding on the Application Site. While not confirmed to be breeding on site, a number of conservation concern species were recorded occurring within the site, including willow tit, bullfinch, stock dove, house sparrow, herring gull, house martin and swallow.

Overall Evaluation

- 3.19 Overall, the surveys confirmed that the Application Site supports a typical assemblage of breeding birds that is limited in diversity and abundance, reflecting the range and size of habitats that are present within it. The species recorded at the site are typical of an urban-edge grassland and woodland site in lowland Britain, being biased towards common and widespread generalist species with a few more notable species occurring occasionally. The breeding bird assemblage on the Application Site is therefore considered to be of no more than local importance.

Bats

- 3.20 DBRC returned ten records of four different bat species within the 2km search area of the site; most recent records were in 2005 of a common pipistrelle approximately 690m south west of the Application Site and a brown long-eared bat approximately 960m south west (see **Appendix EDP 9**). Additionally, within the 4km search radius for Annex II species, DBRC and Devon Bat Group returned a number of records of bat roosts. These records comprise lesser horseshoe roosts located approximately 500m south east

of the site recorded in 1994, 1km south east in 2005, 1.2km south west in 2011 and a greater and lesser horseshoe roost 1.6km north east in 2003.

Bat roosting

- 3.21 During the ground level visual assessment of mature trees for roosting bats in August 2014, no bats or evidence of bats was found. However, a total of 31 trees/tree groups were identified as offering potential to support roosting bats, with 12 identified as high potential, 11 as medium potential and eight as low potential (see **Appendix EDP 4** for details). These trees are generally located in the southern half of the site, within the parkland with a few along the site boundaries.
- 3.22 Of the 31 trees described above, 18 are proposed for removal to facilitate the development or for health and safety reasons. These 18 trees were therefore subject to an additional aerial tree climbing inspection during October 2014 with the aim of investigating the presence or absence of bats within these trees. No bats or evidence of bats was seen during the aerial inspection of the potential roosting features and 13 of the trees had their bat roost potential category downgraded (see **Appendix EDP 4** for details).

Bat Foraging/Commuting Activity

- 3.23 Detailed results from the four dusk transect surveys undertaken in 2014 are provided in **Appendix EDP 4**, and the distribution of bat activity recorded around the Application Site during the surveys is illustrated on **Plan EDP 3**. In summary, low-moderate levels of bat activity were recorded across the Application Site.
- 3.24 The following common and widespread species of bat were recorded during the transect surveys: common pipistrelle, soprano pipistrelle, noctule, serotine, Leisler's bat, long-eared bat and species of myotis bat, with common pipistrelle accounting for the largest proportion of recordings (45%). A rarer bat species, the barbastelle, was also recorded during the transect surveys (five recordings). In terms of distribution within the Application Site, activity was highest (relatively speaking) in the southern field of the Application Site near to the parkland and adjacent woodland parcels.
- 3.25 Detailed results from the automated detector surveys undertaken in 2014 are provided in **Appendix EDP 4**. To summarise, the vast majority of bat activity recorded by the Anabats was of common and soprano pipistrelles (72% and 17% respectively) and the range and proportion of species was broadly similar to that recorded during the manual surveys. However, a small number of calls by lesser horseshoe (four calls in June at position 2 and seven calls in September at position 4), greater horseshoe (two calls in July at position 4 and one call in September at position 6) and Nathusius' pipistrelle (four calls at position 4 and ten calls at position 5 during September) were detected by this method which were not recorded during the transect surveys. Notably, relatively large numbers of barbastelle calls were recorded at position 2 during both June

(30 recordings) and August (30 recordings), and at position 4 (30 recordings) and position 5 (103 recordings) during the September sampling period.

- 3.26 Based on the findings summarised above, and owing to the usage of the site by Annex II-listed bats (lesser horseshoe, greater horseshoe and barbastelle) with a relatively high amount of barbastelle activity recorded across the season, the bat population present within the Application Site is considered to be of district level value.

Dormouse

- 3.27 A single record for dormouse was received from DBRC within 1km of the site; this record is located approximately 300m north east of the Application Site boundary and is dated from 2007. The site is bounded by a number of woodland parcels and is well connected through these parcels and suitable hedgerows/tree lines to woodland blocks in the wider landscape. Such habitats are considered to have moderate potential to support dormouse.
- 3.28 The detailed dormouse surveys undertaken across the Application Site throughout 2014 found a single dormouse within its nest during the final survey visit (see **Appendix EDP 5**). This was located along the northern boundary of the woodland parcel between the two fields of the Application Site (see **Plan EDP 4**). These results suggest that a small or widely dispersed population of dormice is present in the area, which is of local value. No evidence of breeding was recorded during the survey and the inference is that dormice occasionally disperse throughout this woodland parcel and possibly through other connected habitat corridors within the Application Site.

Badger

- 3.29 Several records of badger within 1km of the site were returned by DBRC. The most recent records are from 2005 located approximately 800m south west of the site.
- 3.30 The detailed walkover survey undertaken during June 2014 covered the Application Site and accessible woodland adjacent to its boundaries (namely the parcel of woodland in between the two fields of the Application Site). The survey found a small, disused badger sett within woodland approximately 20m outside of the Application Site boundary, and a small number of foraging signs on the Application Site boundary near to an adjacent woodland parcel.
- 3.31 This survey confirms the presence of badgers within and around the Application Site. However, no active setts are currently present, and both foraging and sett building opportunities are generally restricted to the field boundaries and parkland. The badger population present is of low ecological significance, however requires consideration in relation to their legal protection.

Appendix EDP 4

Bat Surveys

Methodology

- A4.1 During the Extended Phase 1 Survey, areas of woodland, semi-improved grassland, parkland and hedgerows were identified as having the potential to support foraging and commuting bats. Furthermore, a number of mature trees present within or immediately adjacent to the Application Site boundary were considered to have the potential to support tree roosting bat species.
- A4.2 The following surveys for bats were therefore undertaken, with reference to national best practice guidelines¹⁰:
1. Assessment of mature trees for bat roosting potential, comprising:
 - (a) Visual assessment; and
 - (b) Aerial inspection.
 2. Bat foraging/commuting activity, comprising:
 - (a) Manual transect surveys; and
 - (b) Automated detector surveys.

Assessment of Mature Trees for Bat Roosting Potential

Visual Assessment of Trees

- A4.3 A visual assessment of all suitable trees on site for the presence of, or potential to support bats, was undertaken by a Natural England bat licensed ecologist in accordance with best practice guidelines. The visual assessment was undertaken on 12 August 2014. The trees were searched as thoroughly as possible from ground level, with all elevations covered where accessibility allowed.
- A4.4 Suitable features for roosting bats include:
- Loss/peeling/fissured bark;
 - Natural holes e.g. rot holes and holes from fallen limbs;
 - Woodpecker holes;

¹⁰ Bat Conservation Trust (2007). *Bat Surveys: Good Practice Guidelines*. Bat Conservation Trust, London

- Cracks/splits or hollow tree trunks/limbs; and
- Thick-stemmed ivy.

A4.5 Signs of roosting bats include:

- Bat/s roosting in-situ;
- Bat droppings within or beneath a feature (hole or split);
- Staining around or beneath a feature;
- Oily marks (staining) around roost access points;
- Audible squeaking from the roost;
- Large/regularly used roosts or regularly used sites may produce an odour; and
- Flies around the roost, attracted by the smell of guano.

A4.6 Based upon the results of the visual assessment and features/evidence identified as above, the following ratings for trees were used during the assessment:

- Known or confirmed roost - European Protected Species (EPS) licence required for works to tree to be completed lawfully;
- High potential (Category 1*) - Multiple highly suitable features capable of supporting larger roosts;
- Medium potential (Category 1) - Definite bat roosting potential with fewer suitable features than Category 1*;
- Low potential (Category 2) - No obvious potential, although the tree is of an age and size where suitable features may be found, or the tree supports features which may have limited potential for roosting bats; and
- No potential (Category 3) - No potential to support roosting bats.

Limitations

A4.7 Visual assessments for roosting bats can be undertaken at any time of year and this assessment was not limited by seasonal or climatic factors.

A4.8 It should be noted that this type of assessment is based on features visible from the ground level and is not considered to be a definitive bat roosting survey. Additional

survey work may therefore be required to establish if any bats are roosting within the trees and if present, their species, type of roost supported, and size of the roost, should any trees of sufficient potential be subject to felling/tree surgery. If trees are found to support bat roosts during pre-commencement investigations, such works would be subject to a European Protected Species (EPS) licence to commence lawfully.

Aerial Inspection of Trees

A4.9 During the ground based bat roosting assessment undertaken on 12 August 2014, a total of 31 trees with potential to support roosting bats were identified. As the removal of 18 of these trees is potentially required to facilitate the development, these 18 trees were subject to an aerial tree inspection for bats on 1 and 2 September 2014 with the aim of investigating the presence/absence of bats within these trees.

A4.10 The trees subject to survey are listed in **Table EDP A4.1**, which details the tree species, age, class and bat roosting potential (based on the ground based assessment). The purpose of the aerial inspections was to investigate the likelihood that the subject trees were used by roosting bats, and if evidence of bats is present, to gather sufficient data to allow an assessment of the roost to be made to inform recommendations in relation to the proposed development.

Table EDP A4.1: Details of the trees subject to aerial climbing inspection.

Tree No.	Tree Species	Age Class	Bat Roosting Potential (based on ground assessment)
T1 (1)	Common oak	Semi-mature	Medium
T1 (2)	Common oak	Semi-mature	Medium
T1 (3)	Common oak	Semi-mature	Medium
T1 (4)	Common oak	Semi-mature	Medium
T1 (5)	Common oak	Semi-mature	Medium
T1 (6)	Common oak	Semi-mature	Medium
T1 (7)	Common oak	Semi-mature	Medium
T1 (8)	Common oak	Semi-mature	Medium
T1 (9)	Common oak	Semi-mature	Medium
T2	Turkey oak	Mature	Low
T3	Sycamore	Semi-mature	Low
T6	Holm oak	Mature	Medium
T23	Sycamore	Semi-mature	Medium
T25	Lucombe oak	Mature	Medium
T26	Lucombe oak	Mature	Low
T27	Common oak	Mature	Medium
T47	Common oak	Dead	High
T48	Lucombe oak	Mature	High

A4.11 The tree climbing survey was undertaken by a suitably qualified bat-licensed ecologist and assistant. The survey employed the use of tree climbing equipment and ladders, in

order to access potential features, torches, endoscope (RIDGID Seesnake) and a camera to inspect potential roosting features.

- A4.12 Details of each potential roosting feature were recorded including type of feature, location within the tree, height and orientation of feature, notes relating the feature including any evidence of bats and the potential of each feature to support roosting bats (confirmed roost, high, moderate, low or negligible potential).
- A4.13 Where there are restrictions on inspection of individual features these are identified, for example if a feature cannot be fully inspected by means of aerial inspection due to its size or difficulty using the endoscope, recommendations are made accordingly. Whilst every effort is made to locate and inspect all potential roosting features on trees, it is possible that some features may be missed if not readily visible from the ground, or within the tree.

Limitations

- A4.14 Tree numbers T1 (6) and T1 (9) are located adjacent to power lines that run within 2.5m of the stem of the tree. Climbing the trees would therefore potentially result in coming into contact with the power lines. An aerial inspection of tree T1 (6) was carried out whilst within T1 (5) and from the ground. A ground inspection of tree T1 (9) was carried out.

Investigations of Bat Foraging/Commuting Activity

Manual Transect Surveys

- A4.15 Manual transect surveys were undertaken across the Application Site to identify areas of bat foraging activity and commuting routes used by bats during 2014. In accordance with best practice guidelines¹¹, surveys were spread over the course of the active bat season and completed within the optimal survey months of June to September inclusive.
- A4.16 Full details including the survey type, date, timing, and weather conditions during each of the transect surveys undertaken during 2014 is given in **Table EDP A4.2**. Weather conditions on each visit were optimal for bat surveys, being relatively warm with light to medium winds and no rain. The surveys are therefore not considered to be seasonally or climatically constrained.

¹¹ Hundt L (2012). *Bat Surveys: Good Practice Guidelines, 2nd Edition*, Bat Conservation Trust

Table EDP A4.2: Date, timing and weather conditions of bat activity transect surveys.

Survey date	Dusk/dawn	Survey time	Sunrise/sunset time	Weather conditions			
				Temp (°C)	Cloud (%)	Rain	Wind (Beaufort scale)
18/06/14	Dusk	21:27 - 00:42	21:42	15.5 - 17.5	0 - 20	Nil	0 - 1
16/07/14	Dusk	21:20 - 00:20	21:20	16.7 - 17.1	40 - 50	Nil	0 - 1
20/08/14	Dusk	20:19 - 23:26	20:25	8.1 - 11.5	0 - 10	Nil	0
17/09/14	Dusk	19:22 - 22:24	19:24	16.9 - 19.0	0 - 90	Nil	3 - 4

A4.17 Manual transect surveys were completed by two experienced bat surveyors across one transect survey route, with each surveyor starting in a different location. The transect route was designed to cover all woodland, trees, hedgerows and other potential foraging or commuting habitat within the Application Site as illustrated on **Plan EDP 2**. Transect routes were walked at a slow and steady pace with ten 'listening stops', lasting approximately five to six minutes each. All bats were recorded and their behaviour marked on survey maps in order to characterise the value of the site and its component habitats to foraging and commuting bats.

A4.18 Activity surveys were conducted using Wildlife Acoustics EM3 or EM3+ detectors. Observations of the time, location, and activity of all bats seen or heard were noted. Bats were identified on the basis of their characteristic echolocation calls, which were recorded and analysed using computer sonogram analysis (AnalookW and Batsound 4.03) to confirm species identification. Species of myotis bat and long-eared bat are difficult to tell apart solely from their echolocation calls and were therefore grouped as such.

Automatic Detector Surveys

A4.19 To supplement the bat transect survey data, bat activity within the Application Site was also sampled using static bat detectors that automatically trigger and record bat echolocation calls. This survey method was used during the months of June to September 2014 providing a total of four recording periods.

A4.20 Three Anabat SD2 Bat Detectors were deployed during each of the four sampling periods in six different locations over the Application Site (positions 1 to 3 used during June and August, positions 4 to 6 used during July and September), as shown on **Plan EDP 2**. The Anabats were fixed in secure locations, with an external microphone attached 1-2m above ground, and directed away from the tree to maximise detection sensitivity. **Table EDP A4.3** gives the sampling dates and location details for the Anabats deployed during the four recording periods. Minimum night time temperatures were recorded by weather data loggers attached to one of the Anabats.

Table EDP A4.3: Anabat sampling dates and location details.

Dates	Position	Adjacent/Nearby Habitat	Microphone			Min temp (°C)
			Ht (m)	Direction	Sensitivity	
18/06/14 - 24/06/14	1	Grassland and woodland edge	2	West	6.1	12.7
	2	Parkland	2	South west	6.5	
	3	Grassland	1	South west	6.5	
16/07/14 - 21/07/14	4	Grassland and woodland edge	1.5	North east	6	8.0
	5	Grassland and woodland edge	2	West	6	
	6	Hedgerow with trees	1.5	North east	6	
20/08/14 - 26/08/14	1	Grassland and woodland edge	1.5	North west	4	8.8
	2	Parkland	1.5	South west	6	
	3	Grassland	1.5	West	4.25	
17/09/14 - 24/09/14	4	Grassland and woodland edge	1	South west	6	8.7
	5	Grassland and woodland edge	1.5	East	6.75	
	6	Hedgerow with trees	1	North west	6	

A4.21 The echolocation calls recorded by the Anabats were filtered for noise files (i.e. sound files created when background noise triggers the anabat to record) and then specifically for each of the UK's bat species using Analook software filter function. The parameters for the noise filter are based on that proposed by Chris Corben and Kim Livengood¹² and are provided in **Table EDP A4.4**. All files passing the various filters were checked manually using sonogram analysis (AnalookW) in accordance with published parameters¹³ to confirm the species identification of each bat call.

Table EDP A4.4: Filtration values used by Analook software to remove noise files.

Filter	Smoothness	Frequency (Fc (kHz))		Duration (ms)	
		Min	Max	Min	Max
Noise filter	50	15	120	2	50

Limitations

A4.22 The identification of calls and species using Analook software is dependent upon the quality of the recording made which can be influenced by the following factors, which may limit levels of activity and species recorded:

¹² Taken from Making an Antinoise Filter presentation from 2010 Annual Bat Conference

¹³ Russ (2012). *British Bat Calls, a guide to species identification*. Pelagic Publishing, Exeter

- Weather conditions – rainfall and wind;
- Distance of bat from Anabat;
- Presence of obstructions through which the noise must pass i.e. trees; and
- Proximity of other noise sources such as roads.

A4.23 None of the automatic detector surveys completed during 2014 were constrained by unseasonably cold or wet conditions.

Results

Assessment of Mature Trees for Bat Roosting Potential

Visual Assessment of Trees

A4.24 During the visual assessment for roosting bats in August 2014, no bats or evidence of bats was found from ground level at the time of the assessment. However, a total of 31 trees/tree groups were identified as offering potential to support roosting bats, with 12 identified as high potential (Category 1*), 11 as medium potential (Category 1) and eight as low potential (Category 2). Details of the trees, together with their corresponding reference numbers from EDP's Arboricultural Assessment (report **T_EDP2392_04**), are provided in **Table EDP A4.5** below.

Table EDP A4.5: Results of tree assessment for roosting bats.

Tree No.	Species	Features Identified	Bat Roost Potential Category
T1	Common oak	Nine trees - various limb holes, rotten limb, gap at tear-out, low cavity, crack where trunk forks, some flaking bark and ivy.	Medium
T2	Turkey oak	Two limb holes, crack and hollow trunk; appears limited however.	Low
T3	Sycamore	Some flaking bark.	Low
G4	Common alder, common oak, hybrid black poplar	-	Negligible
T5	Common oak	Tear-out with cavity above and below, depressions on trunk.	Medium
T6	Holm oak	Limb hole, tear-out at base, splits on trunk, gaps in bark.	Medium
T7	Lucombe oak	Limb hole, three tear-outs and rotten limb.	High
T8	Lucombe oak	Two limb holes and tear-out; appears limited.	Low
G9	Common oak, ash, wych elm	-	Negligible
T10	Common oak	Tear-out, limb holes and splits in dead limb.	High
T11	Turkey oak	Two limb holes, large cavity, open cavity, split on falling limb, gaps in bark.	High

Tree No.	Species	Features Identified	Bat Roost Potential Category
T12	Lucombe oak	Two limb holes and rotten limbs.	Low
T13	Lucombe oak	Limb hole, rotten limbs and hole on trunk; however appears limited.	Low
G14	Lucombe oak, turkey oak	Three trees - various limb holes (some large), tear-outs, dead limb, limb wound, hole at tree wound.	High
G15	Turkey oak	Four trees - limb holes (some with cavities), cavities facing upwards, depressions in trunk, dead limbs with splits/flaking bark, crack on trunk and flaking bark elsewhere.	High
G16	Ash, beech, Monterey cypress, hybrid black poplar, wych elm	-	Negligible
T17	Hybrid black poplar	-	Negligible
G18	Turkey oak, Lucombe oak	Two trees - various limb holes, large split on fork of trunk, dead limbs, flaking bark (including on dead limbs).	High
T19	Lucombe oak	Limb holes and tear-outs.	Medium
T20	Turkey oak	Limb hole, tear-out and splits and hole on trunk.	High
T21	Turkey oak	Approximately five open cavities at base of limbs and splits on trunk.	High
T22	Lucombe oak	Limb holes and flaking bark; however limited.	Low
T23	Sycamore	Limb holes, hollow trunk and hole at base.	Medium
G23	Lucombe oak, turkey oak	Two trees - various limb holes, tear-outs, dead limbs (some with splits) and flaking bark.	High
T24	Lucombe oak	Limb holes and four tear-outs.	Medium
T25	Lucombe oak	Possible hole at tear-out, three holes in dead limb and hole in trunk.	Medium
T26	Lucombe oak	Two limb holes and split on dead limb; however limited.	Low
T27	Common oak	Gaps at tear-out and cut on limb facing upward.	Medium
H28	Ash, blackthorn	-	Negligible
G29	Turkey oak, Lucombe oak, hybrid black poplar, ash, blackthorn	-	Negligible
T30	Lucombe oak	-	Negligible
G31	Ash	-	Negligible
T32	Common oak	-	Negligible
G33	Ash	-	Negligible
G34	Common oak	-	Negligible
G35	Common oak	-	Negligible
G36	Ash	-	Negligible
G37	Common oak, Scots pine	Five trees - various limb hole, tear-outs, holes at base of dead limbs, dead limb with splits and holes, other dead limbs, holes around cut limb and holes on trunk.	Medium
G38	Common oak	-	Negligible
G39	Sycamore, common oak, crack willow	-	Negligible
G40	Common oak, unknown, ash, sycamore, silver birch, hybrid black poplar	Number of trees - various limb holes, splits on limb, dead limb and ivy.	Medium

Tree No.	Species	Features Identified	Bat Roost Potential Category
T41	Lucombe oak	Woodpecker hole although on small limb, cavity facing upwards, split on fork of trunk and flaking bark at lower elevation.	Medium
G42	Lucombe oak, holm oak, turkey oak	-	Negligible
T43	Turkey oak	-	Negligible
T44	Horse chestnut	Multiple limb holes, tear-outs and flaking bark with two large cavities at tear-outs.	High
T45	Turkey oak	-	Negligible
T46	Turkey oak	-	Negligible
T47	Common oak	Dead limbs and two gaps underneath bark; however limited.	Low
T48	Lucombe oak	Limb hole, tear-out and two large cavities.	High
T49	Lucombe oak	Multiple limb holes, tear-outs and rotten limbs with holes and splits and two large cavities at limb holes.	High

Aerial Inspection of Trees

A4.25 No bats or evidence of bats was seen during the aerial inspection of the potential roosting features. Based on the aerial inspection of the features considered to have bat roosting potential, the bat roost potential category of the tree was revised appropriately, resulting in a number of trees (13) being downgraded and one tree upgraded. The results of the aerial tree inspection are shown in **Table EDP A4.6**.

Table EDP A4.6: Results of the aerial tree inspections.

Tree No.	Species	Features identified	Bat Roost Potential	
			Based on Ground Assessment	Based on Aerial Assessment
T1 (1)	Common oak	Cracks and splits	Medium	Low
T1 (2)	Common oak	-	Medium	Negligible
T1 (3)	Common oak	Cracks, splits, hollows and cavities	Medium	Medium
T1 (4)	Common oak	Hollows, cavities and natural holes	Medium	Medium
T1 (5)	Common oak	Cracks and splits	Medium	Medium
T1 (6)	Common oak	Cracks and splits	Medium	Low
T1 (7)	Common oak	Natural holes	Medium	Low
T1 (8)	Common oak	Natural holes	Medium	Medium
T1 (9)	Common oak	Natural holes	Medium	Low/Medium
T2	Turkey oak	-	Low	Negligible
T3	Sycamore	-	Low	Negligible
T6	Holm oak	Cracks and splits	Medium	Low/Medium
T23	Sycamore	Natural holes	High	Negligible
T25	Lucombe oak	Cracks and splits	Medium	Negligible

Tree No.	Species	Features identified	Bat Roost Potential	
			Based on Ground Assessment	Based on Aerial Assessment
T26	Lucombe oak	-	Low	Negligible
T27	Common oak	Natural holes, cracks and splits	Medium	Low/Medium
T47	Common oak	Cracks and splits	Low	Low/Medium
T48	Lucombe oak	Hollows, cavities, natural holes, cracks and splits	High	Medium/High

Investigations of Bat Foraging/Commuting Activity

Manual Transect Surveys

A4.26 The detailed results of the manual transect surveys are provided below, and the distribution of bat activity around the Application Site recorded during the surveys is illustrated on **Plan EDP 3**.

Dusk Transect Survey: 18 June 2014

Start time: 21:27

Finish time: 00:42

Sunset: 21:42

Weather conditions:

	Temp (°C)	Cloud Cover (%)	Precipitation	Wind (Beaufort)
Start	17.5	10	Nil	1
1 hr	17.4	20	Nil	1
2 hr	15.8	10	Nil	1
Finish	15.5	0	Nil	1

Surveyor 1

Time	Species	Activity
21:52	Common pipistrelle	Heard not seen along tree line.
21:57	Common pipistrelle	Foraging around oak tree.
22:03	Common pipistrelle, soprano pipistrelle	Foraging low to ground around trees.
22:17	Common pipistrelle	Heard not seen, one pass.
22:19	Serotine	Heard not seen.
22:37	Serotine	Heard not seen.
22:39	Common pipistrelle	Heard not seen, quiet call.
23:52	Common pipistrelle	Heard not seen.
00:49	Common pipistrelle	Heard not seen, brief call.

Surveyor 2

Time	Species	Activity
22:05	Common pipistrelle	Heard not seen.
22:09	Serotine	Foraging in field around stop 5.
22:12	Common pipistrelle	Two bats foraging in field.

Time	Species	Activity
22:16	Serotine	Foraging over field.
22:18	Myotis sp.	Continuous foraging.
22:18	Common pipistrelle	Continuous foraging.
22:31	Common pipistrelle	Commuting south west to north east along tree line.
22:59	Common pipistrelle	Heard not seen. Brief and quiet.
23:20	Common pipistrelle	Heard not seen, very quiet.
23:27	Serotine	Heard not seen, one pass.
23:31	Serotine	Heard not seen, one pass.
23:39	Serotine	Heard not seen.
23:51	Common pipistrelle	Heard not seen, two passes.
00:01	Serotine	Heard not seen, one pass.
00:14	Common pipistrelle	Heard not seen.
00:27	Common pipistrelle	Heard not seen.
00:29	Leisler's bat	Heard not seen, a few foraging passes.
00:41	Common pipistrelle	Heard not seen, one pass.

Dusk Transect Survey: 16 July 2014

Start time: 21:20

Finish time: 00:20

Sunset: 21:20

Weather conditions:

	Temp (°C)	Cloud Cover (%)	Precipitation	Wind (Beaufort)
Start	16.7	40	Nil	0
1 hr	17.1	50	Nil	1

Surveyor 1

Time	Species	Activity
21:44	Serotine	Heard not seen.
21:45	Common pipistrelle	Two bats flew east to west along tree line then returned.
21:48	Common pipistrelle and serotine	Flying eastwards.
21:50	Common pipistrelle	Flying westwards.
21:52	Leisler's bat	Flew north to south through parkland.
21:57	Serotine	Foraging overhead then headed south west along hedge.
22:07	Common pipistrelle	Foraged in field corner then headed north east.
23:15	Leisler's bat	Heard not seen.
23:20	Leisler's bat	Heard not seen.
23:29	Myotis sp.	Heard not seen.

Surveyor 2

Time	Species	Activity
21:50	Common pipistrelle	Foraging along tree line and into field.
21:58	Soprano pipistrelle	Foraging in circles over field.
22:02	Leisler's bat	Commuting pass along tree line.
22:04	Common pipistrelle	Foraging over field.
22:21	Common pipistrelle	Commuting along tree line.
22:23	Common pipistrelle	Heard not seen, one pass.
22:25	Common pipistrelle	Heard not seen, one pass.

Time	Species	Activity
22:28	Leisler's bat	Heard not seen, several passes.
22:31	Leisler's bat	Heard not seen, several passes.
22:32	Common pipistrelle	Heard not seen, one pass.
22:50	Common pipistrelle	Heard not seen, brief pass.
23:02	Myotis sp.	Heard not seen, one pass.
23:13	Myotis sp.	Heard not seen, several foraging passes.
23:19	Leisler's bat	Heard not seen, one pass.
23:23	Common pipistrelle	Heard not seen, one pass.

Dusk Transect Survey: 20 August 2014

Start time: 20:19

Finish time: 23:26

Sunset: 20:25

Weather conditions:

	Temp (°C)	Cloud Cover (%)	Precipitation	Wind (Beaufort)
Start	11.5	10	Nil	0
1 hr	8.1	0	Nil	0
2 hr	10.1	0	Nil	0
Finish	8.5	0	Nil	0

Surveyor 1

Time	Species	Activity
20:49	Leisler's bat	Commuting over field.
20:50	Common pipistrelle	Heard not seen.
20:51	Myotis sp.	Foraging in corner of field.
20:52	Common pipistrelle	Heard not seen.
20:55	Myotis sp.	Heard not seen.
20:55	Serotine	Heard not seen.
20:56	Common pipistrelle	Heard not seen.
20:58	Myotis sp.	Heard not seen.
20:59	Serotine	Heard not seen.
21:05	Common pipistrelle	Heard not seen.
21:06	Barbastelle	Commuting west across field.
21:09	Common pipistrelle	Heard not seen.
21:18	Leisler's bat	Heard not seen.
21:21	Common pipistrelle	Heard not seen.
21:52	Common pipistrelle	Heard not seen.
22:54	Myotis sp.	Heard not seen.
22:57	Common pipistrelle	Heard not seen.
23:15	Myotis sp.	Heard not seen.

Surveyor 2

Time	Species	Activity
20:32	Common pipistrelle	Heard not seen, very faint calls coming from woodland off site.
20:35	Common pipistrelle	Heard not seen, several foraging passes coming from woodland.
20:41	Soprano pipistrelle	Heard not seen, one pass.

Time	Species	Activity
20:48	Common pipistrelle	Commuting east along tree line.
20:54	Soprano pipistrelle	Commuting west along tree line.
20:59	Soprano pipistrelle and serotine	Serotine flew east along tree line, soprano pipistrelle heard not seen.
21:11	Serotine	Heard not seen, one pass.
21:25	Common pipistrelle	Heard not seen, one pass.
21:27	Long-eared bat	Heard not seen, one faint pass.
22:29	Common pipistrelle	Heard not seen, one pass.
22:32	Barbastelle	Heard not seen, one faint pass.
23:13	Myotis sp.	Heard not seen, one pass.

Dusk Transect Survey: 17 September 2014

Start time: 19:22

Finish time: 22:24

Sunset: 19:24

Weather conditions:

	Temp (°C)	Cloud Cover (%)	Precipitation	Wind (Beaufort)
Start	19.0	90	Nil	3
1 hr	18.3	10	Nil	4
2 hr	17.8	0	Nil	3
Finish	16.9	0	Nil	3

Surveyor 1

Time	Species	Activity
19:38	Common pipistrelle	Flew along hedge line then foraged in corner of field.
19:41	Soprano pipistrelle	Two bats flew along hedge and foraged in field corner.
19:43	Common pipistrelle	Same as above.
19:43	Soprano pipistrelle	Foraging in field between trees.
19:45	Soprano pipistrelle	Foraging in clearing between trees.
19:47	Common pipistrelle and soprano pipistrelle	Foraging in clearing between trees.
19:51	Myotis sp.	Heard not seen.
19:52	Leisler's bat	Heard not seen.
19:54	Common pipistrelle	Commuting across corner of field.
19:56	Leisler's bat	Heard not seen.
20:00	Leisler's bat	Flew across corner of field.
20:03	Common pipistrelle	Heard not seen.
20:05	Common pipistrelle	Heard not seen.
20:11	Common pipistrelle	Heard not seen.
20:23	Noctule	Heard not seen.
20:26	Common pipistrelle	Heard not seen.
20:38	Common pipistrelle	Heard not seen.
20:41	Myotis sp.	Heard not seen.
20:47	Leisler's bat	Heard not seen.
21:00	Soprano pipistrelle	Heard not seen.
21:01	Common pipistrelle	Heard not seen.
21:10	Common pipistrelle	Heard not seen.
21:15	Soprano pipistrelle	Heard not seen.

Time	Species	Activity
21:17	Common pipistrelle	Heard not seen.
21:23	Common pipistrelle	Social calls, heard not seen.
21:27	Long-eared bat	Heard not seen.
21:29	Soprano pipistrelle	Heard not seen. Several passes with social calls.
21:42	Long-eared bat	Heard not seen.
21:47	Nyctalus sp.	Heard not seen.
22:21	Common pipistrelle and Leisler's bat	Heard not seen.

Surveyor 2

Time	Species	Activity
19:38	Common pipistrelle	Calls faintly heard, coming from woodland off site.
19:39	Common pipistrelle	Heard not seen, one pass.
19:43	Soprano pipistrelle	Heard not seen, one pass.
19:45	Common pipistrelle	Commuting north along tree line, headed north off site.
19:50	Common pipistrelle	Two flew north along woodland edge.
19:52	Barbastelle	Flew south along woodland edge.
19:53	Common pipistrelle	Three flew north along woodland edge.
19:54	Common pipistrelle and soprano pipistrelle	Flew north along woodland edge.
19:57	Common pipistrelle	Heard not seen, one pass.
19:59	Serotine	Foraged around stop 4 then headed north.
20:00	Common pipistrelle	Heard not seen, one pass.
20:06	Common pipistrelle	Heard not seen, one pass.
20:07	Barbastelle	Heard not seen, one pass.
20:09	Long-eared bat	Foraging around stop 5 then flew into woodland.
20:12	Barbastelle	Two faint passes, heard not seen.
20:21	Myotis sp.	Commuting north over site.
20:23	Soprano pipistrelle	Heard not seen, one pass.
20:32	Soprano pipistrelle	Foraging in field corner.
20:43	Soprano pipistrelle	Heard not seen, brief pass.
20:47	Common pipistrelle	Heard not seen, one pass.
20:49	Serotine	Heard not seen, one pass.
21:15	Serotine	Heard not seen, several faint passes.
21:24	Leisler's bat	Heard not seen.
21:26	Leisler's bat	Heard not seen.
21:30	Soprano pipistrelle	Heard not seen, several passes and social calls.
21:33	Serotine	Heard not seen.
21:47	Common pipistrelle	Heard not seen, lots of foraging passes.
21:55	Myotis sp.	Heard not seen under tree canopy.
22:08	Serotine	Heard not seen, one pass.

Automated Detector Surveys

A4.27 The results of the automated detector surveys are provided in detail in **Tables EDP A4.7 to A4.10** and summarised in **Table EDP A4.11**.

Table EDP A4.7: Automated Detector Survey Results June 2014.

Position	Bat Species	Number of Bat Passes Recorded per Night						Total
		18 June	19 June	20 June	21 June	22 June	23 June	
1	Common pipistrelle	7	45	68	Anabat failed after three nights			120
	Soprano pipistrelle	1	53	19				73
	Noctule	3	4	2				9
	Myotis sp.	1	3	4				8
	Serotine	1		2				3
	Barbastelle		2					2
	Total	13	107	95	-	-	-	215
2	Common pipistrelle	37	85	351	305	104	247	1129
	Soprano pipistrelle	5	32	17	4	2	72	132
	Myotis sp.	7	3	4	10	6	4	34
	Barbastelle	6	2	5	6	5	6	30
	Noctule	9	2	2		1	4	18
	Serotine	1	3	2	1		2	9
	Lesser horseshoe	1			1	2		4
	Long-eared sp.	2		1				4
	Total	68	127	382	327	120	336	1360
3	Common pipistrelle	1	14	13	3	2	2	35
	Soprano pipistrelle	1	7	1	1		1	11
	Noctule	1	1	1	1		1	5
	Myotis sp.		1	2	1			4
	Total	3	23	17	6	2	4	55

Table EDP A4.8: Automated Detector Survey Results July 2014.

Position	Bat Species	Number of Bat Passes Recorded per Night					Total
		16 July	17 July	18 July	19 July	20 July	
4	Common pipistrelle	105	69	89	115	354	732
	Soprano pipistrelle	11	14	9	24	10	68
	Myotis sp.	7	2	6	6	4	25
	Noctule	4	5	2	1	1	13
	Leisler's bat	1			2	4	7
	Serotine				2	1	3
	Greater horseshoe		1		1		2
	Barbastelle					1	1
	Total	128	91	106	151	375	851
5	Soprano pipistrelle	81	43	22	79	141	366
	Common pipistrelle	77	23	49	65	58	272
	Myotis sp.	9	2	5	15	14	45
	Serotine	25	9	1	3	3	41
	Leisler's bat	7	1	2	4	3	17
	Barbastelle	2	1	5	1	1	10
	Noctule	3			1	3	7
	Long-eared sp.				4	2	6

	Total	204	79	84	172	225	764
6	Common pipistrelle	523	621	498	468	711	3001
	Soprano pipistrelle	6	3	7	4	3	23
	Myotis sp.	4	1	9	3		17
	Leisler's bat	1		4		1	6
	Noctule		1	3			4
	Long-eared sp.		1				1
	Total	534	627	521	655	715	3052

Table EDP A4.9: Automated Detector Survey Results August 2014.

Position	Bat Species	Number of Bat Passes Recorded per Night						Total
		20 Aug	21 Aug	22 Aug	23 Aug	24 Aug	25 Aug	
1	Common pipistrelle	40	255	42	58	344	95	834
	Soprano pipistrelle	3	15	5	1	111	29	164
	Myotis sp.	3	4	1	3	33	5	49
	Total	46	274	48	62	488	129	1047
2	Common pipistrelle	9	108		Anabat failed after three nights			117
	Barbastelle	23	7					30
	Myotis sp.	6	11	1				18
	Soprano pipistrelle		16					16
	Noctule		13					13
	Leisler's bat	3	6					9
	Serotine	1	1					2
	Long-eared sp.		1					1
	Total	42	163	1	-	-	-	206
3	Common pipistrelle		15	1	1	22	13	52
	Soprano pipistrelle		4			12	3	19
	Noctule		1			1		2
	Total	0	20	1	1	35	16	73

Table EDP A4.10: Automated Detector Survey Results September 2014.

Position	Bat Species	Number of Bat Passes Recorded per Night						Total
		18 Sept	19 Sept	20 Sept	21 Sept	22 Sept	23 Sept	
4	Myotis sp.	1	6	16	4	9	85	121
	Soprano pipistrelle	13	11	17	22	14	16	93
	Common pipistrelle	3	18	16	17	10	22	86
	Barbastelle	3	9	7	5	5	1	30
	Noctule	2	3	3	1	3	5	17
	Leisler's bat	1	2	2		2		7
	Lesser horseshoe	1		2	3		1	7
	Nathusius' pipistrelle	1	1			1	1	4
	Long-eared sp.				1		1	2
	Serotine						1	1
	Total	25	50	63	53	44	133	368

Position	Bat Species	Number of Bat Passes Recorded per Night						Total
		18 Sept	19 Sept	20 Sept	21 Sept	22 Sept	23 Sept	
5	Soprano pipistrelle	132	81	165	96	72	93	639
	Myotis sp.	8	39	18	4	64	26	159
	Common pipistrelle	22	33	42	13	20	25	155
	Barbastelle	9	23	28	11	17	15	103
	Leisler's bat	2	4	4	6	3	3	22
	Noctule	5	6	4	1		3	19
	Long-eared sp.	4	2	2	2		1	11
	Nathusius' pipistrelle	1			2	5	2	10
	Serotine	2	1					3
	Total	185	189	263	135	181	168	1121
6	Common pipistrelle	57	9	10	6	11	12	105
	Noctule		2	3				5
	Soprano pipistrelle	1	3					4
	Myotis sp.				1	1		2
	Greater horseshoe		1					1
	Barbastelle	1						1
	Total	59	15	13	7	12	12	118

Table EDP A4.11: Automated Detector Survey Monthly Summary.

Survey month	Species Recorded	No. passes recorded	% of total
June	Common pipistrelle	1284	78.8
	Soprano pipistrelle	216	13.3
	Myotis sp.	46	2.8
	Noctule	32	2.0
	Barbastelle	32	2.0
	Serotine	12	0.7
	Lesser horseshoe	4	0.2
	Long-eared sp.	4	0.2
	Total	1630	
July	Common pipistrelle	4005	85.8
	Soprano pipistrelle	457	9.8
	Myotis sp.	87	1.9
	Serotine	44	0.9
	Leisler's bat	30	0.6
	Noctule	24	0.5
	Barbastelle	11	0.2
	Long-eared sp.	7	0.1
	Greater horseshoe	2	<0.1
	Total	4667	
August	Common pipistrelle	1003	75.6
	Soprano pipistrelle	199	15.0

Survey month	Species Recorded	No. passes recorded	% of total
	Myotis sp.	67	5.1
	Barbastelle	30	2.3
	Noctule	15	1.1
	Leisler's bat	9	0.7
	Serotine	2	0.2
	Long-eared bat	1	0.1
	Total	1326	
September	Soprano pipistrelle	736	45.8
	Common pipistrelle	347	21.6
	Myotis sp.	282	17.5
	Barbastelle	134	8.3
	Noctule	41	2.5
	Leisler's bat	29	1.8
	Nathusius' pipistrelle	14	0.9
	Long-eared sp.	13	0.8
	Lesser horseshoe	7	0.4
	Serotine	4	0.2
	Greater horseshoe	1	0.1
	Total	1608	