

Southampton to London Pipeline Project

Volume 6

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Appendix 7.7: Bat Factual Report (1 of 3)

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Southampton to London Pipeline Project

Esso Petroleum Company, Limited

Appendix 7.7: Bat Factual Report

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Jacobs U.K Limited

1180 Eskdale Road
Winnersh, Wokingham
Reading RG41 5TU
United Kingdom
T +44 (0)118 946 7000
F +44 (0)118 946 7001
www.jacobs.com

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1. Introduction

1.1 Overview

- 1.1.1 Esso Petroleum Company, Limited (Esso) is making an application for development consent to replace 90km (56 miles) of its existing aviation fuel pipeline that runs from the Fawley Refinery near Southampton, to the Esso West London Terminal storage facility in Hounslow. The replacement pipeline is 97km (60 miles) long and is referred to as 'the project' within this Bat Factual Report.
- 1.1.2 This Bat Factual Report has been produced to support the application for development consent under the Planning Act 2008, and the accompanying Environmental Statement (ES).

1.2 Scheme Description

- 1.2.1 Esso has already replaced 10km of pipeline between Hamble and Boorley Green in Hampshire and now wants to replace the 90km of pipeline between Boorley Green and the Esso West London Terminal storage facility in Hounslow. The areas of land to be permanently or temporarily used for the project are known as the Order Limits.
- 1.2.2 The replacement pipeline starts near Boorley Green at the end point of the previously replaced pipeline. The route runs generally in a northeast direction via Esso's Pumping Station in Alton. It terminates at the Esso West London Terminal storage facility. The project is described in Chapter 3 Project Description.

1.3 Legal Context

- 1.3.1 All British bat species are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017. The combined effect of the legislation makes it an offence to:
- deliberately capture, injure or kill a bat;
 - deliberately disturb a bat, in such a way as to be likely to:
 - impair their ability:
 - to survive, breed or reproduce or rear or nurture their young; or
 - to hibernate or migrate;
 - affect significantly the local distribution or abundance of that bat species;
 - damage or destroy a breeding site or resting place of any bat;
 - intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection; or
 - intentionally or recklessly obstruct access to any place that a bat uses for shelter or protection (this is taken to mean all bat roosts whether bats are present or not).
- 1.3.2 In addition, five British bat species are listed on Annex II of the Habitats Directive. These are:



- greater horseshoe bat (*Rhinolophus ferrumequinum*);
- lesser horseshoe bat (*Rhinolophus hipposideros*);
- Bechstein's bat (*Myotis bechsteinii*);
- barbastelle (*Barbastella barbastellus*); and
- greater mouse-eared bat (*Myotis myotis*).

1.3.3 In certain circumstances where these species are found, the Habitats Directive requires the designation of Special Areas of Conservation (SAC) by European Community (EC) member states to ensure that their populations are maintained at a favourable conservation status. Outside SACs, the level of legal protection that these species receive is the same as for other bat species.

2. Methodology

2.1 Introduction

2.1.1 The survey methodology is based on that described in the project's Scoping Report (Esso, 2018) and has also been informed by good practice guidelines (Collins, 2016); consultation and engagement with relevant consultees e.g. Natural England; the results of desk studies; and professional judgement.

2.1.2 The route of the replacement pipeline is 97km long and the Order Limits support many hundreds of trees. The requirement to fell trees during construction would be unavoidable. However, it is not yet known which individual trees would be directly affected by construction. This would not be confirmed until the detailed design phase of the project, following the granting of any development consent.

2.1.3 Impacts to trees and potential roosts would be reduced through embedded and good practice measures set out in the Register of Environmental Actions and Commitments (REAC, in Chapter 16 Environmental Management and Mitigation) and secured through Development Consent Order requirements such as the Code of Construction Practice. Examples of relevant embedded or good practice measures are listed below (the reference numbers quoted refer to the relevant item within the REAC):

- commitment to only utilise a 10m width when crossing through boundaries between fields where these include hedgerows, trees or watercourses (O1);
- alternative roost structures (bat boxes) would be provided (with landowner consent) on retained trees within the Order Limits. Three boxes would be provided for all trees with moderate bat roost potential to be felled. Five boxes would be provided for all trees with high bat roost potential to be felled (G56); and
- buildings, structures and trees within the Order Limits, confirmed to have high or moderate potential to support bats, that do not require removal, would be retained and protected with an appropriate buffer zone. Those that require removal and have high or moderate potential for bat roosts would be surveyed



prior to their removal and either removed, or removed under licence from Natural England if roosts are confirmed to be present (G174).

- 2.1.4 The full list of the project's commitments can be found in the REAC in Chapter 16 Environmental Management and Mitigation.
- 2.1.5 This bat assessment does not aim to confirm the presence or likely absence of bats from all trees within the Order Limits. The aim of the survey work was to identify the locations where there is a high risk of bat presence. The results informed the alignment of the Order Limits, Limits of Deviation, and the requirement for any location-specific good practice measures to reduce the risk and/or impact to bats, especially rarer species (refer to Chapter 4 Design Evolution and Chapter 16 Environmental Management and Mitigation for more information).
- 2.1.6 Pre-construction surveys would be completed if existing baseline survey data need to be updated to confirm presence or likely absence of bats, or supplemented, such as in areas where access was limited prior to construction (G33) (see Section 2.4). The scope of those pre-construction surveys has been informed by the results of the surveys undertaken in 2018 (see Section 3.2).

2.2 Desk Study

Data Searches

- 2.2.1 The geographical extent of the data search requests varied based on the respective data provider's capabilities or resources; all of the requests were made as per good practice to established biological record centres or organisations which collate these records. A desk study has been undertaken involving the collection of existing records within a minimum study area of 1km radius from the Order Limits (see Chapter 4 Design Evolution).
- 2.2.2 Results were received from Greenspace Information for Greater London (GiGL), Surrey Biodiversity Information Centre (SBIC) and Hampshire Biodiversity Information Centre (HBIC) from within 1km of the Order Limits. Data from within 5km of the Order Limits were received from Hampshire Bat Group and from within 2km from Surrey Bat Group.
- 2.2.3 The locations of all bat European Protected Species Mitigation (EPSM) licences within 1km were reviewed using the MAGIC (Multi-Agency Governmental Information Centre) website [accessed October 2018].
- 2.2.4 Special Areas of Conservation (SAC) designated for bats within 10km of the study area were identified by assessing the MAGIC website.

Assessment of Habitat Value

- 2.2.5 Aerial imagery (including high-resolution photographs obtained from a light aircraft survey) and habitat survey information where available (e.g. habitat maps provided by HBIC and the results of Phase 1 habitat surveys undertaken for the project) were used to identify habitat features with high potential to be used by commuting, foraging and roosting bats within or immediately adjacent to the Order Limits.



- 2.2.6 An assessment was undertaken to determine the likely value of habitat for bats within the Order Limits. This evaluation aided in prioritising areas for survey and the likelihood of encountering rare bat roosts. The evaluation took account of the following:
- results of the records requested from biological record centres and relevant County bat groups;
 - core sustenance zones (CSZ) as applied to bats, refer to the area surrounding a communal bat roost within which habitat availability and quality would have a substantial influence on the resilience and conservation status of the colony using the roost);
 - conservation status of bat species recorded, or likely to be present, within the Order Limits; and
 - habitat type and connectivity, such as riparian features, hedgerows, woodland and veteran trees.
- 2.2.7 This method makes use of guidance provided by Collins (2016) and Wray *et al.* (2010) as well as professional judgement.
- 2.2.8 Table 2.1 describes how conservation value was assigned.
- 2.2.9 Table 2.2 provides the framework used to value individual areas of habitat for bats. The framework also identifies features that might indicate a greater or lesser likelihood of roost presence. In each case, the habitat was valued based on the highest category of relevance to that location.
- 2.2.10 Table 2.3 summarises the risk of impacting roosts as a result of construction activity.

Table 2.1: Categories of Rarest, Rarer and Common Bats in England (Taken from Wray *et al.* (2010))

Rarity Within Range	Common Name	Latin Name
Rarest (estimated population under 10,000)	Bechstein's bat	<i>Myotis bechsteinii</i>
	Alcathoe's bat	<i>Myotis alcathoe</i>
	Greater mouse-eared bat	<i>Myotis myotis</i>
	Barbastelle	<i>Barbastella barbastellus</i>
	Grey long-eared	<i>Plecotus austriacus</i>
Rarer (population between 10,000 – 100,000)	Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>
	Whiskered bat	<i>Myotis mystacinus</i>
	Brandt's bat	<i>Myotis brandtii</i>
	Daubenton's bat	<i>Myotis daubentonii</i>
	Natterer's bat	<i>Myotis nattereri</i>
	Leisler's bat	<i>Nyctalus leisleri</i>
	Noctule	<i>Nyctalus noctula</i>
	Nathusius' pipistrelle	<i>Pipistrellus nathusii</i>
	Serotine	<i>Eptesicus serotinus</i>
Common (population over 100,000)	Common pipistrelle	<i>Pipistrellus pipistrellus</i>
	Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>
	Brown long-eared bat	<i>Plecotus auritus</i>



Table 2.2: Features That Influence the Likely Value of Habitats Used by Roosting Bats

High Value	Medium Value	Low Value
The location is well-connected to wider areas of high value bat habitat e.g. Ancient Woodland, broadleaved woodland, parkland, wetland, hedgerows or grazed pasture.	The location has moderate or limited connectivity to wider areas of high value bat habitat; or the location is well-connected to wider areas of moderate or lower value bat habitat e.g. intensively managed agricultural land, secondary woodland.	Isolated trees in urban environments or intensively managed agricultural land with poor habitat connectivity to better foraging habitat.
The location is within the CSZ of the roost of a rare bat and supports trees with moderate or high potential roosting features.	The location is within the CSZ of the roost of a rarest bat species and supports trees with moderate or high potential roosting features.	The location may be within the CSZ of the roost of a rarer or rarest bat but it only supports trees with low or negligible potential roosting features.

Table 2.3: The Risk of Impacts to Roosts

High Risk	Medium Risk	Low Risk
A tree with high potential to support roosts may be felled	A tree with moderate potential to support roosts may be felled.	A tree with low or negligible potential to support roosts may be felled.
A tree with high potential to support roosts may be isolated from commuting or foraging grounds as a result of construction activities severing well-used flight paths.	A tree with moderate potential to support roosts may be isolated from commuting or foraging grounds as a result of construction activities severing well-used flight paths.	A tree with low potential to support roosts may be isolated from commuting or foraging grounds as a result of construction activities severing well-used flight paths.

2.2.11 Tables 2.2 and 2.3 are based on Collins (2016), knowledge of the project, and professional judgement. The information in Tables 2.1 to 2.3 was illustrated geographically using Geographical Information Systems (GIS) and a series of index values. The index values were assigned based on a hierarchy of importance as shown in Table 2.4, with a weighting assigned to the records of roosts for rarest bats.

2.2.12 An area was assessed as being: potentially 'high' value for bats if it scored within the upper quartile of the total index value; potentially 'medium' value if it scored in the middle two quartiles of the total index value; and potentially 'low' if it scored in the lower quartile.

2.2.13 The results were used to inform the Order Limits and Limits of Deviation, the requirement for good practice measures (e.g. reducing the construction working width or retaining trees) and the location and scope of field surveys.

Table 2.4: Index of Values Assigned to Assess the Likely Risk of Potential Roost Features Being Encountered

Criteria	Index Value
Habitat	
Urban, hardstanding, roads	1
Arable, grassland (all) or unidentified habitats	2
Riparian, hedgerows	3



Criteria	Index Value
Broadleaved, mixed, conifer woodland and parkland	4
Ancient Woodland	5
Number of overlapping bat CSZ	
0 – 10	1
11 – 50	2
51+	3
Within CSZ of roosts of rarest bats (as listed in Table 2.1)	
All rarest bat species	1

Building Assessment

- 2.2.14 There are a small number of garages at Stake Lane to the west of Farnborough within the Order Limits that are due to be demolished. These were initially assessed using aerial imagery and the results of the data searches.

2.3 Field Survey

- 2.3.1 In line with the Bat Conservation Trust (BCT) guidelines (Collins, 2016), surveys focused on those areas in which proposed construction works could contribute to an adverse effect on bat populations or could result in contravention of the legislation protecting bats.
- 2.3.2 Field surveys therefore focused on features within 10m of the Order Limits that offered potential roosting opportunities for bats.

Preliminary Ground Level Tree Roost Assessments

- 2.3.3 Where land access permitted (see Section 2.4), preliminary ground level tree roost assessments were undertaken on all trees identified in the desk study as having potential to support bats and which lie within 10m of the Order Limits (the survey area). Ecologists assessed each tree within the survey area for its potential to contain potential roost features (PRF) suitable for bats.
- 2.3.4 These surveys were undertaken in accordance with current good practice guidelines (Collins, 2016; British Standards Institution, 2015; Andrews, 2013; BTHK, 2018). A suitably experienced team of ecologists, licensed where necessary, assessed each tree from the ground with the use of torches, binoculars and an endoscope. All evidence of the presence of bats or features that had or may have potential as roost sites (e.g. woodpecker holes, cavities, splits or lifted bark) were recorded and the location mapped.
- 2.3.5 Value was assigned to each tree based on the quality and quantity of PRFs identified. The locations of all trees with PRFs rated as ‘high’ or ‘moderate’ potential (based on Collins (2016)) were recorded and the trees tagged to aid future identification in the field. In some locations trees with ‘low’ or ‘negligible’ potential were also recorded to aid route design and to act as confirmation that trees at that location had been assessed.



- 2.3.6 When PRFs or confirmed roosts were identified, these informed the evolution of the project's design, specifically the final positioning of the Order Limits, Limits of Deviation and associated construction works areas.

Detailed Inspection/Climbing Inspection Surveys

- 2.3.7 Where land access permitted (see Section 2.4) within 10m of the Order Limits, trees with moderate or high roost potential or those that were confirmed roosts, were subject to a single climbing inspection survey. The aim of these inspections was to confirm the status of the PRF, likely bat species or numbers of bats which may utilise the PRF, the kind of roost the PRF has potential to contain, and to identify any evidence that might confirm the presence or likely absence of bat roosts.
- 2.3.8 The climbing inspection surveys involved climbing the trees to inspect the PRFs in more detail. These surveys were undertaken by qualified and licensed tree-climbing ecologists. The trees were climbed using ropes, harnesses and/or ladders. Trees were only climbed if safe to do so, as assessed on a case-by-case basis (see Section 2.4).
- 2.3.9 A detailed inspection of each PRF was undertaken using high powered torches, mirrors and endoscopes to further assess the feature's suitability as a roost and to search for evidence of bats (e.g. bat droppings, odour, staining or a bat in residence).
- 2.3.10 The results of the climbing inspections were used to refine the category assigned to each PRF based on the following criteria:
- negligible potential – feature provides no potential to support bats because it is superficial;
 - low potential – feature unlikely to be used by bats as it is too shallow, wet or illuminated;
 - moderate potential – feature offers some suitable conditions for roosting and could possibly be used by small numbers of bats;
 - high potential – feature offers ideal conditions for roosting e.g. deep cracks with stable temperatures, in suitable habitat, relatively dry with the potential to hold a large number of bats; or
 - roost – this is where a confirmed roost has been identified e.g. bats or bat droppings were observed.

Emergence/Re-Entry Surveys

- 2.3.11 A limited number of dusk emergence/dawn re-entry surveys were undertaken on specific trees that could not be climbed for safety reasons and where there was considered to be high potential for roost presence based on the value of the surrounding habitats. The aim of these surveys was to determine presence or likely absence of bats, and if bats were found to determine the likely usage of the roost e.g. mating or maternity roosts.
- 2.3.12 These surveys followed good practice guidelines described in Collins (2016). Trees were surveyed by suitably experienced ecologists at dusk and/or dawn to watch for,



listen to and record bats exiting and entering roosts. Surveyors were equipped with heterodyne (Batbox Duet) and frequency division (Analook Express) bat detectors capable of recording calls.

- 2.3.13 All surveys were undertaken between July and early October during suitable weather conditions.
- 2.3.14 Where access allowed (see Section 2.4), trees with high roost potential were surveyed three times and trees with moderate roost potential were surveyed twice. The duration of each survey is shown in Table 2.5.

Table 2.5: Presence/Likely Absence Survey Timings According to Best Practice Guidelines (Collins, 2016)

Survey Type	Start Time	End Time
Dusk emergence	15 minutes before sunset	1.5 – 2 hours after sunset
Dawn re-entry	1.5 – 2 hours before sunrise	15 minutes after sunrise

- 2.3.15 Bat recordings were analysed using Analook software, with reference to Russ (2013) to aid species identification. Where sonograms were not identified to species level due to the overlapping call parameters of some species, the calls were identified to genus level.

2.4 Constraints

- 2.4.1 Data were received from both the county biological information centre and the county bat groups for Hampshire and Surrey. These groups share their information, so it is likely that some of the records may be duplicated and there may be more bat records within the study area than is accurate. This could lead to an overly precautionary assessment of the potential value of a habitat for bats (Figure A7.7.1). However, this is not considered a constraint as the surveys undertaken have identified all trees with potential to support roosts and pre-construction surveys would be completed if existing baseline survey data need to be updated or supplemented (G33).
- 2.4.2 The assessment of habitat value is a high-level assessment which provides an indication of a habitat’s potential value for bats. It relies upon historic bat records and so is biased towards locations with the greatest number of records and/or locations with the known presence of the rarest bats.
- 2.4.3 Land access was dependent on a land owner’s consent. Access was obtained for the majority of the field survey study area (90%), although land owner permission was refused or not obtained for some locations. In addition to land owner permission, changes in design occurred too late in the field season to gain land access again from previously accessed land. The locations of areas not surveyed are shown in Figure A7.7.2, and total 10% of the total area identified as suitable roosting habitat for bats.
- 2.4.4 Site conditions at points during the field season sometimes inhibited both ground and tree climbing surveys, due to the presence of dense vegetation limiting views of, or access to, trees. This inhibited the surveyors’ ability to thoroughly visually



check some trees from every angle. Any trees due to be felled with potential for bats would have pre-construction surveys undertaken prior to removal.

- 2.4.5 Health and safety concerns made some trees unsafe to climb (e.g. dead or dying trees, presence of hornet nests). Where considered necessary, trees that could not be climbed such as dead or verge-side trees and those located in high or medium risk areas according to the index assessment were subject to an emergence/re-entry survey. As a minimum all trees in accessible areas were subject to a ground-level tree roost assessment.
- 2.4.6 To address the above constraints and where tree felling is required in these areas, pre-construction surveys would be undertaken (G33). If impacts to bats are anticipated, a licence from Natural England would be sought (G43, G174), and all relevant works would be undertaken in accordance with the relevant requirements and conditions set out in those licences (G43). Draft licence application method statements are outlined in Appendix 7.17 Protected and Controlled Species Legislation Compliance Report.

3. Results

3.1 Desk Study

Data Searches

- 3.1.1 Bat records were received from HBIC, Hampshire Bat Group, and Surrey Bat Group. These have been summarised in Table 3.1 based on the species' CSZ. GiGL confirmed there were no records of bat roosts within the study area. Protected species records were also requested from SBIC in January 2018, however on writing this report no records had been received.
- 3.1.2 At least 12 bat species (Bechstein's bat, Brandt's/whiskered bat, brown long-eared bat, common pipistrelle, Daubenton's bat, Leisler's bat, Nathusius' pipistrelle, Natterer's bat, noctule, soprano pipistrelle, serotine and barbastelle) have been recorded roosting in the Hampshire study area. Eight bat species (serotine, brown long-eared bat, common pipistrelle, Daubenton's bat, Nathusius' pipistrelle, Natterer's bat, noctule and soprano pipistrelle) have been recorded roosting within the Surrey study area. With the exception of serotine, all of these species commonly roost in trees.
- 3.1.3 An assessment of the records indicates that none of the identified roosts fall within 10m of the Order Limits (where accurate grid references or descriptions were provided). However, several grid squares within which the record is located do overlap the Order Limits. Most roost records relate to roosts in buildings, none of which would be affected by the route or associated construction activity.
- 3.1.4 Two species in Annex II of the Habitats Directive were identified as being present within the study area: barbastelle and Bechstein's bat. There are 11 records of barbastelle roosts and 22 other records (e.g. mist netting or recordings) within the desk study area. There is one record of Bechstein's bat within the study area. The focus of these results is within Blackhouse Copse and Joan's Acre Wood to the



south of Hinton Ampner. The Order Limits pass to the immediate east of these woodlands.

- 3.1.5 A search carried out on MAGIC (Natural England, 2018) returned 41 records of bat EPSM licences issued by Natural England within 1km of the Order Limits. The species affected included common pipistrelle, soprano pipistrelle, brown long-eared bat, whiskered bat and Natterer's bat. Only one of these records falls within the immediate vicinity of the Order Limits, at Wolfhanger Farm, West Tisted for common pipistrelle and Natterer's bat in 2014.
- 3.1.6 MAGIC searches confirmed there are no SACs with bat species as a qualifying feature located within 10km of the Order Limits.
- 3.1.7 The desk study results are provided in Figure A7.7.1.



Table 3.1: Summary of Desk Study Records With Numbers Denoting Individual Records per Species

Data source, location and type of record (*Note: The records below all relate to locations where the grid square within which the record is located, overlaps with the Order Limits. None of the roost records identified appear to relate to roosts within the Order Limits and instead relate to roosts in buildings outside the Order Limits.)	Bechstein's bat	Brandt's bat	Brown long-eared bat	Common pipistrelle	Daubenton's bat	Leisler's bat	Long-eared bat	Myotis bat	Nathusius' pipistrelle	Natterer's bat	Noctule	Pipistrelle species	Serotine	Soprano pipistrelle	Whiskered/Brandt's bat	Barbastelle
Hampshire biological records (HBIC and Hampshire Bat Group)																
Within Order Limits (incl. 10m buffer) – roost records*	0	0	2	2	0	0	1	1	0	0	0	3	2	0	0	0
Within Order Limits (incl. 10m buffer) – fly by records	0	0	3	11	0	0	1	2	0	0	1	18	2	10	0	0
Outside Order Limits – records (including roosts) that fall within species CSZ	1	1	134	430	23	8	147	115	21	71	187	120	205	226	4	33
Outside Order Limits – roosts within CSZ (incl. hibernacula)	0	0	78	107	0	1	60	5	0	43	0	44	22	20	0	11
Surrey biological records (Surrey Bat Group)																
Within Order Limits (incl. 10m buffer) – roost records*	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Within Order Limits (incl. 10m buffer) – fly by records	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Outside Order Limits – records (including roosts) that fall within species CSZ	0	0	57	97	8	0	8	9	16	0	32	13	17	115	2	0
Outside Order Limits – records of roosts within CSZ	0	0	35	28	0	0	7	1	0	0	0	11	1	17	0	0



Assessment of Potential Habitat Value

3.1.8 The mapping assessment of habitats and biological records revealed several areas that are of potential importance for bats in Hampshire and Surrey. Values from Table 2.4 were combined using GIS data analysis and the resulting scores were illustrated as a 'heat map' to show the potential value of habitats within the vicinity of the Order Limits for commuting and foraging bats (see Figure A7.7.1). Locations within the Order Limits with potential high value comprise:

- Section A - Boorley Green to Bramdean
 - woodland belt crossing to the north of Stakes Lane;
 - hedgerow crossings to east of Lower Preshaw Farm;
 - woodland belt to south of Wheely Down Farm Lane;
 - treeline connecting to Joan's Acre Wood;
 - Malthouse Plantation; and
 - Brockwood Copse and Roadside Strips Site of Importance for Nature Conservation and boundary to its southwest.
- Section B - Bramdean to South of Alton
 - woodland belt crossing to the west of Staply Lane; and
 - woodland belt to the south of Chawton;
- Section C - South of Alton to Crondall (via Alton pumping station)
 - boundary crossing to the north of Coldrey Farm;
 - boundary crossing to the west of Isnage Farm Lane; and
 - boundary crossing at Dippenhall Road.
- Section D – Crondall to Farnborough
 - Oak Park golf course

3.1.9 The locations listed above are predominantly considered to be of high value due to their proximity to known sites that support Bechstein's or barbastelle bats.

3.2 Field Study

Preliminary Ground Level Tree Roost Assessments

3.2.1 In total, approximately 1,262 trees have been assessed. Of these, 582 fall within 10m of the Order Limits. All 582 of these trees were subject to preliminary ground-level surveys between February 2018 and March 2019.

3.2.2 The categories assigned to each of the surveyed trees are summarised in Table 3.2.



Table 3.2: Results of Preliminary Ground Roost Assessments of Trees Within 10m of the Order Limits (Note: A Tree’s Category was Subject to Change Following the Climbing Inspection Surveys)

Category Based on Preliminary Ground Roost Assessment	Number of Trees
Confirmed roost	1
High	123
Moderate	336
Low	90
Negligible	30
Unknown	2
Total	582

Detailed Inspections/Climbing Inspection Surveys

- 3.2.3 Over 260 trees were climbed once between July and October 2018. Of these, 169 are within 10m of the Order Limits. In some cases, the roost category assigned during the preliminary ground tree roost assessments was downgraded or upgraded based on these detailed inspections.
- 3.2.4 A summary of the results of the tree climbing surveys is provided in Table 3.3. A location plan showing each of the trees is provided in Figure A7.7.2. Detailed tree climbing survey results can be found in Annex A.

Table 3.3: Summary of Results of Detailed/Climbing Inspection Surveys of Trees Within 10m of the Order Limits (Note: Not All Trees Were Climbed, see Annex A for Details)

Tree Roost Category	Number of Trees
Confirmed roost	2
High	45
Moderate	62
Low	32
Negligible	28
Total trees climbed within 10m of the Order Limits	169

Emergence/Re-Entry Surveys

- 3.2.5 Emergence/re-entry surveys were completed on 25 trees, of which only 18 remain within 10m of the Order Limits (see Table 3.4). These trees were originally identified in spring or early summer 2018 in areas of high priority for bats but where climbing was not possible.
- 3.2.6 Surveys took place in suitable weather conditions, with surveys being rescheduled if weather conditions were sub-optimal (see Table 1 in Annex A for full details). See Figure A7.7.2 for tree locations.



Table 3.4: Summary of Emergence/Re-Entry Survey Results of Trees Within 10m of the Order Limits

Tree ID	Roost Potential From Initial Ground-Based Survey	Roost Potential Following Climbing Survey (If Changed)	1st Visit	2nd Visit	3rd Visit (If Applicable)	Roost Present (Yes/No)
1970_64_00887	Moderate	High	18/09/18 (dusk)	03/10/18 (dawn)	N/A	No
1970_64_00886	Moderate	High	18/09/18 (dusk)	03/10/18 (dawn)	N/A	No
1970_64_00885	Moderate	High	17/09/18 (dusk)	03/10/18 (dawn)	N/A	Yes – confirmed during emergence surveys
1970_64_00884	Moderate	Moderate	17/09/18 (dusk)	03/10/18 (dawn)	N/A as feature was inspected from the ground with an endoscope	No
8940_144_00583	High	High	30/07/18 (dusk)	23/08/18 (dawn)	17/09/18 (dusk)	No
8940_144_00582	Moderate	Not climbed	31/07/18 (dawn)	23/08/18 (dawn)	N/A	No
8940_144_00580	Moderate	Not climbed	31/07/18 (dawn)	22/08/18 (dusk)	N/A	No
8940_144_00569	High	Not climbed	31/07/18 (dusk)	24/08/18 (dawn)	18/09/18 (dusk)	No
8940_00082	Moderate	Negligible	31/07/18 (dusk)	24/08/18 (dawn)	N/A	No
8910_142_3	Moderate	Not climbed	30/08/18 (dawn)	04/09/18 (dusk)	N/A	No
8910_142_2	Moderate	Not climbed	30/08/18 (dawn)	04/09/18 (dusk)	N/A	No
8850_129_00006	Moderate	Negligible	03/09/18 (dusk)	25/09/18 (dawn)	N/A	No
441_7_00840	Moderate	High	21/08/18 (dusk)	18/09/18 (dawn)	N/A as was subsequently climbed	No
441_7_00096	Moderate	Not climbed	21/08/18 (dusk)	18/09/18 (dawn)	N/A	No
3200_91_01849	Moderate	Low	03/09/18 (dusk)	19/09/18 (dusk)	N/A	No
3200_91_01848	Moderate	Low	03/09/18 (dusk)	19/09/18 (dusk)	N/A	No
27970_985	Moderate	Not climbed	30/08/18 (dusk)	26/09/18 (dawn)	N/A	No



Tree ID	Roost Potential From Initial Ground-Based Survey	Roost Potential Following Climbing Survey (If Changed)	1st Visit	2nd Visit	3rd Visit (If Applicable)	Roost Present (Yes/No)
27970_587	Moderate	High	30/08/18 (dusk)	26/09/18 (dawn)	N/A as was subsequently climbed	No

Summary of Tree Survey Results

- 3.2.7 Detailed inspection surveys clarified and confirmed the results of preliminary ground level roost assessments, with some trees being downgraded or upgraded accordingly.
- 3.2.8 Of the 582 trees within 10m of the Order Limits that were initially subject to ground level assessment surveys: three roosts were confirmed; 121 trees were classified as having high potential for bat roosts; and 335 trees were classified as having moderate potential for bat roosts (Figure A7.7.2 for locations). Two trees could not be fully assessed due to land access constraints but have at least moderate potential to support roosts. The remaining trees had low or negligible potential to support roosts.
- 3.2.9 Further details with respect to the three roosts are provided:
- tree ID: 4450_00215: an unknown bat species was found in a frost crack during preliminary ground level surveys. Surveyors were not able to get a clear view to confirm species.
 - tree ID: 1970_64_00885: a common pipistrelle was observed emerging from a wound, 45 minutes after sunset on the 18 September 2018.
 - tree ID:4120_110: a common pipistrelle was observed and at least one other was heard calling (using a bat detector) in a wound with two cavities on the underside of a branch during climbing surveys. This tree is located in an area that would be unaffected by construction activity due to the use of trenchless construction techniques.

Buildings Assessments

- 3.2.10 The only building removal required involves the dismantling of nine garages at Stake Lane. These garages are within a block consisting of single brick walls on three sides, flat roofs and conventional garage doors. They are thought to have been constructed since the 1960s.
- 3.2.11 The garages were given a preliminary external inspection and photographs were taken on the 16/01/2019, See Photographs 7.7.1 to 7.7.4. No internal inspection or detailed inspection using an endoscope was undertaken at this time.
- 3.2.12 Given the design and age of these garages, they are considered to have low suitability for bat roosts as they do not provide sufficient features to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation) (Collins, 2016). The barrage boards provide only opportunistic transitional roosting potential for one or two bats.



Photograph 7.7.1: Stakes Lane garages, 16/01/2019, standard lens



Photograph 7.7.2: Stakes Lane garages, 16/01/2019, standard lens



Photograph 7.7.3: Stakes Lane garages, 16/01/2019, standard lens



Photograph 7.7.4: Stakes Lane garages – under barge boards, 16/01/2019, standard lens

4. Discussion

- 4.1.1 Since surveys began in February 2018, approximately 1,262 trees have been assessed, although not all these trees are now within 10m of the Order Limits.
- 4.1.2 The survey data have been used to refine the position of the Order Limits and Limits of Deviation to avoid higher risk habitats for bats, such as confirmed roosts and groups of trees with high/moderate potential to support bats (as well as other ecological constraints). As such, the number of trees within the Order Limits with the potential to be affected by the proposals has been considerably reduced when compared to earlier iterations of the project (for more information see Chapter 4 Design Evolution).
- 4.1.3 This assessment has confirmed those trees within the Order Limits that have potential to support roosting bats. The presence of three roosts has also been confirmed. This assessment has also identified those habitats likely to be of high value for bats, including those with a greater likelihood of supporting rarer species (including species in Annex II of the Habitats Directive).



- 4.1.4 Construction activity has the potential to kill or injure bats in their roosts, damage or destroy roosts, or disturb bats. There is also potential for the fragmentation of linear habitats used by commuting or foraging bats.
- 4.1.5 It is currently unknown which trees would require felling. This would only be confirmed during the detailed design stage following the granting of any development consent. However, there would be an assumption that all bat roosts and trees confirmed to have high or moderate potential to support bats would be retained and protected during construction, unless the results of pre-construction surveys confirm that roosts are absent or that a licence from Natural England would be required (G174).
- 4.1.6 The contractor(s) would comply with relevant protected species legislation including with regards to bats. Appropriate licences would be obtained where necessary from Natural England for all works affecting protected species as identified by the Environmental Statement and through pre-construction surveys. All applicable works would be undertaken in accordance with the relevant mitigation requirements and conditions set out in those licences (G43).
- 4.1.7 To demonstrate that Natural England would likely grant a licence, further information with respect to likely good practice measures is provided in Appendix 7.17 Protected and Controlled Species Legislation Compliance Report. This information demonstrates that legal compliance could be achieved and that in the event that an EPSM licence is required, the favourable conservation status of a bat species would not be undermined.
- 4.1.8 Further information relating to embedded and good practice measures of relevance to bats is provided in Chapter 7 Biodiversity.

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Annex A – ArbEco Report

Southampton to London Pipeline Project

Bat Aerial Tree Assessment Results

17th December 2018

Esso Petroleum Company Ltd

© ARBECO Ltd
Unit 1 Mill Farm
Barcombe Mills Road
Barcombe
East Sussex
BN8 5BP

Telephone: +44 (0)1273 911180

info@arbeco.co.uk



Document information

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Project manager:	Dr Stephanie Murphy BSc (Hons) MSc Clara Gonzalez-Hernandez BSc (Hons) MSc
Authors Surveyors:	<p>Authors: Clara Gonzalez-Hernandez BSc (Hons) MSc Jessica Lewis BSc (Hons) MSc</p> <p>Climbing Surveyors: Brady Roberts (NE 2016-23432-CLS-CLS / NPTC L2: 100/1960/1 501388) Matt Cook (NE L3: 2015-10167-CLS-CLS / L4: 2015-10176-CLS-CLS / NPTC L2 600/6620/9 828118) Chris Long (NE L2: 2015-15643-CLS-CLS / NPTC L2 500/7750/8 CS38 550232) Jon Sydney (NPTC L2: 500/7750/8 525107) Daniel Simmons (NE 2015-15026-CLS-CLS/ NPTC L2 500/7750/8) Hannah Rodgers (NE 2015-15026-CLS-CLS/ NPTC L2 600/6620/9) Chris Agnew (CS39 A/101/7907 299399) Sam Marriot (NPTC L2 600/6620/9 890052) Sergio Diaz (NPTC L2 600/6620/9 899434)</p>
Report date:	20 th November 2018

Checked by:	Nick Deykin BSc (Hons) Senior Ecologist
Authorised by:	Dr Stephanie Murphy BSc (Hons) MSc Director



Notice to Interested Parties

To achieve the study objectives stated in this report, we were required to base our conclusions on the best information available during the period of the investigation and within the limits prescribed by our client in the agreement.

No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. Thus, we cannot guarantee that the investigations completely defined the degree or extent of e.g. species abundances or habitat management efficacy described in the report.

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1 Introduction

Arbeco Ltd were commissioned by Esso to undertake aerial inspection tree climbing surveys of trees which fall within 10m of the Order Limits of the Southampton to London Pipeline Project. This report details the results of those surveys.



2 Methods

Initial Ground-Based Bat Roost Assessment surveys (hereafter GBBRA) were carried out by Jacobs ecologists on all trees within 10m of the Order Limits, where land access permitted. These involved ground-based inspections of potential features on each tree that had suitability to support a bat roost. These surveys were used to inform aerial surveys.

Only trees which were classified as having ‘moderate’ or ‘high’ suitability to support roosting bats were subject to an aerial tree inspection, health and safety and access permitting.

Suitability roost feature inspections were undertaken by Arbeco Ltd licensed bat surveyors (Natural England) and certified tree climbers (NTPC CS38 Aerial tree climbing and rescue) throughout the months of August, September and October 2018.

The Bat Conservation Trust’s Bat Surveys for Professional Ecologists Good Practice Guidelines (Collins, 2016) and the JNCC 3rd Edition Bat Workers’ Manual (Mitchell-Jones & McLeish, 2004) were used during both the initial ground-based assessments, and during aerial inspections, in order to standardise the methodology and to ensure best practice guidance was followed.

Lifting Equipment Regulations (LOLER, 1998) certified climbing equipment was used throughout each aerial tree inspection. Equipment included specialised climbing ropes, harnesses, helmets karabiners, gloves, eye protection and suitable footwear.

The results of the ground inspection were used to plan the optimum route to access and assess the identified feature(s). During the aerial inspection features were searched using torches, mirrors and endoscopes for evidence of roosting bats, including:

- Live or dead bats;
- Droppings inside or beneath features;
- Oil or urine staining around or beneath features;
- Scratch marks around features;
- Smoothing around features;
- Audible squeaking from bats within features, particularly on warm days;
- Feeding signs within or around features e.g. moth wings; and
- Flies around feature entry points attracted by the guano.

During the aerial inspection, each feature and tree was assessed for bat roosting suitability. Where necessary, the tree’s classification (i.e. moderate or high) based on the GBBRA was reviewed and upgraded or downgraded to reflect the results of the aerial inspection, in accordance with Table 1



below, taken from The Bat Conservation Trust's Bat Surveys for Professional Ecologists Good Practice Guidelines (Collins, 2016).

Wherever possible, aerial inspections also characterised the type of bat roost that any trees with high suitability would be most likely to contain (e.g. day roost, maternity roost, transitional roost) based on the surveyor's professional judgement and experience, and the physical characteristics and the habitat immediately surrounding the tree and/ or feature with bat roost suitability. Suitability was defined according to the descriptions outlined in Table 1 below, taken from The Bat Conservation Trust's Bat Surveys for Professional Ecologists Good Practice Guidelines (Collins, 2016).

Table 1: Suitability of trees for bat roost potential (Collins, 2016)

Suitability	Description
Negligible	Negligible habitat features likely to be used by roosting bats
Low	A tree of sufficient size and age to contain potential roosting features but with none seen from the ground or features seen only with very limited roosting potential
Moderate	A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only)
High	A tree with one or more potential roost sites that are obviously suitable for use by larger number of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat
Confirmed	A tree which was found to have bats roosting within a feature during the aerial inspection survey.



3 Results

A total of 46 land parcels were visited to undertake aerial inspection surveys of trees. Within the 46 land parcels 299 trees were highlighted for an updated survey, of which a total of 263 trees were able to be surveyed. Updated surveys comprised of an aerial inspection where health and safety permitted, or inspection of features with an endoscopic camera from ground level, where aerial surveys were not possible, and the feature was close enough to the ground to be inspected. If a tree was unable to be climbed or inspected using an endoscopic camera from the ground, then trees were recommended for emergence and re-entry surveys in order to determine suitability and their ground-based classification was retained.

Of those surveyed a total of five confirmed roosts were identified, 80 trees were considered to have high suitability to support roosting bats, 89 trees were considered to have moderate suitability, 51 were considered to have low suitability and 38 were considered to have negligible suitability to support roosting bats.

In the following section the results of the aerial inspection surveys are arranged into the land parcels that were visited in geographical order from the most southern land parcel to the most northerly.

Photographs (where available) of trees with suitable roost features are provided in text. The numbers within the photographs relate to the number that was allocated to each potential roost feature present on the tree, in order to reference GBBRA results and provide an updated survey of the same feature during aerial surveys.

Table 2: Summary Table showing trees surveyed in each land parcel and the number of trees with each level of suitability to support roosting bats.

Land Parcel	Total Trees	Total H&S/ Constraints	Total updated survey	Negligible	Low	Moderate	High	Confirmed
180	3	0	3		1	1	1	
200	2	1	1	1		1		
420	4	0	4			2	2	
441	1	0	1				1	
440	1	0	1				1	
461	1	0	1			1		
22360	1	0	1		1			
681	2	2	0					
720	3	0	3			2	1	
740	7		7		1	1	5	
802	1	1	0		1			
820	1	1	0					
840	2	0	2	1			1	



Land Parcel	Total Trees	Total H&S/ Constraints	Total updated survey	Negligible	Low	Moderate	High	Confirmed
24460	3	1	2			1	1	
1050	3	0	3			2	1	
1110	6	0	6			3	3	
1340	3	0	3	1	1		1	
1210	3	0	3	2			1	
27970	11	0	11		3	4	4	
1431	5	0	5		3	2		
1970	5	1	4			1	2	1
2280	2	0	2			2		
2380	2	0	2	1		1		
2820	11	0	11		3	5	3	
3980	20	1	19	3	5	6	5	
3230	1	0	1			1		
3200	12	1	12	1	5	4	2	
4450	18	4	12	6	2	3	1	
4120	20	6	14	10	2	1	0	1
4390	8	0	8		2	4	2	
5050	6	0	6		2	4		
5960	2	0	2		1	1		
7790	9	4	7	2	1	2	2	
8000	2	0	2				2	
72180	12	2	10	2	1	4	3	
8200	3	0	3		2	1		
8850	8	3	6		2	1	3	
8940	70	7	63	7	12	18	23	3
9020	1	0	1			1		
9060	4	0	4			3	1	
9240	4	1	3		1		2	
11300	3	0	3	1	1		1	
10530	7	1	6			3	3	
10230	2	0	2			1	1	
10300	2	0	2			1	1	
12540	2	0	2			2		
Totals	299	38	263	38	51	89	80	5



a. Land Parcel 180

The area is approximately 2.8ha in size and contains a total of three trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 5th October 2018. One tree within this land parcel was considered to have low bat roost suitability (180_00329), one was considered to have moderate (180_00330) and one high (180_00331).

Tree 180_00329 was a semi-mature sweet chestnut growing between a wall and a fence. This tree had knot holes at 5m on the eastern aspect and at 2m on the south east aspect. Both features were downgraded from moderate to low suitability to support roosting bats following aerial survey as they offered limited shelter (see photograph 1 below).

Tree 180_00330 was a mature oak growing on the side of a road with a tear out on a vertical limb at 10m on the northern aspect. Aerial inspection confirmed this feature to have moderate suitability to support roosting bats; there were gaps around the heartwood from a callous with some exposed points but multiple secondary crevices and an entrance of 1-2cm wide (see photograph 2 below).

Tree 180_00331 was a group of semi-mature sweet chestnuts west of the pipeline route. A wound present at 2.5m on the northern aspect was re-classified from moderate to high suitability to support roosting bats following aerial survey. The feature had an entrance of 30cm x 1cm and led upwards 15cm in a tube shelter leading to a cone apex. Some woodlice and slugs were present, but the feature was dry and secure (see photograph 3 below).

Table 3: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 180

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
180_00329	Y	Down	Moderate	Low
180_00330	Y	No change	Moderate	Moderate
180_00331	Y	Up	Moderate	High

Survey Photographs of trees within Land Parcel 180





Photograph 1: Tree 180_00329, Land Parcel 180, 05/10/2018, standard lens.



Photograph 2: Tree 180_00330, Land Parcel 180, 05/10/2018, standard lens.



Photograph 3: Tree 180_00331, Land Parcel 180, 05/10/2018, standard lens.



b. Land Parcel 200

The area is approximately 17.6ha in size and contains a total of two trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 20th September 2018. One tree within this land parcel was considered to have moderate bat roost suitability (200_3_00546), the other was re-classified to negligible suitability (200_4_00647).

Tree 200_4_00547 was a mature oak in a hedge adjacent to an arable field. The survey recorded one woodpecker hole on the eastern aspect of the main stem at approximately 8.5m height. Further survey downgraded the tree from moderate to negligible suitability to support roosting bats due to the high quantity of heartwood present, blocking much of the hole, and lack of suitable roosting features (see photograph 4 below).

Tree 200_3_00546 was a dead tree in a hedge adjacent to an arable field. The survey recorded lifted bark on the north west aspect of the main stem at approximately 4m height that appeared to extend upwards. However, due to the unsafe condition of the tree a climbing survey was not possible, so the feature was inspected from the ground using an endoscopic camera and the tree was recommended for emergence and re-entry surveys, as a full inspection was not possible. This tree retained its original classification of moderate suitability to support roosting bats (see photograph 5 below).

Table 4: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 200

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
200_4_00547	Y	Down	Moderate	Negligible
200_3_00546	N	No change	Moderate	Moderate

Survey Photographs of trees within Land Parcel 200





Photograph 4: Tree 200_4_00547, Land Parcel 200, 20/09/2018, standard lens



Photograph 5: Tree 200_3_00546, Land Parcel 200, 20/09/2018, standard lens

c. Land Parcel 420

The area is approximately 5.2ha in size and contains a total of four trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 5th October 2018. Following the aerial assessment, a total of two trees were considered to have moderate suitability (420_00327 and 420_00326) and two were considered to have high suitability (420_00325 and 420_00328) within this land parcel.

Tree 420_00327 was a mature multi-stemmed ash by the main gate on Cross Lane with evidence of decay. The survey recorded woodpecker holes on the south east aspect of a dead limb with soft heartwood at approximately 8 metres height; further survey showed that these led back 7cm. Butt rot was observed at the base of the trunk, with an opening of 20cm by 10cm, depth of 10cm and internal cavity approximately 1.1m high with an internal diameter of 10cm. This was confirmed to have moderate suitability to support roosting bats due to being very low to the ground and obscured by vegetation (see photograph 6 below).

Tree 420_00326 was a mature multi-stemmed ash by the main gate on Cross Lane. The survey recorded a wound on the south aspect of the main stem at approximately 7m height, with a bracket fungus indicating a possible cavity. Further survey confirmed this, showing a hole of 3cm by 6cm leading down 10cm with a rotten, wet base. Overall suitability was confirmed as moderate after aerial inspection (see photograph 7 below).

Telephone : 01273 911180

info@arbeco.co.uk www.arbeco.co.uk

Arbeco, Unit 1, Mill Farm, Barcombe Mills Road, Lewes, East Sussex BN8 5BP.



Tree 420_00325 was a mature ash by the main gate on Cross Lane. The survey recorded several knot holes on the north west aspect of the main stem at approximately 1.5m height. Further surveys showed an entrance of 5cm by 3cm leading to a dry and clean 1m high cavity with a wedged apex. Survey also noted butt rot at the base of the main trunk on the west aspect; an entrance of 30cm by 60cm leading down to a depth of approximately 20cm and a height of 60cm. A possible bird nest was present at top of the domed cavity with vegetation covering the entrance. Classification of high suitability to support roosting bats was confirmed during aerial survey (see photograph 8 below).

Tree 420_00328 was a mature ash group by the main gate on Cross Lane. The survey recorded woodpecker holes on the north aspect of the main stem, and the south aspect of the right-hand tree at approximately 2.5m and 5m respectively. An aerial survey confirmed that the former lead up 20cm, and was dry, clean and smooth; the latter holes were 4cm by 3cm both going up 1m. Multiple dry, secure and sheltered chambers with coned apices were found. Overall suitability was confirmed as high after aerial inspection (see photograph 9 below).

Table 5: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 420

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
420_00327	Y	No change	Moderate	Moderate
420_00326	Y	No change	Moderate	Moderate
420_00325	Y	No change	High	High
420_00328	Y	No change	High	High

Survey Photographs of trees within Land Parcel 420

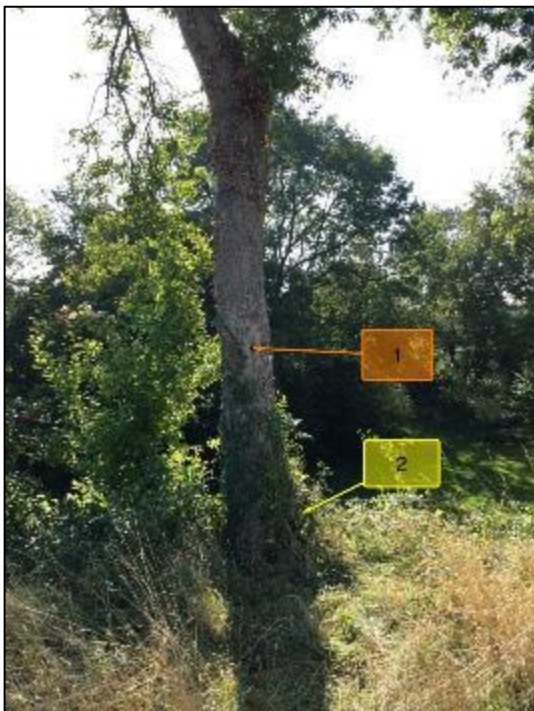




Photograph 6: Tree 420_00327, Land Parcel 420, 05/10/2018, standard lens



Photograph 7: Tree 420_00326, Land Parcel 420, 05/10/2018, standard lens



Photograph 8: Tree 420_00325, Land Parcel 420, 05/10/2018, standard lens



Photograph 9: Tree 420_00328, Land Parcel 420, 05/10/2018, standard lens



d. Land Parcel 441

The area is approximately 3.5ha in size and contains a total of one tree that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 5th October 2018. This tree was upgraded from moderate to high suitability to support roosting bats following aerial inspection.

Tree 441_7_00840 was a mature oak in hedgerow 10 metres north west of a gap in the hedgerow in a farm yard. The survey recorded a cluster of three woodpecker holes on the south west aspect of a limb at approximately 10m height. Further survey re-classified this tree from having moderate to high suitability to support roosting bats; the woodpecker holes were of 4cm diameter and lead approximately 12cm to multiple cavities back along the branch. The cavities were clean, dry, secure, smooth and contained material from a defunct squirrel drey (see photograph 10 below).

Table 6: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 410

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
441_7_00840	Y	Up	Moderate	High

Survey Photograph of tree within Land Parcel 441





Photograph 10: Tree 441_7_00840, Land Parcel 441, 05/10/2018, standard lens.

e. Land Parcel 440

The area is approximately 20.5ha in size and contains a total of one tree that was highlighted for further survey, following the initial GBBRA survey. Aerial surveys were carried out on the 29th September 2018. This tree maintained its GBBRA classification of high suitability to support roosting bats.

Tree 440_835 was a large mature ash. Survey recorded a large tear out on the south east aspect of the main stem at approximately 4m height that opens into a large cavity. Further survey revealed two dry, clean and secure cavities going up 1.5m and 0.5m respectively, both 4cm in diameter, smooth and with coned apices. This feature was confirmed as having high suitability to support roosting bats. Some ivy cover was recorded on the north aspect of the main trunk at approximately 5m height offering limited shelter and confirmed as having low suitability to support roosting bats. Overall this tree was confirmed as having high suitability to support roosting bats following aerial inspection (see photograph 11 below).

Table 7: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 440

Tree ID	Climbed (Y/N)	Re-classified? (up down)	Original Classification following GBBRA	Classification after aerial inspection



		or no change)		
440_835	Y	No change	High	High

Survey Photograph of tree within Land Parcel 440



Photograph 11: Tree 440_835, Land Parcel 440, 29/09/2018, standard lens

f. Land Parcel 461

The area is approximately 34.9ha in size and contains a total of one tree that was highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 29th September 2018. This tree maintained its original ground-based classification of moderate suitability to support roosting bats.

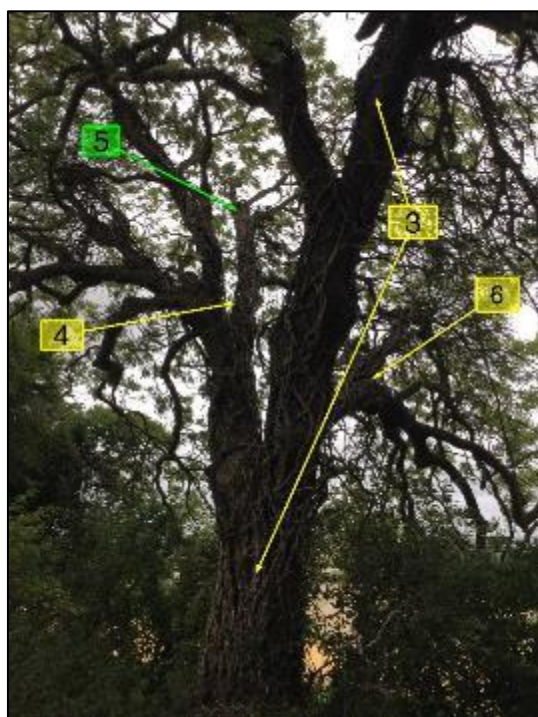
Tree 461_836 was a mature ash covered with dead ivy in the very corner of a field. Survey revealed multiple features including tear outs on the southern aspect at 5m and 6.5m respectively, knot holes on the east and south aspects at 6m, 4m and 4.5m, and dead ivy coverage on the south aspect of the main trunk from 2m height. Aerial inspection revealed broadly low or negligible suitability to support roosting bats; the ivy showed moderate suitability, with knot holes on the south side lending moderate suitability with small internal cavities in both. Overall suitability confirmed as moderate after aerial inspection (see photograph 12 below).



Table 8: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 461

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
461_836	Y	No change	Moderate	Moderate

Survey Photograph of tree within Land Parcel 461



Photograph 12: Tree 461_836, Land Parcel 461, 29/09/2018, standard lens.

g. Land Parcel 22360 & 681

The area consists of a small area of woodland close to the South Downs Way, directly north of Rooksgrove Farm and Rooksgrove Copse which straddles the access track leading north off of Wheely Down Road. The area is approximately 0.188ha in size and contains a total of three trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on 27th September 2018.

During the aerial inspection, two of the trees (tree 681_14_01804 and 681_14_untagged1) were deemed unsafe to climb, so no further survey information was obtained. Therefore, the initial



ground-based classification of moderate suitability to support roosting bats remains the overall tree grade for both. One tree was downgraded from moderate to low suitability to support roosting bats following the aerial assessment.

Tree 22360_14_01805 was a mature beech with knot holes at 3m height on the northern aspect and 4.5m height on the southern aspect. The lower knot hole was 5cm in diameter at the entrance and went 15cm back into the tree, however the hole was damp and exposed, offering low suitability for roosting bats and the higher knot hole was shallow and exposed, so considered to have negligible suitability to support roosting bats. Overall this tree was downgraded from moderate to low suitability to support roosting bats following aerial inspection (see photograph 13 below).

Tree 681_14_01804 was a mature beech growing opposite Kilmerston Barn (SO32 3LJ). The tree was considered to have moderate suitability to support roosting bats due to the presence of knot holes at 4m height on the west aspect and 11m height on the southwest aspect. The tree was deemed unsafe for climbing surveys due to it overhanging the road, so retained its original classification of moderate suitability to support roosting bats.

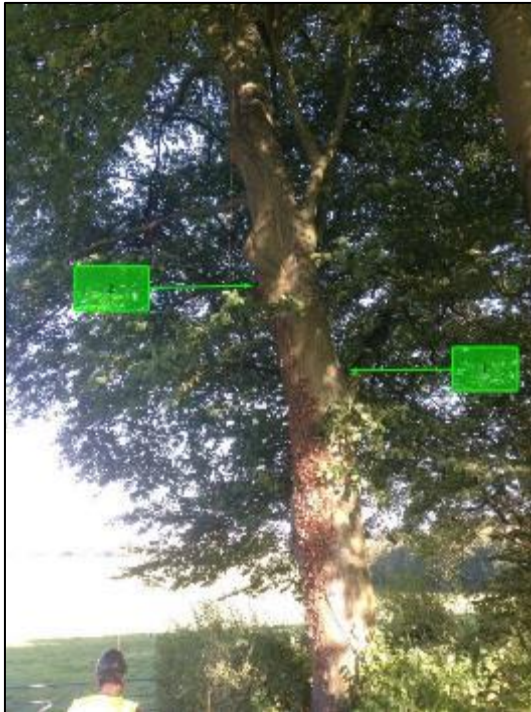
Tree 681_14_untagged1 was a mature oak within a wooded area east of the road. The tree was thought to have moderate suitability to support roosting bats and recommended for further surveys due to the presence of entry points from the north, west and south into hazard beams at 14m height on the northwest aspect. The tree was deemed unsafe for climbing surveys due to it overhanging the road, so retained its original classification of moderate suitability to support roosting bats.

Table 9: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 22360 & 681

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
22360_14_01805	Y	Down	Moderate	Low
681_14_01804	N	No change	Moderate	Moderate
681_14_untagged1	N	No change	Moderate	Moderate

Survey Photograph of tree within Land Parcel 22360





Photograph 13: Tree 22360_14_01805, Land Parcel 22360, 27/09/2018, standard lens.

h. Land Parcels 720 & 740

The area of both land parcels is approximately 125.4ha in size and contains a total of ten trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 10th September 2018.

A total of six trees within these land parcels were considered to have high suitability to support roosting bats, three were considered to have moderate suitability and one was downgraded to have low suitability to support roosting bats, within both land parcels.

Tree 740_00339 was a mature beech tree that has snapped off at 5m height. Wounds on the south aspect between 0m and 5m with rot all over, providing cavities with limited shelter. Overall suitability was re-classified from moderate to low after aerial inspection (see photograph 14 below).

Tree 740_00340 was a mature beech tree in a row after an area of woodland. Survey revealed woodpecker holes at 12m height on the south aspect of a dead limb with desiccation fissures. Aerial survey revealed fissures leading back 30cm that were bumpy, but secure; overall tree suitability was confirmed as moderate (see photograph 15 below).

Tree 720_00341 was a mature beech located at the bus stop opposite a house. Survey revealed a transverse snap on the north west aspect at 6m height with a crevice. Further survey revealed a



wedge apex at the split providing moderate shelter running 50cm to apex, open at both ends. Overall suitability confirmed as moderate after aerial inspection (see photograph 16 below).

Tree 720_00343 was a mature oak to the southern corner of a barn. Survey revealed a wound on the south aspect of a limb at approximately 5m height with low suitability due to its shallow and exposed nature with minimal shelter behind a callous roll. A 1m long wound along the eastern aspect of a branch at 6m was dry, secure and clean offering shelter behind a callous roll that runs diagonally up the branch. Overall suitability was considered to be moderate after aerial inspection (see photograph 17 below).

Tree 740_00334 was a mature beech in a row after an area of woodland. Survey revealed knot holes on the main trunk at a height of 5m. A 5cm entrance leads back 35cm with secondary crevices, a domed apex and a sheltered area. Overall suitability was upgraded from moderate to high after aerial inspection (see photograph 18 below).

Tree 740_00335 was a mature beech in a row after an area of woodland. Survey revealed a knot hole on the north aspect of the main stem at 4 m height; 12cm by 1cm entrance leading to a hollow branch cavity with multiple dry chambers over 1m in length. An upward facing knot hole on the north aspect at 5m height with a 40cm by 60cm opening leading to a large tear out on the south aspect at 6m height; the latter has a 15cm opening extending 30cm vertically with multiple dry chambers with hibernation suitability. Multiple further knot holes on the north aspect of the main trunk at approximately 16m height lead to multiple small cavities and crevices. Further wounds were found at 6 m height on the north aspect of the main trunk leading into a damaged limb leading up 40cm. Overall suitability was upgraded from moderate to high after aerial inspection (see photograph 19 below).

Tree 740_00336 was a mature beech in a row after an area of woodland. Survey revealed lifting bark on the east aspect of the main trunk at approximately 8m height extending for 2m. Wounds on the north aspect of the main trunk have exposed the heartwood at 5 m height. This was partially hollow with a cavity extending 60cm back into a secondary cavity of 30cm size. A further wound was discovered on the north west apex at 4 m height with a large cavity extending 90cm vertically with a cone apex. Both cavities showed evidence of corvid nesting. Knot holes on the north aspect of the main trunk caused by a limb tear out extends from a 7cm diameter entrance up 25cm into the main trunk. Numerous woodpecker holes were found on the east aspect at approximately 12 m height on dead limbs, however these were seen to be shallow and partly exposed. Overall suitability was confirmed as high after aerial inspection (see photograph 20 below).

Tree 740_00337 was a mature beech trees in a row after an area of woodland. Survey revealed an excavated knot hole on the south east aspect of the main trunk at approximately 4 m height extending diagonally down 40cm. Woodpecker holes at a height of 3m on the south east aspect of the main stem extended horizontally 40cm, and vertically 25cm. Overall suitability was upgraded from moderate to high after aerial inspection (see photograph 21 below).

Tree 740_00338 was a mature beech tree that has been subjected to a lightning strike that has exposed the heartwood down the eastern side. This damage has provided multiple secondary



crevices and desiccation fissures at between 4.5m and 8m height extending vertically. Overall suitability was confirmed as high after aerial inspection (see photograph 22 below).

Tree 720_00342 was a mature beech located 20m west of a bus stop. Survey revealed wounds on the north west aspect of the main trunk approximately 9 m height. Further survey revealed an entrance 3cm wide going back 15cm and extending vertically 80cm; smooth, hollowed out and tapering to a cone with nesting material at base. Knot holes were also noted on the south aspect of the main trunk at 5m height. An entrance of 2cm by 5cm led back 5cm and up 5cm into a small cavity. Overall suitability was confirmed as high after aerial inspection (see photograph 23 below).

Table 10: Summary table of changes in tree classification of suitability following aerial survey for Land Parcels 720 and 740

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
740_00339	Y	Down	Moderate	Low
720_00341	Y	No change	Moderate	Moderate
740_00340	Y	No change	Moderate	Moderate
720_00343	Y	No change	N/A	Moderate
720_00342	Y	No change	High	High
740_00336	Y	Up	Moderate	High
740_00334	Y	Up	Moderate	High
740_00335	Y	Up	Moderate	High
740_00337	Y	Up	Moderate	High
740_00338	Y	No change	High	High

Survey Photographs of trees within Land Parcels 720 and 740





Photograph 14: Tree 740_00339, Land Parcel 740, 10/09/2018, standard lens



Photograph 15: Tree 740_00340, Land Parcel 740, 10/09/2018, standard lens



Photograph 16: Tree 740_00341, Land Parcel 740, 10/09/2018, standard lens

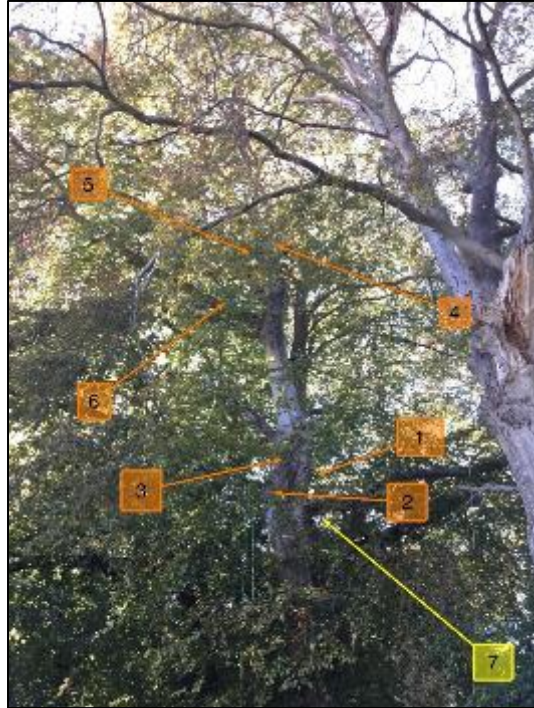


Photograph 17: Tree 740_00343, Land Parcel 740, 10/09/2018, standard lens

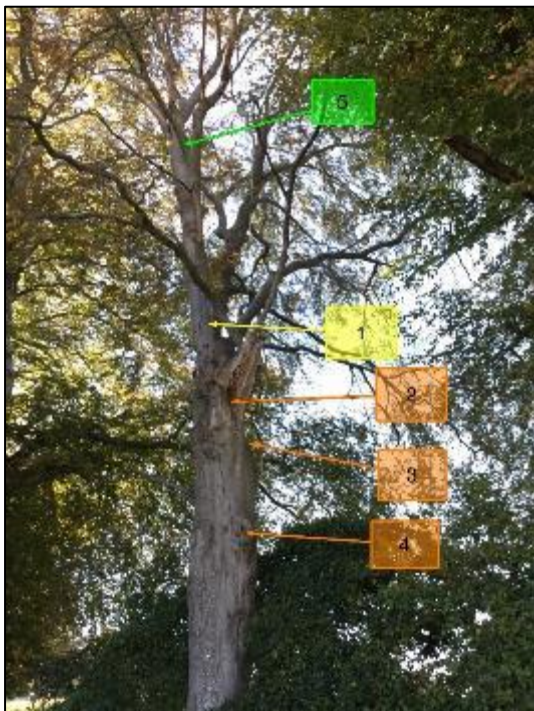




Photograph 18: Tree 740_00334, Land Parcel 740, 10/09/2018, standard lens



Photograph 19: Tree 740_00335, Land Parcel 740, 10/09/2018, standard lens



Photograph 20: Tree 740_00336, Land Parcel 740, 10/09/2018, standard lens



Photograph 21: Tree 740_00337, Land Parcel 740, 10/09/2018, standard lens





Photograph 22: Tree 740_00338, Land Parcel 740, 10/09/2018, standard lens



Photograph 23: Tree 740_00342, Land Parcel 740, 10/09/2018, standard lens

i. Land Parcel 802

The area is approximately 0.3ha in size and contains a total of one tree that was highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 20th September 2018. This tree maintained its ground-based classification of low suitability to support roosting bats.

Tree 802_28_00932 was a semi mature oak tree. Survey revealed butt rot at 0.5m height on the north west aspect containing an active bees' nest, and a callous wound at 1.8 m height on the west aspect providing limited shelter, leading in 3-4cm. Overall suitability remained as low following the aerial inspection as a closer inspection was not possible due to the active bees nest and the tree will require further survey (see photograph 24 below).

Table 11: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 802

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
802_28_00932	N	No change	Low	Low



Survey Photograph of tree within Land Parcel 802



Photograph 24: Tree 802_28_00932, Land Parcel 802, 20/09/2018

j. Land Parcel 820

The area is approximately 219.9ha in size and contains a total of one tree that was highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 20th September 2018. This tree maintained its ground-based classification of low suitability to support roosting bats following aerial survey.

Tree 820_28_00931 was a mature ash tree. Survey revealed butt rot at 0.5m height on the west aspect very low to the ground and obscured by a dead / failed stem on the ground. A failed stem had produced a cavity between 2m to 4 m height on the main trunk that was completely exposed offering minimal shelter. Overall suitability was confirmed as low after aerial inspection (see photograph 25 below).

Table 12: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 820

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection



820_28_00931	N	No change	Low	Low
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Survey Photograph of tree within Land Parcel 820



Photograph 25: Tree 820_28_00931, Land Parcel 802, 20/09/2018.

k. Land Parcel 840

The area is approximately 13.2ha in size and contains a total of two trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 20th September 2018. One of these trees (840_31_00947) was re-classified as having negligible suitability and one was confirmed as having high suitability (840_30_00942) to support roosting bats following aerial inspection.

Tree 840_31_00947 was a mature oak in a hedgerow. Survey revealed frost cracks on branches extending south and east at heights between 3m and 7m; aerial inspection re-classified this tree from moderate to negligible suitability to support roosting bats, as aerial survey revealed the frost cracks did not lead anywhere, thus offering little shelter (see photograph 26 below).

Tree 840_30_00942 was a mature beech tree on the northern edge of a wooded boundary with a field. Survey revealed wounds at 1.5m height on the north aspect of the main stem. A hole approximately 15cm by 20cm wide led upwards 60cm into a secure, dry cavity with a cone apex. Overall suitability was confirmed as high after aerial inspection (see photograph 27 below).



Table 13: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 840

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
840_31_00947	Y	Down	Moderate	Negligible
840_30_00942	Y	No change	High	High

Survey Photographs of trees within Land Parcel 840



Photograph 26: Tree 840_31_00947, Land Parcel 840, 20/09/2018, standard lens.



Photograph 27: Tree 840_30_00942, Land Parcel 840, 20/09/2018, standard lens.

I. Land Parcel 24460

The area lies north of Soame's Lane and south west from Smugglers Lane and is comprised of a large arable field bordered by hedgerows and scattered trees. The area is approximately 7.3ha in size and contains a total of three trees that were highlighted for aerial surveys, following the initial GBBRA survey. Aerial surveys were carried out on 19th September 2018.



Three trees were climbed in this land parcel, of these two were considered to have high suitability (24460_837 and 24460_839) and one was considered to have moderate suitability (24460_838) to support roosting bats.

Tree 24460_838 was a semi-mature ash tree with two features that were inspected during the aerial survey. One feature was a rotting broken branch at 7m height on the eastern aspect that upon closer inspection had negligible bat roost suitability, the other was a branch tear-out from the main trunk at 8m height on the southern aspect. This feature was considered to have moderate suitability to support roosting bats, it led upwards 5cm to a wedge apex. The hole was clean and secure, and the entrance was approximately 3x10cm. Overall this tree retained its ground-based classification of moderate suitability to support roosting bats (see photograph 28 below).

Tree 24460_837 was a mature ash tree with two trunks, one of which was broken. Two tear-out holes were assessed during aerial surveys, one at 6m height on the southern aspect had negligible suitability to support roosting bats and one at 4m height on the south west aspect opened into a large cavity with lots of crevices that offered suitable roosting locations and was considered to have high suitability for roosting bats. Overall this tree was confirmed as having high suitability to support roosting bats.

Tree 24460_839 was a mature ash covered in numerous pock marks and wounds, which appear to be the result of fungal growth within the tree. A lot of the holes appeared to lead further into the tree and there were suitable cavities up most of the length of the main stem, hence the tree was considered to have high suitability to support roosting bats. The tree was noted as being beyond the required 10m buffer either side of the proposed route, however, was highlighted for aerial inspection due to its particularly high apparent suitability.

Table 14: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 24460

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
24460_838	Y	No change	Moderate	Moderate
24460_839	N	No change	High	High
24460_837	Y	No change	High	High

Survey Photograph of tree within Land Parcel 24460





Photograph 28: Tree 24460_838, Land Parcel 24460, 19/09/2018, standard lens

m. Land Parcel 1050

The area included within land parcel 1050 is approximately 107.1ha in size and contains a total of three trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 19th September 2018. Within this land parcel, two of the trees retained their ground-based classification of moderate suitability (1050_35_01814 and 1050_35_01813), and one tree was upgraded from moderate to high suitability (1050_35_01815) to support roosting bats following aerial inspection.

Tree 1050_35_01814 was a mature oak tree on a boundary between an arable and grazing field. Survey revealed a small knot hole at 8m height on the west aspect of a limb, a small knot hole on the very end of a limb extending south at 4m height, and a knot hole on the end of a limb extending south at 5 m height with some new branch growth on the end of the limb. Overall suitability was confirmed as moderate after aerial inspection.

Tree 1050_35_01813 was a mature oak tree on a boundary between an arable and grazing field. Survey revealed a transverse snap whereby the underside of a limb has peeled away and has revealed a possible entry point into the limb at approximately 5m height. Overall suitability was confirmed as moderate after aerial inspection.

Tree 1050_35_01815 was a mature oak tree on a boundary between an arable and grazing field. Survey revealed pruning cuts that have produced a 20cm deep cavity at 7m height on the elbow of the first major branch from the trunk. Further to this, three negligible features were found including



a tear out at 8m height on the west aspect of a north facing branch approximately 15cm long, knot holes at 7m height at the end of a western facing forked branch, and a 15cm tear out at the end of a branch at 10m height on the east aspect of the trunk. Overall suitability was confirmed as high after aerial inspection.

Table 15: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 1050

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
1050_35_01815	Y	Up	Moderate	High
1050_35_01814	Y	No change	Moderate	Moderate
1050_35_01813	Y	No change	Moderate	Moderate

n. Land Parcel 1110

The area is approximately 3.5ha in size and contains a total of six trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 18th September 2018. A total of three trees within this land parcel (1110_853, 1110_854 and 1110_858) were considered to have moderate and three trees (1110_855, 1110_856 and 1110_857) were considered to have high suitability to support roosting bats following aerial surveys.

Tree 1110_853 was a mature oak. Survey revealed a broken limb at 10m height with large splits 6cm deep along its remaining length that led 80cm horizontally into the main trunk of the tree. Further to this, other tear outs have occurred at 12m height on the northwest and southeast aspects, which were found to be open and exposed and were downgraded from moderate and high respectively, to negligible suitability to support roosting bats. Small wounds have produced callousing on the underside of a branch on the north aspect of the tree at approximately 10 m height but were found to provide limited shelter. Overall suitability was re-classified from high to moderate following aerial inspection (see photograph 29 below).

Tree 1110_854 was a mature beech tree, the most northerly of a group extending along a fence. Survey revealed a tear out at 1.5m height on the west aspect of the trunk near the base that led up 25cm, and was dry, secure and sheltered. Overall suitability was confirmed as moderate following aerial inspection (see photograph 30 below).

Tree 1110_858 was a semi mature horse chestnut in the middle of a field. Survey revealed a large area where bark has been removed due to a tear out, behind which a secure and dry cavity has formed extending 4cm vertically. Bark has also lifted on the south aspect of the tree at 3m height; although suitable to support roosting bats, protection from the elements is low, and bark is likely to break off. Overall suitability was confirmed as moderate after aerial inspection (see photograph 31 below).



Tree 1110_855 was a mature dual stem beech tree, the most southerly of a group extending along a fence. Survey revealed a large tear out at 1m height on the west aspect that leads into a 60cm high chamber with a cone apex. Overall suitability was confirmed as high after aerial inspection (see photograph 32 below).

Tree 1110_856 was a mature multi stemmed beech tree. Survey revealed a large tear out at 1m height on the west aspect of the trunk that extends vertically by 60cm into a secure and dry chamber. This tree was confirmed as having high suitability to support roosting bats following aerial inspection (see photograph 33 below).

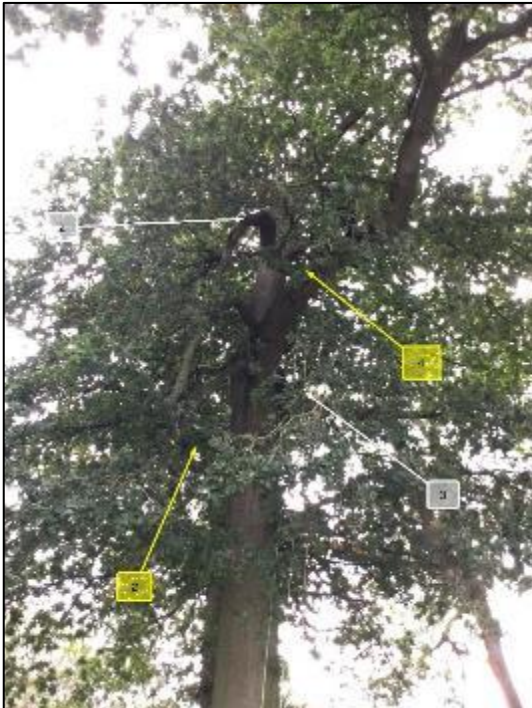
Tree 1110_857 was a mature poplar next to a fence. Survey revealed woodpecker holes at 12m height on the south aspect of a branch. The higher hole led down 90cm into a small crevice and the lower hole led down 50cm into a small crevice. A knot hole is also present at 5m height on the south aspect of the lowest branch on the trunk. Internally the hole extends 10cm into an exposed cavity offering low suitability. Overall suitability was confirmed as high after aerial inspection (see photograph 34 below).

Table 16: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 1110

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
1110_853	Y	Down	High	Moderate
1110_854	Y	No change	Moderate	Moderate
1110_858	Y	No change	Moderate	Moderate
1110_855	Y	No change	High	High
1110_856	Y	No change	High	High
1110_857	Y	No change	High	High

Survey Photographs of trees within Land Parcel 1110

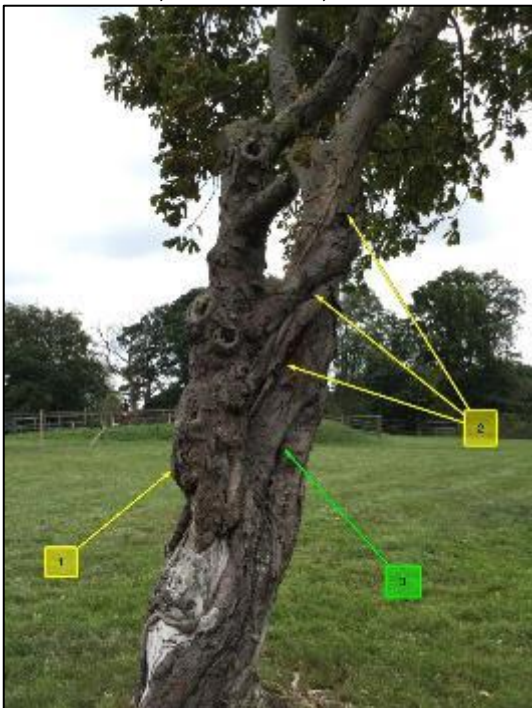




Photograph 29: Tree 1110_853, Land Parcel 1110, 18/09/2018, standard lens.



Photograph 30: Tree 1110_854, Land Parcel 1110, 18/09/2018, standard lens.



Photograph 31: Tree 1110_858, Land Parcel 1110, 18/09/2018, standard lens.



Photograph 32: Tree 1110_855, Land Parcel 1110, 18/09/2018, standard lens.





Photograph 33: Tree 1110_856, Land Parcel 1110, 18/09/2018, standard lens.



Photograph 34: Tree 1110_857, Land Parcel 1110, 18/09/2018, standard lens.

o. Land Parcel 1340

The area is approximately 33.6 ha in size and contains a total of three trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 18th September 2018.

Only one tree that was re-visited within this land parcel was considered to have high suitability to support roosting bats (1340_860), the other two had low and negligible suitability respectively (1340_881 and 1340_859).

Tree 1340_859 was a mature oak growing within a hedgerow with hazard beams at 10m on the southern aspect and a pruning cut at 7m on the northern aspect. Both features offered no shelter on closer inspection and were re-classified from moderate to negligible suitability to support roosting bats (see photograph 35 below).

Tree 1340_881 was a mature oak near a corner of woodland with multiple suitability roost features. Following aerial inspection two tear outs, one at 6m on the eastern aspect and one at 10m on the south east aspect were re-classified as having low suitability to support roosting bats as both were open and exposed. A tear out at 5m on the north east aspect was re-classified as having negligible suitability as it was completely open. Lastly, a knot hole at 8m on the western aspect was re-classified as having low suitability to support roosting bats as it offered limited shelter. Overall this tree was re-classified from moderate to low suitability to support roosting bats (see photograph 36 below).



Tree 1340_860 was a thin but mature oak growing within a hedgerow. Three knot holes were present at 9m on both the southern and northern aspect, and at 10m on the north east aspect and a tear out was present at 9m on the northern aspect. The knot hole at 9m on the southern aspect was confirmed as having moderate suitability with a wound on the top which led diagonally downwards 15cm and diagonally upwards 40cm and was dry and secure inside. The knot hole at 10m on the north east aspect was also confirmed as having moderate suitability. It led diagonally downwards 30cm into a shallow stem and was dry and secure inside. The tear out extended horizontally 1m and was 3cm wide with a chamber apex and was dry and smooth inside with some cobwebs present. This feature was re-classified as having high suitability to support roosting bats. The knot hole at 9m on the northern aspect was also re-classified as having high suitability as it was a secondary entrance leading out of the tear out, had a cone apex and numerous woodlice inside. Overall this tree was re-classified from moderate to high suitability to support roosting bats (see photograph 37 below).

Table 17: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 1340

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
1340_859	Y	Down	Moderate	Negligible
1340_881	Y	Down	Moderate	Low
1340_860	Y	Up	Moderate	High

Survey Photographs of trees within Land Parcel 1340

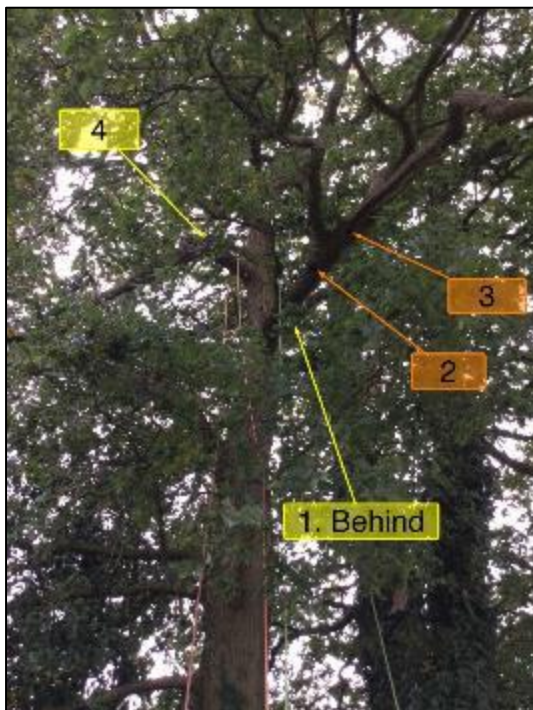




Photograph 35: Tree 1340_859, Land Parcel 1340, 18/09/2018, standard lens.



Photograph 36: Tree 1340_881, Land Parcel 1340, 18/09/2018, standard lens.



Photograph 37: Tree 1340_860, Land Parcel 1340, 18/09/2018, standard lens.



p. Land Parcel 1210

The area is approximately 227.4 ha in size and contains a total of three trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 28th September 2018. A total of two trees were re-classified as having negligible suitability (1210_00933 and 1210_00935) and one was confirmed as having high suitability (1210_00934) to support roosting bats following aerial inspections.

Tree 1210_00933 was a mature sycamore in the centre of a wooded area. Survey revealed knot holes on the north face of the main stem at 3.5 m and 7 m respectively. An aerial inspection showed them to have negligible suitability to support roosting bats, as they were upward facing and exposed. Overall suitability of this tree was downgraded from moderate to negligible suitability to support roosting bats following aerial inspection (see photograph 38 below).

Tree 1210_00935 was a mature sycamore in the centre of a wooded area. Survey revealed knot holes on the north and south aspects of the main stem at 12 m and 13 m height respectively; an aerial inspection showed them to both have negligible suitability due to them being shallow and exposed. Overall this tree was re-classified from moderate to negligible suitability to support roosting bats following aerial inspection (see photograph 39 below).

Tree 1210_00934 was a mature dual-stem sycamore in the centre of a wooded area. Survey revealed a weld on the west aspect of the main stem at approximately 2 m height with a 90cm by 2cm crack between both stems extending back 15cm with dry, sheltered crevices. This feature was confirmed as having high suitability following aerial inspection. A knot hole on the smaller stem at 4 m height was revealed to be shallow and exposed upon aerial inspection and was downgraded from moderate to negligible suitability. Overall however, this tree retained its initial overall grade of high suitability to support roosting bats (see photograph 40 below).

Table 18: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 1210

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
1210_00933	Y	Down	Moderate	Negligible
1210_00935	Y	Down	Moderate	Negligible
1210_00934	Y	No change	High	High

Survey Photographs of trees within Land Parcel 1210





Photograph 38: Tree 1210_00933, Land Parcel 1210, 28/09/2018, standard lens.



Photograph 39: Tree 1210_00935, Land Parcel 1210, 28/09/2018, standard lens.



Photograph 40: Tree 1210_00934, Land Parcel 1210, 28/09/2018, standard lens.

q. Land Parcel 27970

The area is comprised primarily of arable farmland and patches of woodland including several plantation woodlands, open woodland and a broadleaved wooded copse. Residential properties and the rural village of Upper Farringdon lie just south of this land parcel. The area is approximately 165.5 ha in size and contains a total of 16 trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on 10th October 2018.

Five trees within this land parcel that were initially marked for further surveys during ground-based surveys could not be found for climbing surveys. These included three that were thought to have low suitability to support roosting bats; a large dead oak with dense ivy covering (27970_598), a large dead conifer with multiple wounds on the main stem (27970_985) and a large dead tree of unknown species with lifted bark on the main stem (27970_588). Two trees were thought to have moderate suitability to support roosting bats; a mature field maple (27970_590) with multiple features including wounds present at 2.5m height on the northern aspect of the main stem, hazard beams located at 7m height east off the main stem and butt rot, present on the eastern aspect. The second tree with moderate bat roost suitability was a mature beech (27970_591) with a thick lattice of ivy which obscured any view of the upper branches.

Eleven trees in total were climbed within this land parcel. Of these, four were downgraded to low suitability to support roosting bats (27970_592, 27970_998, 27970_1605 and 27970_589), two were thought to have moderate suitability (27970_1000 and 27970_994), and five were classed as having high suitability to support roosting bats (27970_1602, 27970_992, 27970_996, 27970_599 and 27970_587). No confirmed bat roosts were identified within this land parcel.

Tree 27970_592 is a mature sycamore growing in open woodland with compression forks at 2m height on the southern aspect. The tree was downgraded from having moderate to low suitability to support roosting bats following the aerial inspection which revealed the compression was approximately 1cm by 40cm at the opening and went upwards 5cm. The feature offered limited shelter behind callus rolls and there were numerous slugs and woodlice at the apex (see photograph 41 below).

Tree 27970_1605 was a mature ash at the edge of an arable field and a hazel coppice woodland. The tree is thought to have moderate suitability to support roosting bats based on ground assessment results due to a thick ivy covering and welds at 7 m height on the southern aspect. Upon closer inspection these features were unsuitable for bat roosts and the tree was re-classified from high to low suitability to support roosting bats (see photograph 42 below).

Tree 27970_589 was a mature field maple at the edge of the woodland next to an arable field thought to have moderate suitability to support roosting bats based on ground assessment surveys. This was due to the present of know holes at 3 m, 4 m and 5 m height on the northern aspect, however aerial inspection revealed these were all shallow and offered limited shelter. The tree was



therefore re-classified from moderate to low suitability to support roosting bats following aerial survey (see photograph 43 below).

Tree 27970_998 was a mature ash in open broadleaved woodland adjacent to arable fields, thought to have moderate suitability to support roosting bats based on ground assessment results, which reported a large tear out hole in a knot which goes deep inside the tree. At the time of the aerial inspection, the feature on this tree was occupied by a bees' nest and the feature could be inspected. Therefore, the suitability of this tree was maintained as moderate due to the physical suitability of the feature and the possibility that the feature may be empty by next season (see photograph 44 below).

Tree 27970_1000 was a mature ash growing in open broadleaved woodland habitat, adjacent to an arable field. The survey recorded two wound holes on the northern aspect of the main stem at approximately 0.5m height. This tree was considered to have moderate suitability to support roosting bats, climbing surveys confirmed the tree as having moderate suitability to support roosting bats due to the holes being low to the ground with heavy debris in parts. Both holes were hollow with one leading upwards 1m and one leading back 90cm through a hollowed buttress root (see photograph 45 below).

Tree 27970_994 was a semi-mature sycamore at the edge of a broadleaved woodland and arable field. The tree had a single wound at approximately 2m height on the northeast aspect of the main stem. Aerial inspections confirmed this tree as having moderate suitability to support roosting bats. The wound had secondary egress at the top and was partially open, the cavity was tubular in shape and was rough, dry and clean inside (see photograph 46 below).

Tree 27970_1602 was a mature oak at the edge of an arable field, in relatively good structural condition. This tree had three features with bat roost suitability that were subject to aerial survey. Knot holes were present at approximately 3m height on the eastern aspect of the main stem. This feature was downgraded from having high to moderate suitability to support roosting bats following the aerial inspection. The hole was 20x15cm at the entrance, extended horizontally 15cm and was smooth, dry, polished and clean but with some small mammal nesting material in the base. The other two features were both at approximately 4m height; a transverse snap 0.5m in length on the western aspect and pruning cuts on the northern aspect, both off the main stem. The transverse snap was downgraded from having high to low suitability to support roosting bats following the aerial inspection as it was a loose bark plate which was mostly open and exposed, offering minimal shelter for roosting bats. The final feature remained as having moderate suitability and was described as splintered heartwood from a pruning cut. The gap is 3cm wide at the entrance and goes diagonally downwards 30cm, internally it was secure, dry, smooth and partly open. Overall this tree was re-classified from high to moderate potential to support roosting bats following aerial inspection (see photograph 47 below).

Tree 27970_992 was a mature ash situated in open woodland with one large woodpecker hole at 3.5m height on the southeast aspect. The aerial inspection revealed the hole had high suitability to support roosting bats; it was dry inside, extended upwards 15cm with a wedge-shaped apex and



an entrance of approximately 7cm by 8cm. Overall this tree was re-classified from moderate to high suitability to support roosting bats following aerial inspection (see photograph 48 below).

Tree 27970_996 was a mature sycamore in open broadleaved woodland adjacent to arable fields. The tree had a large tear out feature at approximately 3m height on the southern aspect. The feature was considered to have high suitability to support roosting bats following the aerial inspection due to the finding of woodlice at the conical apex, which was 25cm upwards from the entrance. The entrance was 3cm by 7cm and the hole was dry and clean with minimal debris inside. Overall this tree was re-classified from moderate to high suitability to support roosting bats following aerial inspection (see photograph 49 below).

Tree 27970_599 was a mature sycamore growing adjacent to a track leading to Manor Farm (GU34 3EE). Two compression holes located at 1.7m height on the eastern aspect of the main stem had high suitability to support roosting bats. The higher hole was slimy, led upwards 50cm and back 8cm with a conical apex, the hole was also smooth and secure inside. The lower hole had similar characteristics but was much cleaner inside and only led upwards 25 cm. Due to these features the tree was confirmed as highly suitable to support roosting bats following aerial inspection (see photograph 50 below).

Tree 27970_587 was a dead oak leaning against a mature beech. The tree appears to have fallen over recently as there were still leaves attached at the time of survey. Three features on the western aspect were thought to have low bat roost suitability; hazard beams at 4m height, knot holes at 3.5m height and impact shatters at 6m height. One feature, numerous lifted bark plates, which were present from 3m to 6m on the western aspect were thought to have enough gaps and shelter to have high suitability to support roosting bats. This tree was re-classified from moderate to high suitability to support roosting bats following aerial inspection (see photograph 51 below).

Table 19: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 27970

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
27970_592	Y	Down	Moderate	Low
27970_1605	Y	Down	High	Low
27970_589	Y	Down	Moderate	Low
27970_998	Y	No change	Moderate	Moderate
27970_1000	Y	No change	Moderate	Moderate
27970_994	Y	No change	Moderate	Moderate
27970_1602	Y	Down	High	Moderate
27970_992	Y	Up	Moderate	High
27970_996	Y	Up	Moderate	High
27970_599	Y	No change	High	High



27970_587	Y	Up	Moderate	High
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Survey Photographs of trees within Land Parcel 27970

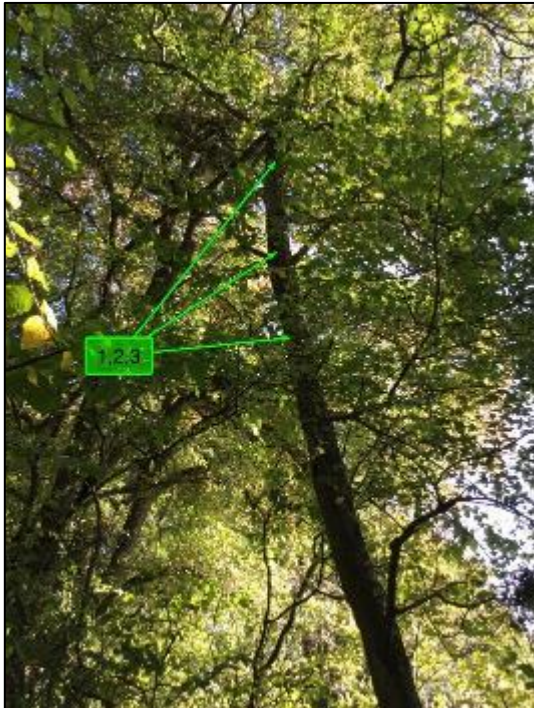


Photograph 41: Tree 27970_592, Land Parcel 27970, 10/10/2018, standard lens.



Photograph 42: Tree 27970_1605, Land Parcel 27970, 10/10/2018, standard lens.





Photograph 43: Tree 27970_589, Land Parcel 27970, 10/10/2018, standard lens.



Photograph 44: Tree 27970_998, Land Parcel 27970, 10/10/2018, standard lens.

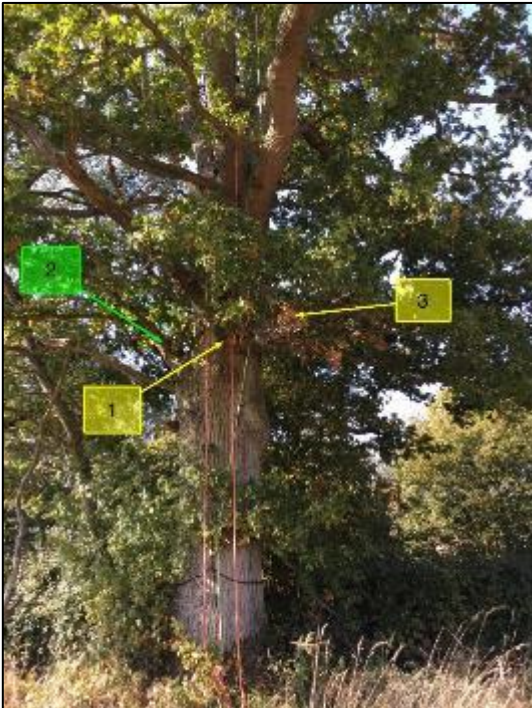


Photograph 45: Tree 27970_1000, Land Parcel 27970, 10/10/2018, standard lens.



Photograph 46: Tree 27970_994, Land Parcel 27970, 10/10/2018, standard lens.





Photograph 47: Tree 27970_1602, Land Parcel 27970, 10/10/2018, standard lens.



Photograph 48: Tree 27970_992, Land Parcel 27970, 10/10/2018, standard lens.



Photograph 49: Tree 27970_996, Land Parcel 27970, 10/10/2018, standard lens.



Photograph 50: Tree 27970_599, Land Parcel 27970, 10/10/2018, standard lens.





Photograph 51: Tree 27970_587, Land Parcel 27970, 10/10/2018, standard lens.

r. Land Parcel 1431

The area is approximately 57.5 ha in size and contains a total of five trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 19th September 2018. A total of five trees were subject to aerial inspection; three trees were downgraded from moderate to low suitability (1431_1612, 1431_1611 and 1431_596) to support roosting bats, one was confirmed as having moderate suitability (1431_597) to support roosting bats and one was downgraded from high to moderate suitability (1431_595) to support roosting bats.

Tree 1431_1612 was a mature field maple within a boundary hedgerow dividing two fields. Wounds at 4.5m on the south east and a hazard beam at 5m on the south west aspect were both downgraded from moderate to low bat roost suitability following aerial inspections as they offered limited shelter (see photograph 52).

Tree 1431_1611 was a semi-mature field maple growing in a clump of trees within a hedgerow. Compression forks on the north west aspect and a wound on the northern aspect were both present at 2.5m height. Both were re-classified from moderate to low suitability to support roosting bats following aerial survey, as they offered very limited shelter (see photograph 53).

Tree 1431_596 was a mature field maple with a wound at 2m on the north east aspect running along the main stem. This feature was re-classified from moderate to low suitability to support



roosting bats following aerial inspection at is led into an open top and was very exposed, offering limited shelter (see photograph 54).

Tree 1431_597 was a semi-mature field maple with a wound at 2m on the northern aspect of the main stem that led upwards 15cm with a few slugs at the apex. This tree was confirmed as having moderate suitability to support roosting bats following aerial inspection (see photograph 55).

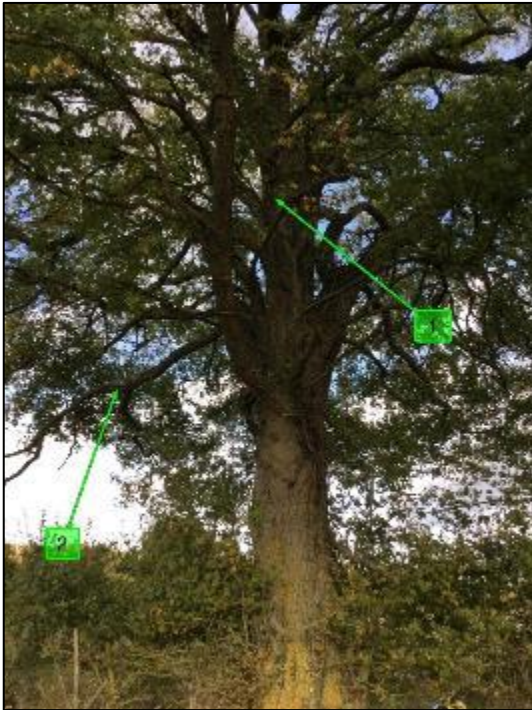
Tree 1431_595 was a mature beech with multiple suitability roost features that were subject to aerial survey. A tear out at 5m on the south east aspect was downgraded from high to negligible suitability as it was open and offered limited shelter. Two woodpecker holes were located at 3m on the western aspect, one was revealed to be a test hole with low suitability and the other was confirmed as having moderate suitability at is ed back 10cm into the tree. A tear out at 4m on the south east aspect was considered to have moderate suitability to support roosting bats as it led upwards 6cm with shelter behind the cambium. Overall this tree was re-classified from high to moderate suitability to support roosting bats (see photograph 56).

Table 20: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 1431

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
1431_1612	Y	Down	Moderate	Low
1431_1611	Y	Down	Moderate	Low
1431_596	Y	Down	Moderate	Low
1431_597	Y	No change	Moderate	Moderate
1431_595	Y	Down	High	Moderate

Survey Photographs of trees within Land Parcel 1431





Photograph 52: Tree 1431_1612, Land Parcel 1431, 19/09/2018, standard lens.



Photograph 53: Tree 1431_1611, Land Parcel 1431, 19/09/2018, standard lens.

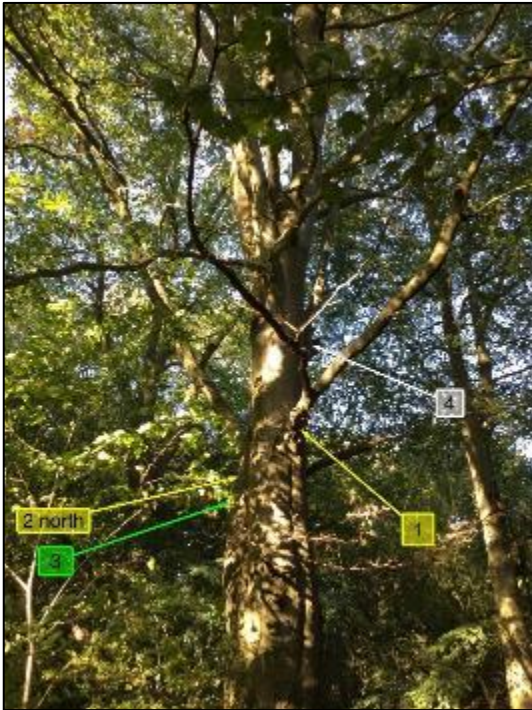


Photograph 54: Tree 1431_596, Land Parcel 1431, 19/09/2018, standard lens.



Photograph 55: Tree 1431_597, Land Parcel 1431, 19/09/2018, standard lens.





Photograph 56: Tree 2431_595, Land Parcel 1431, 19/09/2018, standard lens.

s. Land Parcel 1970

The area is approximately 4.9 ha in size and contains a total of fourteen trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 19th September 2018.

A total of nine trees were not revisited during aerial surveys (1970_00825, 1970_00824, 1970_00823, 1970_00822, 1970_00821, 1970_00819, 1970_00818, 1970_00817 and 1970_64_1). These were all mature poplar trees, many with hollow main stems and all nine were considered to have low bat roost suitability based on ground-assessments. Of the five remaining trees within this land parcel, one was confirmed to have moderate suitability (1970_64_00884), two trees were confirmed to have high suitability (1970_64_00886 and 1970_64_887), another was unsafe to climb but considered to have high suitability (1970_00820_2) and one with high suitability was confirmed as a roost tree during emergence and re-entry surveys (1970_64_00885).

Tree 1970_64_00884 was a mature poplar with a hollow trunk and three suitability roost features that were subject to aerial survey. Butt rot was present on the western aspect that was re-classified as having low suitability to support roosting bats, following the discovery that it did not extend very far up the stem. A knot hole present at 2.5m on the western aspect was re-classified from low to moderate suitability as there were secondary crevices and the hole led horizontally, downwards and 7cm backwards with a second knot hole beneath which was dirty and had debris and nesting material inside. A canker present at 3.5m on the western aspect was confirmed as having moderate



suitability to support roosting bats as it led into the hollow stem and extended 2m up into the tree with several egress points. The hole was open at the top so exposed to the elements, however, was polished smooth, clean and dry inside with secondary crevices. Overall this tree retained its initial ground-based classification of moderate suitability to support roosting bats (see photograph 57).

Tree 1970_00820_2 was a mature poplar with knot holes at 1 m and 1.5 m on the northern aspect that led into a hollow trunk, and a pruning cut at 6m on the northern aspect leading into the hollow trunk. Fruiting fungal bodies and numerous dead and decaying branches meant that this tree was not climbed due to health and safety reasons. The features were considered to have high suitability to support roosting bats based on ground-assessment, so this tree was recommended for emergence and re-entry surveys (see photograph 58).

Tree 1970_64_00886 was a mature poplar species with cankers present at 4m on the southern aspect and a knot hole in the middle of the stem. The stem was hollow, leading upward 2m to the top of the tree, getting increasingly narrower until 10cm wide and extended down 1m. Secondary access points were present as well as several secondary crevices. Inside the stem was very dry, smooth and secure. This feature was re-classified from moderate to high suitability following aerial inspection and the tree was recommended for emergence and re-entry surveys (see photograph 59).

Tree 1970_64_00887 was a mature poplar with two pruning cuts at 2m on the southern aspect. This tree was re-classified from moderate to high bat roost suitability following aerial inspection. The cuts went backwards 25cm and upwards 30cm into the trunk with a chambered apex. Internally they were dry, clean and smooth (see photograph 60).

Tree 1970_64_00885 was a mature poplar species that could not be fully inspected during aerial surveys as the trunk was not stable at the top so was recommended for emergence and re-entry surveys. As much as possible the tree was inspected using an endoscopic camera. Cankers were present at 3.5m on the western aspect and at 5m on the north east aspect. The western canker lead into the hollow stem and extended most of the length of the tree with several egress points including from the canker on the north east aspect and numerous secondary crevices present. The feature was open at the top and exposed to the elements, however, inside was polished smooth, dry and clean. These features were re-classified from moderate to high suitability to support roosting bats following aerial inspection and emergence and re-entry surveys later confirmed this tree to be a roost tree (see photograph 61).

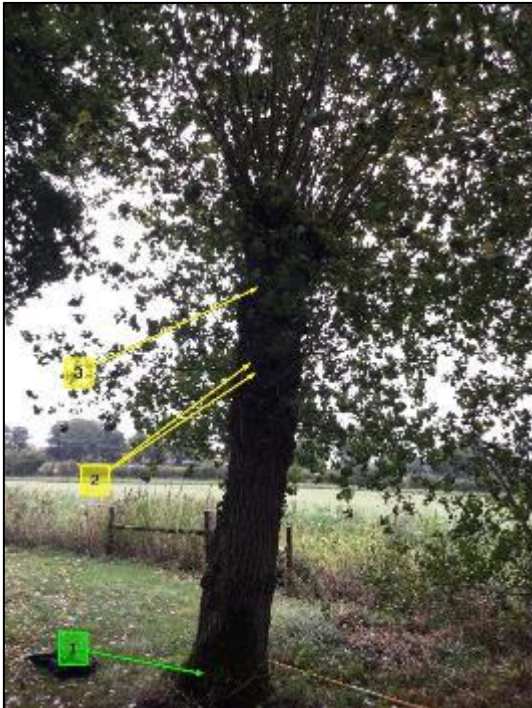
Table 21: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 1970

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
1970_64_00884	Y	No change	Moderate	Moderate



1970_00820_2	N	No change	High	High
1970_64_00886	Y	Up	Moderate	High
1970_64_00887	Y	Up	Moderate	High
1970_00885	N	Up	Moderate	High/ Later confirmed

Survey Photographs of trees within Land Parcel 1970



Photograph 57: Tree 1970_64_00884, Land Parcel 1970, 19/09/2018, standard lens.



Photograph 58: Tree 1970_00820_2, Land Parcel 1970, 19/09/2018, standard lens.





Photograph 59: Tree 1970_64_00886, Land Parcel 1970, 19/09/2018, standard lens.



Photograph 60: Tree 1970_64_00887, Land Parcel 1970, 19/09/2018, standard lens.



Photograph 61: Tree 1970_64_00885, Land Parcel 1970, 19/09/2018, standard lens.



t. Land Parcel 2280

The area is approximately 54.6 ha in size and contains a total of two trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 2nd October 2018. Both trees were confirmed as having moderate suitability (2280_68_971 and 2280_68_970) to support roosting bats following aerial inspection.

Tree 2280_68_971 was a mature ash with a canker present at 1.5m on the northern aspect. There was a small cavity that led backwards 10cm and was smooth and dry with a few woodlice present. This tree was confirmed as having moderate suitability to support roosting bats following aerial inspection (see photograph 62).

Tree 2280_68_970 was a mature ash with butt-rot extending from ground level up into the tree. The hole led upwards 40cm, was chambered, clean, smooth and dry with cone apexes. Although low to the ground this was considered to be a good feature for roosting bats and aerial survey confirmed this tree as having moderate suitability to support roosting bats (see photograph 63).

Table 22: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 2280

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
2280_68_971	Y	No change	Moderate	Moderate
2280_68_970	Y	No change	Moderate	Moderate

Survey Photographs of trees within Land Parcel 2280





Photograph 62: Tree 2280_68_971, Land Parcel 2280, 02/10/2018, standard lens.



Photograph 63: Tree 2280_68_970, Land Parcel 2280, 02/10/2018, standard lens.

u. Land Parcel 2380

The area is approximately 10.7 ha in size and contains a total of two trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 2nd October 2018. One tree was downgraded from moderate to low suitability (2380_00163) and one was confirmed as having moderate suitability (2380_00162) to support roosting bats following aerial inspection.

Tree 2380_00163 was a mature oak with a transverse snap at 5m on the southern aspect and a woodpecker hole at 5m on the eastern aspect. Both features were re-classified as having negligible suitability to support roosting bats following aerial inspection as they were found to be open and exposed, offering little shelter (see photograph 64).

Tree 2380_00162 was a mature oak with a tear out at 5m on the norther aspect that was re-classified from moderate to having negligible suitability to support roosting bats as it was open and exposed. A compression fork was also present at 9m on the southern aspect that split into two with a cavity at the base of the fork in the branch. The cavity had an entrance of 2cm and led backwards 10cm with a dome apex and was smooth and dry inside. This feature was confirmed as having moderate suitability and the tree retained its ground-based classification of moderate suitability to support roosting bats (see photograph 65).



Table 23: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 2380

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
2380_00163	Y	Down	Moderate	Negligible
2380_00162	Y	No change	Moderate	Moderate

Survey Photographs of trees within Land Parcel 2380



Photograph 64: Tree 2380_00163, Land Parcel 2380, 02/10/2018, standard lens.



Photograph 65: Tree 2380_00162, Land Parcel 2280, 02/10/2018, standard lens.



v. Land Parcel 2820

The area is approximately 34.1 ha in size and contains a total of fourteen trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 3rd October 2018.

A total of 11 trees were climbed within this land parcel, a total of three were confirmed to have low suitability (2820_00928, 2820_00929 and 2820_01963), five were confirmed to have moderate suitability (2820_00920, 2820_01681, 2820_74_00944, 2820_00919 and 2820_00932) and three were confirmed to have high suitability to support roosting bats (2820_00195, 2820_00930 and 2820_00931). No confirmed roosts were discovered within this land parcel.

Tree 2820_00928 was a mature oak growing within a wooded copse. Two woodpecker holes were present at 9m and 11m on the north east and north west aspects respectively but were found to offer limited shelter. Following aerial survey this tree was re-classified from high to low suitability to support roosting bats (see photograph 66).

Tree 2820_00929 was a mature oak with a hazard beam at 11m on the north west aspect that was re-classified from moderate to low suitability to support roosting bats following aerial survey as it offered limited shelter and was mostly upward facing (see photograph 67).

Tree 2820_01963 was a mature oak with a hazard beam at 11m on the north west aspect. This tree was re-classified from moderate to low suitability to support roosting bats following aerial inspection as the feature offered limited shelter (see photograph 68).

Tree 2820_00920 was a mature oak with two wounds at 6m on the north east and north west aspect. Both holes were 30cm long with a cavity at the top and a wedge apex, the holes joined together internally, a few cobwebs were present, and the surface was slightly rough. Aerial survey confirmed this tree to have moderate suitability to support roosting bats (see photograph 69).

Tree 2820_01681 was a mature oak with a small hole between welds on 2 limbs that extended into a cavity. Aerial survey confirmed this feature to have moderate suitability to support roosting bats. It had an entrance of 2cm by 8cm, led upwards into a wedge apex and was smooth, dry, clean and secure internally (see photograph 70).

Tree 2820_74_00944 was a partially dead oak at the woodland edge. Lifted bark was present at 5m on the eastern aspect but was re-classified as having low suitability to support roosting bats as it was open and exposed. A large lifted bark plate was also present at 3m on the western aspect that was 20cm by 40cm and partially exposed but did offer some shelter. This tree was re-classified from high to moderate suitability to support roosting bats (see photograph 71).

Tree 2820_00919 was a mature oak with an old pruning cut present at 4m on the southern aspect. There was a cavity around the heartwood that was secure and sheltered, it led horizontally 15cm into a wedge apex and internally it was damp but smooth and clean with a few slug's present. This tree was confirmed as having moderate suitability to support a low number of roosting bats following aerial inspection (see photograph 72).



Tree 2820_00932 was a mature oak growing within a wooded copse. A woodpecker hole was present at 4.5m on the north east aspect that was confirmed as having moderate suitability to support roosting bats following aerial survey. The hole was 5cm in diameter at the entrance and lead up and backwards 20cm into a domed apex. Internally the hole was dry, dusty and secure (see photograph 73).

Tree 2820_00195 was a mature oak with three features that were highlighted for aerial survey. Lifted bark at 3m on the south west aspect was confirmed to have low suitability to support roosting bats, while a large tear out at 4m on the southern, extending to 4.5m on the north west aspect, led upwards 10cm to 15cm with an entrance of 7cm and a cone apex and was smooth and dry inside was re-classified as having high suitability to support roosting bats. Overall this tree was re-classified from moderate to high suitability to support roosting bats following aerial inspection (see photograph 74).

Tree 2820_00930 was a mature ash growing within a wooded copse. Aerial survey confirmed this tree as having high suitability to support roosting bats due to a woodpecker hole present at 10m on the south east aspect that led upwards 25cm into a dome apex and was secure and sheltered but partly damp inside (see photograph 75).

Tree 2820_00931 was a mature oak growing within a wooded copse. Woodpecker holes were present at 7m on the north east aspect, however aerial survey re-classified this feature as having low suitability due to it being completely open and exposed from above. A knot hole present at 7m on the eastern aspect was re-classified as having high suitability to support roosting bats; it led 30cm horizontally towards the stem with a cone apex and was dry with a bumpy surface and secure. Overall this tree was confirmed as having high suitability to support roosting bats following aerial inspection (see photograph 76).

Table 24: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 2820

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
2820_00928	Y	Down	High	Low
2820_00929	Y	Down	Moderate	Low
2820_01963	Y	Down	Moderate	Low
2820_00920	Y	No change	Moderate	Moderate
2820_01681	Y	No change	Moderate	Moderate
2820_74_00944	Y	Down	High	Moderate
2820_00919	Y	No change	Moderate	Moderate
2820_00932	Y	No change	Moderate	Moderate
2820_00195	Y	Up	Moderate	High
2820_00930	Y	No change	High	High



2820_00931	Y	No change	High	High
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Survey Photographs of trees within Land Parcel 2820



Photograph 66: Tree 2820_00928, Land Parcel 2820, 03/10/2018, standard lens.



Photograph 67: Tree 2820_00929, Land Parcel 2820, 03/10/2018, standard lens.





Photograph 68: Tree 2820_01963, Land Parcel 2820, 03/10/2018, standard lens.



Photograph 69: Tree 2820_00920, Land Parcel 2820, 03/10/2018, standard lens.



Photograph 70: Tree 2820_01681, Land Parcel 2820, 03/10/2018, standard lens.



Photograph 71: Tree 2820_74_00944, Land Parcel 2820, 03/10/2018, standard lens.





Photograph 72: Tree 2820_00919, Land Parcel 2820, 03/10/2018, standard lens.



Photograph 73: Tree 2820_00932, Land Parcel 2820, 03/10/2018, standard lens.



Photograph 74: Tree 2820_00195, Land Parcel 2820, 03/10/2018, standard lens.



Photograph 75: Tree 2820_00930, Land Parcel 2820, 03/10/2018, standard lens.





Photograph 76: Tree 2820_00931,
Land Parcel 2820, 03/10/2018, standard
lens.

w. Land Parcel 3980

The area is approximately 35.6 ha in size and contains a total of twenty-eight trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 13th September 2018.

Of the twenty-eight trees that were highlighted for aerial survey eight trees were not able to be re-assessed during aerial surveys due to time constraints. These included five mature oak trees considered to have moderate suitability (3980_1636, 3980_1632, 3980_86_00206, 3980_86_00801 and 3980_1631), one dead oak considered to have moderate suitability (3980_1633) a semi-mature hawthorn (3980_1617) considered to have moderate suitability and one mature oak (3980_1635) considered to have high suitability to support roosting bats.

A total of three trees were downgraded from moderate to negligible suitability (3980_1625, 3980_87_01877 and 3980_86_00048), five trees were downgraded from moderate to low suitability (3980_1616, 3980_1620, 3980_1621, 3980_1622 and 3980_86_00802), six trees retained their ground-based classification of moderate suitability (3980_1618, 3980_1623, 3980_1626, 3980_1619, 3980_1628 and 3980_1629), one tree was upgraded from moderate to high suitability (3980_1624) and five trees retained their original classification of high suitability (3980_88_01879, 3980_1627, 3980_1634, 3980_00803, and 3980_1630) to support roosting bats following aerial survey.



Tree 3980_1625 was a mature oak with impact shatters at 5m height on the northern aspect that was found to be a shadow rather than a hole, therefore this tree was re-classified from moderate to negligible suitability to support roosting bats following aerial inspection (see photograph 77 below).

Tree 3980_87_01877 was a mature oak with a frost crack at 10m on the south west aspect that was found to be a blue tit *Cyanistes caeruleus* nest. This tree was downgraded from moderate to negligible suitability to support roosting bats following aerial inspection (see photograph 78 below).

Tree 3980_86_00048 was a mature oak with multiple suitability roost features including; two tear outs at 6m on the southwest aspect, wounds at 4m on the southern aspect and a tear out at 12m on the eastern aspect which were all downgraded from moderate to negligible suitability to support roosting bats following aerial inspection as they were found to be open and exposed, offering little shelter (see photograph 79 below).

Tree 3980_1616 was a mature oak with a wound present at 8m on the southern aspect that was found to lead back only 4cm, was exposed and filled with debris during the aerial inspection. This tree was downgraded from moderate to low bat roost suitability (see photograph 80 below).

Tree 3980_1620 was a mature hawthorn with knot holes and a hazard beam, both at 1m height on the eastern aspect. These features were both downgraded from moderate to low bat roost suitability as the knot hole was exposed and open from the top with a lot of debris inside, and the hazard beam was found to lead into the main stem offering little shelter. Overall this tree was re-classified from moderate to low suitability to support roosting bats following aerial inspection (see photograph 81 below).

Tree 3980_1621 was a semi-mature hazel coppice with a few large stems. A damaged hollowed out branch was present at 2.5m just north off the main stem, it had an entrance of 2cm and led upwards 30cm but tapered very early on into a tight apex and was exposed from the top. This tree was downgraded from moderate to low suitability to support roosting bats following aerial inspection (see photograph 82 below).

Tree 3980_1622 was a mature field maple with three suitability roost features that were subject to aerial survey. Two knot holes were present at 4m height on the north east aspect that were both open and shallow offering negligible bat roost suitability, and thick stemmed ivy was present at approximately 1m height on the northern aspect that had some lifted suitability but did not form any large plates. This tree was re-classified from moderate to low suitability to support roosting bats following aerial inspection (see photograph 83 below).

Tree 3980_86_00802 was a mature oak with two suitability roost features that were subject to aerial inspection including a knot hole at 5m and frost cracks at 12m. The frost crack at 12m was confirmed as having low suitability while the knot hole was found to be shallow and exposed offering limited shelter. Overall this tree was re-classified from moderate to low suitability to support roosting bats following aerial inspection. (see photograph 84 below).

Tree 3980_1618 was a very large mature field maple with a tear out at 5m on the northern aspect that had an entrance of 3cm by 5cm and led upwards 10cm with a wedge apex and a rough surface.



This tree was confirmed to have moderate suitability to support roosting bats following aerial inspection (see photograph 85 below).

Tree 3980_1623 was a dead falling hawthorn that was covered in ivy. A large, deep wound was present at 1.5m height on the eastern aspect that lead upwards 35cm to 40cm and was smooth, dry, clean and secure inside. This was considered an excellent bat roost feature, however the environment immediately surrounding the tree was very cluttered. Therefore, this tree was considered to have moderate suitability to support roosting bats overall (see photograph 86 below).

Tree 3980_1626 was a dead tree of unknown species that was mostly hollow in its' upper sections, with a wound present at 1.5m height on the northern aspect that was considered to have moderate suitability to support roosting bats. The hole was 10cm by 15cm, extended upwards 15cm and was clean and smooth inside with some woodlice, slugs and moths present. Overall this tree was confirmed as having moderate suitability to support roosting bats following aerial inspection (see photograph 87 below).

Tree 3980_1619 was a large mature oak with a knot hole at 3.5m height on the southern aspect that was downgraded to low suitability, and a hazard beam at 10m on the south east aspect. This feature was considered to have moderate suitability to support roosting bats with an entrance of 40cm by 5cm. This feature had recently split at the time of survey and was still rough. There was a secure wedge apex at both ends and although partly exposed, offered some shelter. Overall this tree was confirmed to have moderate suitability to support roosting bats following aerial inspection (see photograph 88 below).

Tree 3980_1628 was a mature oak with ivy covering much of the main trunk. Four suitability roost features were highlighted for aerial survey. A diagonal branch tear out at 14m on the northern aspect was downgraded to negligible suitability as it was exposed and offered limited shelter, and an impact shatter at 8m on the southern aspect with a 5cm callous roll offering limited shelter was downgraded to low suitability. Two features were considered to have moderate suitability to support roosting bats; an impact shatter at 8m on the southern aspect with a woodpecker hole that extended 20cm horizontally along the branch, was dry and mostly clear with some cobwebs, and a tear out at 16m on the south east aspect that extended upwards 8cm with some heartwood providing shelter within the limb tear. Overall this tree was confirmed to have moderate suitability to support roosting bats following aerial inspection (see photograph 89 below).

Tree 3980_1629 was a mature oak with multiple suitability roost features that were subject to aerial survey. A woodpecker test hole at 8m was considered to have negligible suitability and three features including; ivy covering on the trunk and two impact shatters at 10m height, were considered to have low suitability to support roosting bats. A hazard beam was present at 10m on the northern aspect that was on a dead branch with the feature facing out east and west. The entrance was 35x5cm with an internal width of 15cm going away from the stem. The hole tapered into a wedge and was clean, dry, smooth and secure and sheltered. Overall this tree was confirmed to have moderate suitability to support roosting bats following aerial inspection (see photograph 90 below).

Tree 3980_88_01879 was a mature oak situated directly over the pipeline route. This tree was not climbed due to health and safety reasons however, had multiple suitable roost features primarily



on lower limbs between 1.5m to 4m. Some of the features were inspected with an endoscope from ground level. A woodpecker hole at 1.5m height on the eastern aspect was found to extend around 40cm almost vertically into the tree and had an entrance of 5cm diameter and extended into a wedged apex. Internally the hole was secure, dry, smooth and clean offering shelter. This tree was confirmed to have high suitability to support roosting bats following secondary inspection (see photograph 91 below).

Tree 3980_1627 was a mature hawthorn close to a holly thicket with multiple suitability roost features. Impact shatters at 5m on the southern aspect were downgraded to negligible suitability, a woodpecker hole at 5m on the northern aspect which was found to be a test hole and a pruning cut at 5m on the south east aspect were both downgraded to low bat roost suitability. Three features were identified with moderate suitability to support roosting bats all at 5m height: a hazard beam on the eastern aspect that extended inwards 10cm, a tear out on the northern aspect with a top cavity that extended upwards 10cm and numerous other cavities below that were all open, and a tear out further along the same branch with a 2cm by 4cm entrance that extended inwards 5cm and was clean and dry inside. A tear out was present at 5m on the north west aspect with an entrance of 5cm by 3cm that faced south east, the hole extended upwards 70cm into a domed apex and was smooth, clean, sheltered and secure inside. This feature was considered to have high suitability and overall the tree was confirmed to have high suitability to support roosting bats following aerial inspection (see photographs 92 below).

Tree 3980_1624 was a mature ash with two main stems and other spiralling branches. An impact shatter at 5m on the northern aspect was downgraded to low suitability following aerial survey as it was found to have an open cavity. A tear out was also present at 2.5m on the northern aspect that had a diameter of 8cm at the top entrance and extended downwards 30cm. The bottom entrance was 5cm by 30cm, extended 35cm along the branch and was clean, dry and smooth inside. This tree was upgraded from moderate to high suitability to support roosting bats following aerial inspection (see photographs 93 and 94 below).

Tree 3980_1634 was a mature oak with multiple suitability roost features and was considered to have high suitability to support roosting bats. Four features were downgraded to low suitability; a woodpecker hole at 2.5m on the northern aspect found to be a test hole, a tear out at 6m on the northern aspect, a knot hole that was a large open cavity more suitable for birds and a hole under a branch at 4m on the south east aspect that was found to offer very limited shelter. A knot hole at 2.5m on the northern aspect had a piece of heartwood still inside but extended inwards with an internal width of 3cm and an entrance of 15cm by 7cm was considered to have moderate suitability to support roosting bats. Two wounds were present at 4m on branches about 4m from the main trunk on the south east aspect with an entrance of 7cm diameter that extended diagonally inwards towards the stem. The wounds had an internal width of 5cm narrowing into a spire and were approximately 40cm long. Internally the wounds were clean and smooth with some woodlice and cobwebs present. This feature was considered to have high suitability to support roosting bats and overall this tree was confirmed as having high suitability to support roosting bats following aerial inspection (see photographs 95 and 96 below).



Tree 3980_86_00803 was a mature oak with multiple suitability roost features. Woodpecker holes present at 9m on the western aspect that were found to be an active squirrel drey, a hazard bean at 9m on the western aspect and a knot hole at 10m on the western aspect were all considered to have high suitability to support roosting bats. Although some of the features were considered to have moderate suitability including pruning cuts and more knot holes, this tree was confirmed to have high suitability to support roosting bats overall following aerial inspection (see photograph 97 below).

Tree 3980_1630 was a mature oak with the stem splitting into an eastern and western stem that had multiple suitable roost features. Several features were downgraded to low or negligible suitability following aerial inspection; a tear out at 3m on the southern aspect, a wound at 3.5m and a tear out at 6m both on the south east aspect, as well as several woodpecker holes and a knot hole at 3.5m on the eastern aspect and southern aspect respectively. Woodpecker holes were present at 4m on the south and the east aspect and at 3.5m on the southern aspect considered to have moderate suitability to support roosting bats. There was also a woodpecker hole at 4m on the eastern aspect with a 7cm diameter that went upwards 20cm into a spire apex, down 7cm with an internal width of 15cm that was dry, smooth and clean inside and considered to have high bat roost suitability. Overall this tree was confirmed to have high suitability to support roosting bats following aerial inspection (see photographs 98-100 below).

Table 25: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 3980

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
3980_1625	Y	Down	Moderate	Negligible
3980_87_01877	Y	Down	Moderate	Negligible
3980_86_00048	Y	Down	Moderate	Negligible
3980_1616	Y	Down	Moderate	Low
3980_1620	Y	Down	Moderate	Low
3980_1621	Y	Down	Moderate	Low
3980_1622	Y	Down	Moderate	Low
3980_86_00802	Y	Down	Moderate	Low
3980_1618	Y	No change	Moderate	Moderate
3980_1623	Y	No change	Moderate	Moderate
3980_1626	Y	No change	Moderate	Moderate
3980_1619	Y	No change	Moderate	Moderate
3980_1628	Y	No change	Moderate	Moderate
3980_1629	Y	No change	Moderate	Moderate
3980_88_01879	N	No change	Moderate	High



3980_1627	Y	No change	High	High
3980_1624	Y	No change	Moderate	High
3980_1634	Y	No change	High	High
3980_00803	Y	No change	High	High
3980_1630	Y	No change	High	High

Survey Photographs of trees within Land Parcel 3980



Photograph 77: Tree 3980_1625, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 78: Tree 3980_87_01877, Land Parcel 3980, 13/09/2018, standard lens.





Photograph 79: Tree 3980_86_00048, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 80: Tree 3980_1616, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 81: Tree 3980_1620, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 82: Tree 3980_1621, Land Parcel 3980, 13/09/2018, standard lens.





Photograph 83: Tree 3980_1622, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 84: Tree 3980_86_00802, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 85: Tree 3980_1618, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 86: Tree 3980_1623, Land Parcel 3980, 13/09/2018, standard lens.





Photograph 87: Tree 3980_1626, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 88: Tree 3980_1619, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 89: Tree 3980_1628, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 90: Tree 3980_1629, Land Parcel 3980, 13/09/2018, standard lens.





Photograph 91: Tree 3980_88_01879, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 92: Tree 3980_1627, Land Parcel 3980, 13/09/2018, standard lens.

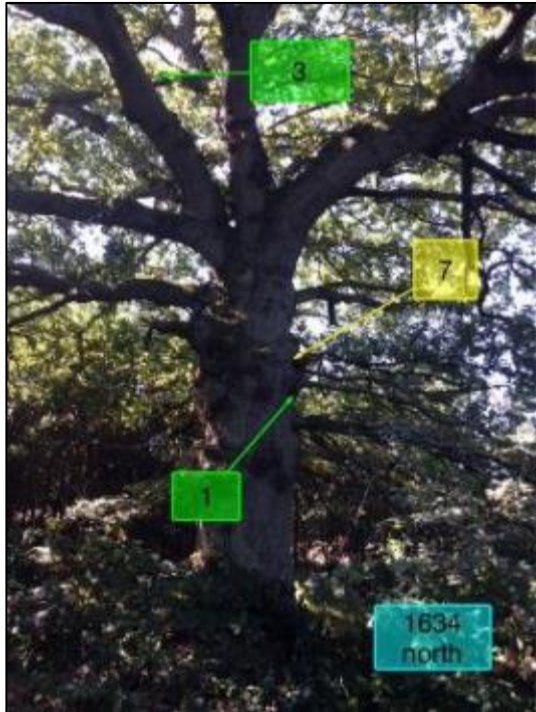


Photograph 93: Tree 3980_1624 from the north, Land Parcel 3980, 13/09/2018, standard lens.

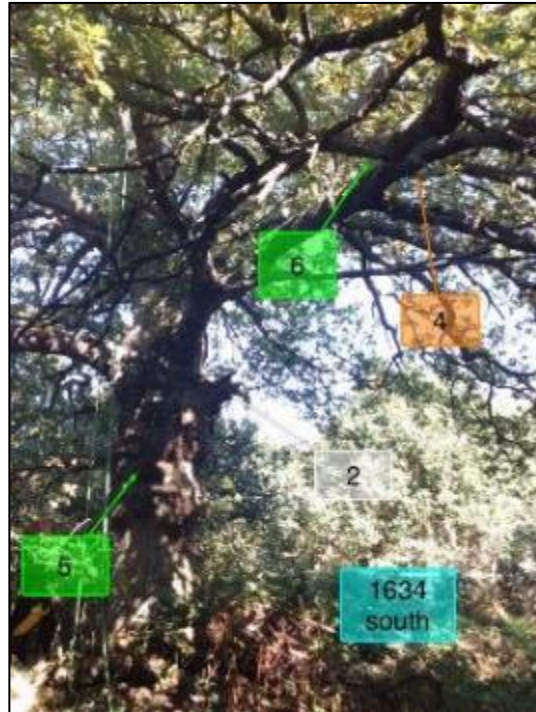


Photograph 94: Tree 3980_1624 from the south, Land Parcel 3980, 13/09/2018, standard lens.

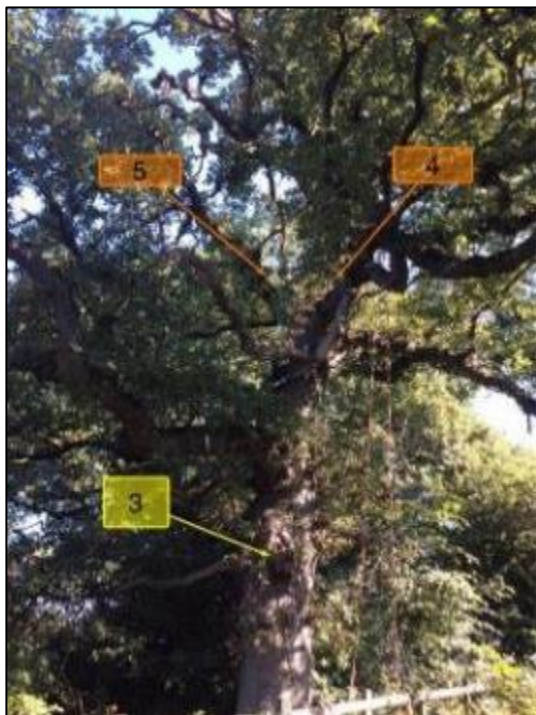




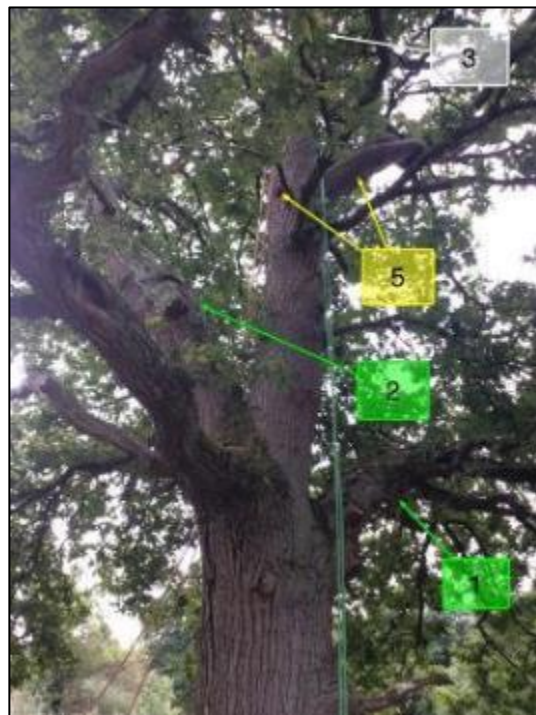
Photograph 95: Tree 3980_1634 from the north, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 96: Tree 3980_1634 from the south, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 97: Tree 3980_86_00803, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 98: Tree 3980_1630 northern and eastern aspects, Land Parcel 3980, 13/09/2018, standard lens.





Photograph 99: Tree 3980_1630 eastern aspect, Land Parcel 3980, 13/09/2018, standard lens.



Photograph 100: Tree 3980_1630 southern aspect, Land Parcel 3980, 13/09/2018, standard lens.

x. Land Parcel 3230

The area is approximately 0.5ha in size and contains a total of one tree that was highlighted for further survey, following the initial GBBRA survey. Aerial surveys were carried out on the 17th September 2018. This tree was confirmed to have moderate suitability to support roosting bats following aerial inspection.

Tree 3230_089_01880 was a double-stemmed Oak species with a pruning cut at 3m on the eastern aspect with rotten heartwood inside and a hole extending horizontally backwards 12cm with a bowl-shaped base. This feature was found to offer limited shelter so was considered to have low bat roost suitability. A woodpecker hole was also present at 2.5m on the eastern aspect that lead backwards 12cm with additional minor crevices off the main hole and was dry with a bumpy surface internally. This feature, and the tree overall were confirmed to have moderate suitability to support roosting bats following aerial inspection.

Table 26: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 3230

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection

Telephone : 01273 911180

info@arbeco.co.uk www.arbeco.co.uk



3230_089_01880	Y	No change	Moderate	Moderate
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Survey Photographs of trees within Land Parcel 3980



Photograph 101: Tree 3230_089_01880, Land Parcel 3230, 17/09/2018, standard lens.

y. Land Parcel 3200

The area is approximately 72.7 ha in size and contains a total of fourteen trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 3rd October 2018.

Two of the trees initially identified as having suitability to support roosting bats during ground-based assessments no longer fall within the 10m buffer of the proposed pipeline route following the release of Design Freeze B, so did not require further survey. One was a dead tree (3200_994) considered to have low suitability, and one was a mature oak (3200_991) considered to have moderate suitability to support roosting bats.

The initial ground surveys identified 12 trees in this land parcel as having moderate suitability to support roosting bats, of these trees:

- Trees 3200_91_01849 and 3200_993 was downgraded from moderate to negligible suitability



- Trees 3200_91_01848, 3200_1640, 3200_992 and 3200_91_01846 were downgraded to low suitability to support roosting bats.
- Trees 3200_885, 3200_939, 3200_995 and 3200_91_01847 were confirmed as having moderate suitability
- Tree 3200_884 was upgraded from moderate to high suitability to support roosting bats.
- Tree 3200_887 was considered to have high suitability to support roosting bats during the initial ground assessment, this classification was confirmed by the aerial tree inspection.

Tree 3200_91_01849 was a mature oak with a woodpecker hole at 11m and a knot hole at 4m, both on the southern aspect. Following aerial survey these features were both downgraded from moderate to negligible bat roost suitability as they were shallow and exposed, offering limited shelter (see photograph 102 below).

Tree 3200_993 was a mature oak in a woodland area, close to two others. This tree was initially assessed using a high-powered torch from the ground. Knot holes and a wound were both present at 5m on the eastern aspect. Following closer inspection both features were downgraded from moderate to negligible suitability to support roosting bats as they were shallow offering limited shelter (see photograph 103 below).

Tree 3200_91_01848 was a dead tree of unknown species with a woodpecker hole at 6m on the western aspect. This tree was considered unsafe to climb; however, the hole was inspected with a torch and endoscope from ground level and was found to be very exposed with limited shelter. This tree was downgraded from moderate to low suitability to support roosting bats (see photograph 104 below).

Tree 3200_1640 was a mature multi-stemmed beech in open woodland with two wounds at 2m and 5m on the northern aspect of the main stem. These features were found to offer limited shelter during aerial inspection and were downgraded from moderate to low suitability to support roosting bats (see photograph 105 below).

Tree 3200_992 was a dead tree missing much of its bark and with a large lifted bark plate at 2m on the eastern aspect. This tree was considered unsafe to climb, however was inspected from the ground during climbing surveys using an endoscope from the ground level and downgraded from moderate to low suitability to support roosting bats due to it being rotten, soft wood with a dense covering of cobwebs and debris leaving little space behind the bark plates (see photograph 106 below).

Tree 3200_91_01846 was a mature beech close to the side of a road. A wound at 2.5m on the southern aspect was confirmed as having low suitability to support roosting bats as it had a very narrow entrance just 6mm wide. A woodpecker hole at 4m on the southern aspect was downgraded from moderate to low suitability as it didn't extend more than 5cm into the tree and was dirty inside. Overall this tree was re-classified from moderate to low suitability to support roosting bats following aerial inspection (see photograph 107 below).



Tree 3200_885 was a mature oak with a bat box on it. Two knot holes were downgraded to negligible bat roost suitability as they were found to be shallow and exposed. The bat box was fairly old, had cobwebs around the entrance at the time of survey and was being used as a birds' nest, however still had potential for roosting bats. Overall this tree was confirmed to have moderate suitability to support roosting bats following aerial inspection (see photograph 108 below).

Tree 3200_939 was a mature oak with a hazard beam from a split branch at 4m on the south east aspect. This feature was found to offer moderate bat roost suitability, it was a 35cm by 2cm split leading into a 12cm cavity at the top with a conical apex. There were numerous slugs and woodlice present but inside was sheltered and secure. This tree was confirmed as having moderate suitability to support roosting bats following aerial inspection (see photograph 109 below).

Tree 3200_995 was a dead tree of unknown species with a tear out at 2m on the southern aspect less than a meter from the main trunk. The feature had a 2-3cm entrance into a cavity which lead 15cm into the branch with a cone apex, was dry and secure and offered shelter behind a callous. This tree was confirmed to have moderate suitability to support roosting bats following aerial inspection (see photograph 110 below).

Tree 3200_91_01847 was a semi-mature beech close to the side of the road with two features that were subject to aerial survey. A knot hole present at 1m on the western aspect was downgraded to low suitability following aerial survey as it was small and very dirty with an obstructed drop zone. A large frost crack approximately 1m long at 3m height on the western aspect was confirmed as having moderate suitability to support roosting bats. It had a hollow stem leading upwards 40cm with a bumpy substrate and some cobwebs and debris inside. Overall this tree was confirmed to have moderate suitability to support roosting bats following aerial inspection (see photograph 111 below).

Tree 3200_887 was a very large oak overhanging the surrounding trees with multiple suitable roost features. Two features were downgraded from moderate to low and negligible suitability respectively following aerial inspection; a wound at 14m on the western aspect and a transverse snap from a large broken limb with splits along the remaining portion at 8m on the southern aspect. A transverse snap from another large broke limb was present at 10m on the western aspect that was found to have moderate bat roost suitability as it sloped downwards 20cm with a cone apex but was dirty with debris inside. A wound present at 13m on the north east aspect was confirmed as having high bat roost suitability following aerial survey it had a 5cm x 6cm entrance which narrowed and lead diagonally upwards 1m into a cavity with a wedge apex. Internally the feature was dry, smooth and secure. Overall this tree was confirmed to have high suitability to support roosting bats following aerial inspection (see photograph 112 below).

Tree 3200_884 was a mature oak with three suitable roost features that were subject to aerial survey. One feature, a wound at 4m on the southern aspect was found to be shallow and exposed and was downgraded from low to negligible suitability. A tear out at 7m on a branch on the south east aspect had a cavity behind with a 3x6cm entrance which lead upwards 80cm within the branch with additional crevices inside. Internally this feature was dry, smooth, secure and sheltered. A hazard beam was also present at 6m on the southeast aspect which was split 4m from the main



stem with a 4cm wide opening, extending 80cm with sheltered 15cm wedges at either end. Internally the space was smooth and clean with some woodlice and several cobwebs present. Overall this tree was re-classified from moderate to high suitability to support roosting bats following aerial inspection (see photograph 113 below).

Table 27: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 3200

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
3200_993	Y	Down	Moderate	Negligible
3200_91_01849	Y	Down	Moderate	Low
3200_91_01848	N /GENDO	Down	Moderate	Low
3200_1640	Y	Down	Moderate	Low
3200_992	N /GENDO	Down	Moderate	Low
3200_91_01846	Y	Down	Moderate	Low
3200_885	Y	No change	Moderate	Moderate
3200_939	Y	No change	Moderate	Moderate
3200_995	Y	No change	Moderate	Moderate
3200_91_01847	Y	No change	Moderate	Moderate
3200_887	Y	No change	High	High
3200_884	Y	Up	Moderate	High

Survey Photographs of trees within Land Parcel 3200





Photograph 102: Tree 3200_91_01849, Land Parcel 3200, 03/10/2018, standard lens.



Photograph 103: Tree 3200_993 Land Parcel 3200, 03/10/2018, standard lens.



Photograph 104: Tree 3200_91_01848 Land Parcel 3200, 03/10/2018, standard lens.



Photograph 105: Tree 3200_1640 Land Parcel 3200, 03/10/2018, standard lens.

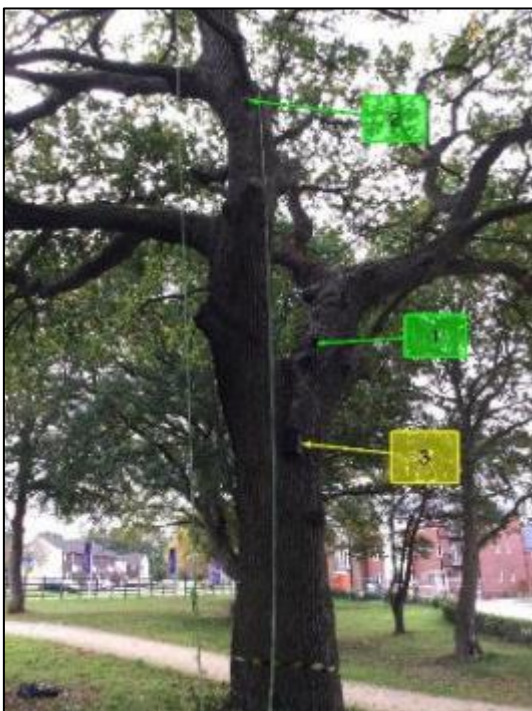




Photograph 106: Tree 3200_992 Land Parcel 3200, 03/10/2018, standard lens.



Photograph 107: Tree 3200_91_01846 Land Parcel 3200, 03/10/2018, standard lens.



Photograph 108: Tree 3200_885 Land Parcel 3200, 03/10/2018, standard lens.



Photograph 109: Tree 3200_939 Land Parcel 3200, 03/10/2018, standard lens.





Photograph 110: Tree 3200_995 Land Parcel 3200, 03/10/2018, standard lens.



Photograph 111: Tree 3200_91_01847 Land Parcel 3200, 03/10/2018, standard lens.



Photograph 112: Tree 3200_887 Land Parcel 3200, 03/10/2018, standard lens.



Photograph 113: Tree 3200_884 Land Parcel 3200, 03/10/2018, standard lens.



z. Land Parcel 4450

The area is approximately 550.2 ha in size and contains a total of 32 trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 23rd and 24th October 2018.

Due time constraints 14 trees within this land parcel were not able to be re-visited for aerial surveys. Of the 18 trees that were subject to second survey; six were re-classified as having negligible suitability (4450_1638, 4450_1637, 4450_924, 4450_1639, 4450_997 and 4450_998), two were considered to have low suitability (4450_825 and 4450_1600), nine were considered to have moderate suitability (4450_922, 4450_996, 4450_1597, 4450_1598, 4450_1599, 4450_999, 4450_921, 4450_923 and 4450_1000 and one was considered to have high suitability (4450_925) to support roosting bats.

Tree 4450_1638 is a mature oak tree in a woodland. Survey revealed a wound at approximately 3.5m height on the north aspect of the main stem. An aerial inspection confirmed that the wound was superficial, going straight through the tree and offering no protection from the elements. This tree was downgraded from moderate to negligible suitability to support roosting bats following aerial inspection.

Tree 4450_1637 is an over-mature dead multi stemmed tree of unknown species in woodland. It has been subject to a tear out at 1m height on the north aspect of the main trunk, the entrance to which is hidden by a thicket too dense for bats to enter. A wound at 1.75m height on the south aspect of the main trunk offered negligible suitability to support roosting bats. This tree was downgraded from moderate to negligible suitability to support roosting bats following aerial inspection.

Tree 4450_924 is a mature scots pine at the edge of a woodland. Survey revealed multiple wounds on the south west aspect of the main stem at 2.5m height, with negligible suitability to support roosting bats due to their exposed nature. This tree was downgraded from moderate to negligible suitability to support roosting bats following aerial inspection.

Tree 4450_1639 is a mature multi-stemmed whitebeam at the edge of a track leaning towards a woodland. Survey revealed wounds on the leaning trunk at 2.5m height; an aerial inspection revealed that this did not extend inside the tree. A compression fork at 1.5m height on the north aspect of the main stem was also found to offer negligible suitability to support roosting bats due to its exposed nature. This tree was downgraded from moderate to negligible suitability to support roosting bats following aerial inspection.

Tree 4450_997 is a mature birch subject to butt rot near a fence line in the same car park as 4450_996. Survey revealed woodpecker holes at 2m height on the east aspect of the main stem. An aerial inspection revealed that these were of negligible suitability as they were very shallow, thereby reducing the overall tree grade from moderate to negligible suitability to support roosting bats following aerial inspection.

Tree 4450_998 is a mature scots pine bordering woodland in the same car park as 4450_996. Survey revealed wounds at 3m height on the north east aspect of the main stem. These wounds



were very shallow not offering shelter. Therefore, the aerial inspection found these to be of negligible suitability to support roosting bats, thereby reducing the overall tree grade to negligible.

Tree 4450_825 is a mature oak tree at the edge of a woodland. Survey revealed lifting bark at 2m height on the north aspect of a limb approximately 1.5m from the main trunk. Aerial inspection revealed that these features didn't extend further into the tree and confirmed the overall tree grade as low.

Tree 4450_1600 is a dead birch tree leaning away from the road in the same car park as 4450_996. Survey revealed lifting and loose bark at 4m height on the north aspect of the main stem; an aerial inspection noted this feature as being of low suitability. Woodpecker holes were also found on the east aspect of the main stem at 3m height, however these were classed as negligible as were considered too shallow to provide any shelter. Overall tree grade after aerial inspection was reduced to low.

Tree 4450_922 is a mature oak tree at the edge of a woodland. Survey revealed knot holes on the north aspect of the lowest west facing branch at approximately 2.5m height. Aerial inspection revealed that the limb is dead, with the hole extending 45cm into the limb containing a defunct bird's nest. A knot hole was also discovered at 3m height on the south west aspect of a dead limb; desiccated fissures 15cm deep were found with a wet rotten base. Overall this tree was confirmed to have moderate suitability to support roosting bats following aerial inspection.

Tree 4450_996 is a mature scots pine with a highly deteriorated base in a car park. Survey revealed some lifting bark on the north aspect of the main stem at approximately 4m height. An aerial inspection was not carried out as it was deemed too dangerous, therefore the overall tree grade was maintained at moderate.

Tree 4450_1597 is a mature dual-stem scots pine located near a path in the same car park as 4450_996. Survey revealed numerous woodpecker holes and wounds on the south and east aspects of the main stems between 2 and 4m in height. An aerial inspection was deemed too dangerous; therefore, the tree retained its original moderate grade.

Tree 4450_1598 is a dead tree of unknown species with no crown in a wet woodland. Two woodpecker holes were found on the north aspect of the main stem at 4m height, however an aerial inspection was deemed too dangerous; therefore, the tree must retain its original moderate grade.

Tree 4450_1599 is a dead scots pine in the same car park as 4450_996. Survey revealed several woodpecker holes at the top of the trunk at 4m height on the north aspect. An aerial inspection was deemed too dangerous; therefore, the tree must retain its original moderate grade.

Tree 4450_999 was a mature willow with two stems, with woodpecker holes and numerous wounds, all on the western aspect. This tree was not climbed during aerial surveys due to health and safety reasons so retained the original classification of moderate suitability to support roosting bats.

Tree 4450_921 was a mature oak with a transverse snap at 3m and a wound on the underside of a branch at 7m, both on the north east aspect. This tree was confirmed as having moderate suitability to support roosting bats following aerial inspection.



Tree 4450_923 was a mature oak with woodpecker holes at 2.5m and butt rot, both on the northern aspect. A bee's nest was present, so the tree was unable to be climbed due to health and safety reasons, so retained the original classification of moderate suitability to support bats.

Tree 4450_1000 was a mature oak with woodpecker holes present at 3m on the northern aspect. Second survey revealed one hole to be 10cm deep and 5cm wide with a smooth entrance but a rough surface internally. This tree was confirmed as having moderate suitability to support roosting bats.

Tree 4450_925 was a mature Scots pine growing next to a gorse thicket. Woodpecker holes were present at 8m on the eastern aspect. One was found to extend inwards 30cm but had low suitability to support roosting bats, a second was found to extend inwards 20cm, upwards 15cm with a clean entrance and high suitability to support roosting bats. Wounds present on the eastern aspect were either blocked or open and exposed when inspected during the aerial survey. Overall this tree was re-classified from moderate to high suitability to support roosting bats.

Table 28: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 4450

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification	Classification after aerial inspection
4450_1638	Y	Down	Moderate	Negligible
4450_1637	Y	Down	Moderate	Negligible
4450_924	Y	Down	Moderate	Negligible
4450_1639	Y	Down	Moderate	Negligible
4450_997	Y	Down	Moderate	Negligible
4450_998	Y	Down	Moderate	Negligible
4450_825	Y	Down	Moderate	Low
4450_1600	Y	Down	Moderate	Low
4450_922	Y	No change	Moderate	Moderate
4450_996	N	No change	Moderate	Moderate
4450_1597	N	No change	Moderate	Moderate
4450_1598	N	No change	Moderate	Moderate
4450_1599	N	No change	Moderate	Moderate
4450_999	N	No change	Moderate	Moderate
4450_921	Y	No change	Moderate	Moderate
4450_923	N	No change	Moderate	Moderate
4450_1000	Y	No change	Moderate	Moderate
4450_925	Y	Up change	Moderate	High



aa. Land Parcel 4120

The area is approximately 116.3 ha in size and contains a total of 20 trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 23rd and 24th October 2018.

A total of 11 trees were re-classified as having negligible suitability (4120_956, 4120_955, 4120_954, 4120_950, 4120_949, 4120_953, 4120_46, 4120_211, 4120_98, 4120_835 and 4120_957) to support roosting bats following aerial survey. Two trees were confirmed to have low suitability (4120_958 and 4120_782) to support roosting bats, six were considered to have moderate suitability (4120_952), however five of these (4120_210, 4120_951, 4120_102, 4120_108 and 4120_836) were unable to be climbed due to health and safety reasons so were inspected using an endoscopic camera from ground level. One confirmed roost tree with a single common pipistrelle *Pipistrellus pipistrellus* bat inside was identified during aerial surveys (4120_110).

Tree 4120_956 was a mature willow with three stems, one of which has snapped and died, forking away at the base but is still attached to the main tree. A hazard beam was present at 2m on the northern aspect that was found not to continue following endoscopic survey and the tree was re-classified as having negligible suitability to support roosting bats.

Tree 4120_955 was a semi-mature oak with a wound at 1.75m on the northern aspect that extended upwards into the trunk. Following closer inspection with an endoscopic camera the wound was found to extend 20cm upwards in a dry narrow crevice ending in a conical apex filled with woodlice, this feature was considered too narrow for bats to enter. This feature was re-classified as having negligible suitability to support roosting bats.

Tree 4120_954 was a mature multi-stemmed willow that had been partially crushed by a neighbouring fallen tree. Lifted bark and hazard beams in the form of cracks along one of the branches being crushed by the fallen tree were present at 2m on the north east aspect. These features were both downgraded to negligible suitability to support roosting bats following inspection with an endoscopic camera.

Tree 4120_950 was a dead oak with wounds at 1.7m on the northern aspect and lifted bark on much of the main trunk. Both features were found to be superficial following inspection with an endoscopic camera and the tree was subsequently re-classified as having negligible suitability to support roosting bats.

Tree 4120_949 was a mature oak forking into two stems at around 2m height. A hazard beam was present at 2.5m on the eastern aspect with multiple cracks on the underside of the lowest branch. This tree was re-classified as having negligible suitability to support roosting bats.

Tree 4120_953 was a mature multi-stemmed willow with a snapped stem hanging towards a path. These wounds were found to be superficial with no cavities or voids, so the tree was re-classified as having negligible suitability to support roosting bats.



Tree 4120_46 was a dead oak with two knot holes present at 3m and 6m, both on the northern aspect. The lower knot hole was found to be only 2cm deep and rough inside with no real ingress and the other was found to be superficial. Both were re-classified as having negligible suitability to support roosting bats.

Tree 4120_211 was a mature fallen oak that was still alive but had the top cut off. A crack was present at 1.8m where the top of the tree had been previously sawed leaving a hole that extended 20cm downwards but had only 8cm of space with sufficient space for bats. Numerous cobwebs were present and there was no evidence of previous use by bats, this feature was therefore re-classified as having negligible suitability to support roosting bats.

Tree 4120_98 was a dead birch close to the road with multiple suitability roost features. When re-visited for aerial survey the tree was found to have collapsed and on stem had shattered on impact. This tree was therefore re-classified as having negligible suitability to support roosting bats.

Tree 4120_835 was a dead silver birch with a woodpecker hole at 3m on the southern aspect. This hole was found to be superficial and the tree was re-classified as having negligible suitability to support roosting bats.

Tree 4120_957 was a mature oak with several transverse snapped branches at 4m with holes that were all found to be superficial following inspection with an endoscopic camera. This tree was subsequently re-classified from moderate to negligible suitability to support roosting bats.

Tree 4120_958 was a mature with two stems which fork right at the base with butt-rot at 1m on the north west aspect which extended in a narrow slit along the base and up approximately 1.75m on both stems. On one stem there was a 25cm spire within a frost crack but there was no evidence of bats or substrate modification to indicate use of the feature by bats. On the other stem the slit extended into a 12cm tall ingress with a conical apex with damp inside with a wet sludgy substrate with numerous woodlice. Both features were re-classified as having low suitability to support roosting bats following the second survey.

Tree 4120_782 was a mature silver birch with butt rot and a wound directly above it at 2m, both on the southern aspect. The butt rot was found to have a large bottom cavity with rough sides, cobwebs, dust and spongy brown-rot heartwood which was collapsing throughout. The underside of the bottom cavity was a nest / squirrel drey and formed a roof approximately 1.8m above the rot. The upper cavity was open at the top and very exposed. Some crevices were present in each cavity but were generally cluttered by nearby vegetation so unlikely to be found or used. The wound was a rough dome inside with another smaller crevice within the crevice which extended 10cm upwards. Both features were re-classified as having low suitability to support roosting bats.

Tree 4120_952 was a mature multi-stemmed willow growing within the woodland edge with a large snapped stem with suitable cavities in the stem and base. The tear out was not visible during the second survey, curled bark was present but was exposed. No fissures or other significant cavities were found, however there was low suitability for an opportunistic day roost within the feature. The branch was noted to be rotten and hanging with little support. Overall this tree retained its ground-based classification of moderate suitability to support roosting bats.



Tree 4120_210 was a dead, leaning oak with another live oak leaning against it. Knot holes were present at 2m on the southern aspect that was found to only extend 5cm and was re-classified as having negligible suitability to support roosting bats. This tree was not climbed due to health and safety reasons so the knot hole at 3.5m and wounds present at 3m, both on the southern aspect, kept their original classification of moderate suitability to support roosting bats.

Tree 4120_951 was a mature oak with wounds that were present at 3m on the northern aspect on the under-side of branches. This tree was not climbed due to health and safety reasons and the feature was not able to be re-located, therefore the original classification of moderate suitability to support roosting bats remains.

Tree 4120_102 was a dead Scots pine with multiple features with suitability to support roosting bats. This tree was not climbed due to health and safety reasons however woodpecker holes at 2m on the eastern aspect were inspected and found to be superficial and was re-classified as having negligible suitability to support roosting bats. Woodpecker holes at 4.5m and 7m, both on the eastern aspect as well as several snapped branches and wounds, both at 4m on the southern aspect retained their ground-based classification of having moderate suitability to support roosting bats.

Tree 4120_108 was a dead Scots pine with a hazard beam at 3m on the northern aspect and wounds present at 1.5m on the western aspect. This tree was not climbed due to health and safety reasons however the wound was low enough to be inspected from ground level and was found to ingress 15cm but was too narrow for bats and was re-classified as having low suitability to support roosting bats. The hazard beam retained its original classification of moderate suitability as an updated inspection was not possible.

Tree 4120_836 was a mature oak with knot holes present at 3m on the eastern aspect. This tree was not climbed due to health and safety reasons so retained its initial ground-based classification of moderate suitability to support roosting bats.

Tree 4120_110 was a large mature oak next to a holly thicket with woodpecker holes at 6m on the south east aspect that was found to have negligible bat roost suitability. A long wound running along the underside of a branch was also present at 2.5m on the eastern aspect. On closer inspection the wound was found to comprise two cavities which were able to be accessed by three holes in the heartwood. The three access points had entrances of 2x4cm, 1.25x4cm and 4x5cm. The lowest cavity was found to extend downwards towards the main stem by 50cm in a smooth, dry crevice with high suitability to support several bats. The middle cavity extended upwards towards the tip of the dead branch, passing the top hole in an approximately 80cm long crevice that had a damp and a smooth dry side in a kidney shape between the outer bark and desiccated, inner heartwood. Inspection of this crevice was possible from the top only and revealed a single common pipistrelle *Pipistrellus pipistrellus* bat roosting inside, while a second was heard social calling during the survey. This was therefore a confirmed roost tree and was considered to be a possible mating roost. Interpretation of the features suggested that the lower cavity may be used during summer months and the upper cavity may be used by single or low numbers of bats over winter.



Table 29: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 4120

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
4120_956	Y	Down	Moderate	Negligible
4120_955	Y	Down	Moderate	Negligible
4120_954	Y	Down	Moderate	Negligible
4120_950	Y	Down	Moderate	Negligible
4120_949	Y	Down	Moderate	Negligible
4120_953	Y	Down	Moderate	Negligible
4120_46	Y	Down	Moderate	Negligible
4120_211	Y	Down	Moderate	Negligible
4120_98	N	Down	Moderate	Negligible
4120_835	Y	Down	Moderate	Negligible
4120_957	Y	Down	Moderate	Negligible
4120_958	Y	Down	Moderate	Low
4120_782	Y	Down	Moderate	Low
4120_952	Y	No change	Moderate	Moderate
4120_210	N	No change	Moderate	Moderate
4120_951	N	No change	Moderate	Moderate
4120_102	N	No change	Moderate	Moderate
4120_108	N	No change	Moderate	Moderate
4120_836	N	No change	Moderate	Moderate
4120_110	Y	Up	Moderate	Confirmed Roost

bb. Land Parcel 4390

The area is approximately 142.5 ha in size and contains a total of ten trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 3rd October 2018.

Two of the trees within this land parcel were not able to be surveyed during the aerial inspections due to time and access constraints. Both trees (4390_98_00804 and 4390_98_00805) were mature oaks that were classified as having moderate suitability to support roosting bats based on ground assessment results.

Of the trees subject to aerial inspection, two were downgraded from moderate to low suitability (4390_01690 and 4390_1692) to support roosting bats, four retained their original classification of



moderate suitability (4390_01688, 4390_00937, 4390_01689 and 4390_00938), one was upgraded from moderate to high suitability (4390_01691) and one tree retained its original classification of high suitability (4390_00936) to support roosting bats.

Tree 4390_01690 was a mature oak with pruning cuts at 3m on the north west aspect and woodpecker holes at 6m and 5m on the southern and north west aspect respectively. All three features were downgraded to low suitability to support roosting bats following aerial survey as they were open, shallow and offered limited shelter (see photograph 114 below).

Tree 4390_1692 was a mature oak with frost cracks present along branches 6-8m high. This tree was deemed unsafe to climb; however, the features were re-assessed using a high-powered torch and an endoscope from the ground. The cracks were described as having numerous dead sections and offered very limited suitability to support roosting bats. The tree was subsequently re-classified from moderate to low suitability following aerial survey (see photograph 115 below).

Tree 4390_01688 was a mature oak with pruning cuts at 7m on the eastern aspect that were confirmed to have low suitability to support roosting bats as cavities were shallow, offering limited shelter. Two features were confirmed as having moderate suitability to support roosting bats; a knot hole at 4m on the southern aspect with an entrance of 10cmx6cm which led backwards 20cm into the tree with a domed apex and a wound at 5m on the northern aspect 2m from the main trunk which had a 4cm diameter entrance extending back 20cm and upwards 5cm with a dirty base. Overall this tree was considered to have moderate suitability to support roosting bats (see photograph 116 below).

Tree 4390_00937 was a mature oak with pruning cuts at 5m on the southern aspect. Aerial survey confirmed this feature to have moderate suitability to support roosting bats. The entrance was 5cmx3cm and opened into a wound that led backwards 15cm horizontally with a domed apex and was sheltered inside (see photograph 117 below).

Tree 4390_01689 was a mature oak with multiple suitability roost features identified during GBBRA surveys. Pruning cuts at 4m on the southern aspect were found to offer negligible suitability and two features were downgraded from moderate to low suitability; a hazard beam at 6m on the western aspect that was found to offer limited shelter and a knot hole at 7m on the western aspect that was found to be shallow and exposed. A wound at 11m on the western aspect was confirmed as having moderate suitability to support roosting bats with an entrance of 3cmx6cm, it led backwards 4cm and up 35cm with a smooth, ridged surface and was dry and clean with a small secondary hole at the top. Overall this tree was considered to have moderate suitability to support roosting bats (see photograph 118 below).

Tree 4390_00938 was a mature oak with two woodpecker holes on opposite sides of the trunk, present at 3m height. The holes were found to be connected through the trunk. Bees were present at the time of the aerial survey however; the tree retained a classification of moderate suitability to support roosting bats (see photograph 119 below).

Tree 4390_00936 was a mature oak with wounds present at 1.5m on the north west aspect. The feature had an opening of 3cmx7cm, led backwards 25cm and up 25cm into a sheltered cavity,



which was dry and secure with a bumpy apex. This tree was confirmed as having high suitability to support roosting bats following aerial assessment (see photograph 120 below).

Tree 4390_01691 was a mature oak with three woodpecker holes present at 5m on the southern aspect, the lowest of which was a squirrel drey. One of the holes was found to extend 90cm upwards into a hollow stem and back 25cm. The hole had a smooth and ridged surface, a domed apex and led downwards into a secondary egress point. Some woodlice were present. This tree was re-classified from moderate to high suitability to support roosting bats following aerial survey (see photograph 121 below).

Table 30: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 4390

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
4390_01690	Y	Down	Moderate	Low
4390_1692	N / GENDO	Down	Moderate	Low
4390_01688	Y	No change	Moderate	Moderate
4390_00937	Y	No change	Moderate	Moderate
4390_01689	Y	No change	Moderate	Moderate
4390_00938	Y	No change	Moderate	Moderate
4390_00936	Y	No change	High	High
4390_01691	Y	Up	Moderate	High

Survey Photographs of trees within Land Parcel 4390

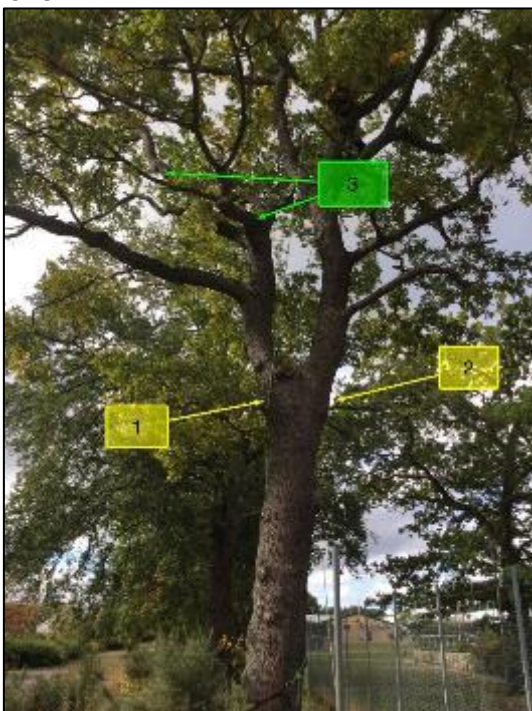




Photograph 114: Tree 4390_01690, Land Parcel 4390, 03/10/2018, standard lens.



Photograph 115: Tree 4170_01692, Land Parcel 4390, 03/10/2018, standard lens.



Photograph 116: Tree 4390_01688, Land Parcel 4390, 03/10/2018, standard lens.



Photograph 117: Tree 4390_00937, Land Parcel 4390, 03/10/2018, standard lens.





Photograph 118: Tree 4390_01689, Land Parcel 4390, 03/10/2018, standard lens.



Photograph 119: Tree 4390_00938, Land Parcel 4390, 03/10/2018, standard lens.



Photograph 120: Tree 4390_00936, Land Parcel 4390, 03/10/2018, standard lens.



Photograph 121: Tree 4390_01691, Land Parcel 4390, 03/10/2018, standard lens.



cc. Land Parcel 5050

The area is approximately 4.7ha in size and contains a total of six trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial inspections were carried out on the 17th September 2018.

A total of two trees were confirmed to have low suitability (trees 5050_104_4 and 5050_104_939) and four were confirmed to have moderate suitability (trees 5050_104_936, 5050_104_938, 5050_104_934 and 5050_104_935) to support roosting bats following aerial inspections.

Tree 5050_104_4 was a Poplar sp. with a tear out at 1m height on the southern aspect. This feature was found to extend 30cm upwards inside the tree but was filled with cobwebs and debris leaving little shelter. The feature had a 5cm diameter and had a damp, rough surface. This tree was confirmed to have low suitability to support roosting bats following aerial inspection.

Tree 5050_104_939 was a Willow sp. with a hazard beam present along a limb at 2m height on the eastern aspect. The hazard beam had a crevice 3m long and with dry with a bird's nest, cobwebs and debris present but was open and exposed. This tree was confirmed to have low suitability to support roosting bats following aerial inspection.

Tree 5050_104_936 was an English Oak with a knot hole at 6m height on the southeast aspect. The feature went upwards 35cm inside the tree and internally it was dry with a waxy, smooth surface, some minor debris and some cobwebs, the hole was semi-exposed but offered some shelter. This tree was confirmed to have moderate suitability to support a transitional or summer bat roost following aerial inspection.

Tree 5050_104_938 was a Willow sp. with a knot hole at 5m height on the southeast aspect. The hole extended upwards 10cm with a 2.5cm diameter, although there were slugs, cobwebs and debris present and the hole was moist the tree was confirmed to have moderate suitability to support roosting bats following aerial inspection.

Tree 5050_104_934 was a Willow sp. with a knot hole present at 3m height on the southeast aspect. The feature had a 4cm diameter and extended back 35cm horizontally into the tree, there were woodlice present as well as some leaf litter and debris at the base. The surface was rough and damp, but the feature was secure and offered some shelter. This tree was confirmed to have moderate suitability to support roosting bats following aerial inspection.

Tree 5050_104_935 was a Willow sp. with a tear out at 2m height on the southern aspect. This feature had an entrance 40cm high with an internal diameter of 2.5cm. Slugs and spiders were present and internally the feature was very damp. The feature could not be inspected to the very top as it required an endoscope extension however there was some shelter and it was semi-secure, so the tree retained its original ground-based classification of moderate suitability to support roosting bats.

Table 31: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 5050



Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
5050_104_4	Y	No change	Low	Low
5050_104_939	Y	No change	Low	Low
5050_104_936	Y	No change	Moderate	Moderate
5050_104_938	Y	No change	Moderate	Moderate
5050_104_934	Y	No change	Moderate	Moderate
5050_104_935	Y	No change	Moderate	Moderate

dd. Land Parcel 5960

The area is approximately 10.3 ha in size and contains a total of two trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 17th September 2018.

One of the trees was re-classified from moderate to low suitability (5960_106_1596) and one retained its ground-based classification of moderate suitability (5960_106_01595) following aerial inspection.

Tree 5960_106_1596 was a Beech with a large cavity and decay at the base, 0.5m height and a large knot hole at 2.5m height both on the northern aspect. The decay at the base went back 50cm into the tree and extended 50cm upwards but was exposed, damp, rough and full of debris. This feature was considered to have negligible suitability. The knot hole was in a branch off the main stem and extended upwards 60cm with a 30cm by 15cm opening. The feature was damp and upwards facing with slugs and worms inside. Overall this tree was downgraded from moderate to low suitability to support roosting bats following aerial inspection.

Tree 5960_106_01595 was a Beech with a knot hole and large tear out both present at 9m height on the eastern aspect. The knot hole had a 20cm diameter and led upwards 50cm into a smooth chamber which contained an old squirrel drey. Internally the knot hole was smooth, clean and dry with some shelter. The large tear out had a cavity extending into a limb that led upwards 30cm with a 5cm diameter into a chamber with a disused bird's nest inside and was rough and dry. Although some cobwebs, woodlice and slugs were present this feature was semi-secure. Both features and the tree were confirmed to have moderate suitability to support roosting bats following aerial inspection.

Table 32: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 5960

Tree ID	Climbed (Y/N)	Re-classified? (up down)	Original Classification	Classification after aerial inspection
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		or no change)	following GBBRA	
5960_106_1596	Y	Down	Moderate	Low
5960_106_01595	Y	No change	Moderate	Moderate

ee. Land Parcel 7790

The area is approximately 160.8 ha in size and contains a total of thirteen trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 24th October 2018.

Four trees were not reassessed during aerial surveys, these included a mature willow (7790_00223), a semi-mature oak (7790_00221) and a mature Scots pine (7790_00225) all considered to have moderate suitability, and a mature Scots pine (7790_00224) that was considered to have high suitability to support roosting bats.

Of the trees surveyed; two trees were downgraded from moderate to negligible suitability (7790_00485 and 7790_00490), one tree was downgraded from moderate to low suitability (7790_00222), two trees were considered unsafe to climb and retained their original classification of moderate suitability (7790_00226 and 7790_00489), two others that were climbed also retained their original classification of moderate suitability (7790_00487 and 7790_00488), one tree that was unsafe to climb retained its original classification of high suitability (7790_00491) and one tree was re-classified from moderate to high suitability (7790_00227) following aerial inspections.

Tree 7790_00485 was a mature oak with a large tear out at 8m on the eastern aspect with a crack through it. This was found to be superficial with no crevices following aerial survey and was re-classified from moderate to negligible suitability to support roosting bats.

Tree 7790_00490 was a mature silver birch with a tear out at 3m on the north east aspect was a small branch below that appeared to extend downwards. This feature was downgraded from moderate to negligible suitability following aerial inspection as it did not extend downwards, offering little shelter.

Tree 7790_00222 was a semi-mature oak within woodland with a wound at 4m on the northern aspect and a wound at 3m on the southern aspect. The northern wound was found to be superficial and was re-classified from moderate to low suitability to support roosting bats. The southern wound had three access points, the upper access point was in a knot hole and too narrow for bats and the lower two connected to form a narrow crevice. This feature was downgraded from moderate to low suitability to support roosting bats.

Tree 7790_00226 was a dead standing trunk with numerous woodpecker holes considered to have moderate suitability to support roosting bats. Surveys were limited to inspection using an endoscope due to the condition of the tree but holes up to 4m were found to be superficial with negligible suitability. This tree was in poor condition so was recommended for emergence and re-entry survey and retained its original classification of moderate suitability to support roosting bats.



Tree 7790_00487 was a semi-mature silver birch with a wound at 1.5m on the western aspect with an entrance of 1cm diameter extending upwards 17cm in a narrow crevice filled with woodlice. This tree was confirmed as having moderate suitability to support roosting bats.

Tree 7790_00488 was an over-mature silver birch with an impact shatter at 2.5m on the western aspect on a fallen tree. The shatter extended into a cavity with a roughly ovular 8x8cm entrance which led in 10cm with a rough surface then extended 15cm into a smooth clear horizontal spire. Woodlice were present. This tree was confirmed as having moderate suitability but would be suitable to support a single day roosting bat, outside the hibernation period.

Tree 7790_00489 was a dead pine with the top missing and numerous woodpecker holes present at 6m on all aspects. This tree was considered unsafe to climb due to health and safety reasons and the features were too high to inspect with an endoscopic camera so the ground assessment classification of moderate suitability to support roosting bats remained appropriate.

Tree 7790_00491 was a hollow dead oak with three features that were considered to have high suitability based upon ground assessments. Approximately 15 woodpecker holes were present between 2.5m and the top on the north east aspect, the bottom four were later inspected using an endoscope and found to be superficial with negligible suitability to support roosting bats. The tree was not able to be climbed due to health and safety reasons, however, hazard beam at 6m and a transverse snap at the top of the tree, both on the northern aspect were considered to have high bat roost suitability.

Tree 7790_00227 was a dead stem of a mature oak with a wound at 1.3m on the western aspect. A crevice to the left of the heartwood was later found to extend 90cm upwards into a smooth, slightly bobbled and glassy spire. Woodlice and two leopard slugs were present, and the substrate was clean indicating invertebrate gleaning or bat habitation. This tree was re-classified from moderate to high suitability to support roosting bats.

Table 33: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 7790

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
7790_00485	Y	Down	Moderate	Negligible
7790_00490	Y	Down	Moderate	Negligible
7790_00222	Y	Down	Moderate	Low
7790_00226	N	No change	Moderate	Moderate
7790_00487	Y	No change	Moderate	Moderate
7790_00488	Y	No change	Moderate	Moderate
7790_00489	N	No change	Moderate	Moderate
7790_00491	N / GENDO	No change	High	High



7790_00227	Y	Up	Moderate	High
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ff. Land Parcel 8000

The area is approximately 16.6 ha in size and contains a total of two trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 25th September 2018. Both trees retained their high suitability to support roosting bats after the aerial inspection survey.

Tree 8000_00926 was a mature twin stem poplar/ aspen with a woodpecker hole present at 5m height on the southern aspect. The entrance was 7x7cm with the hole extending upwards at the back of the cavity. At the time of survey this feature could not be fully inspected due to a woodpecker being present nesting in the base, however this tree was considered to have high suitability to support roosting bats (see photograph 122 below).

Tree 8000_00927 was a semi-mature twin stem willow *Salix* spp. with two features that were subject to aerial survey. One feature, an old limb tear at 4.5m on the southern aspect was downgraded to negligible suitability. A second wound at 2m on the southern aspect was considered to have high bat roost suitability, with an entrance of 6x1.5cm it extended upward 15cm into a wedge apex and was secure and damp with some slugs and earwigs present. This tree was considered to have high suitability to support roosting bats (see photograph 123 below).

Table 34: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 8000

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
8000_00926	Y	No change	High	High
8000_00927	Y	No change	High	High

Survey Photographs of trees within Land Parcel 8000





Photograph 122: Tree 8000_926, Land Parcel 8000, 25/09/2018, standard lens.



Photograph 123: Tree 8000_927, Land Parcel 8000, 25/09/2018, standard lens.

gg. Land Parcel 72180

The area is approximately 8.0 ha in size and contains a total of 12 trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 25th October 2018.

Of the 12 trees that were surveyed within this land parcel; two were downgraded from moderate to negligible suitability (72180_00115 and 72180_00105), one was downgraded from moderate to low suitability (72180_00107), one tree was not climbed due to health and safety so retained its original classification of moderate suitability (72180_00106), three trees retained their original classification of moderate suitability (72180_00116, 72180_00108 and 72180_00114) one tree was downgraded from high to moderate suitability (72180_00112), two trees were re-classified from moderate to high suitability (72180_00113 and 72180_00110) and two trees retained their original classification of high suitability to support roosting bats (72180_111 and 72180_109) following aerial surveys.

Tree 72180_00115 was a mature alder with three trunks. A knot hole was present at 1m on the southern aspect that was found to extend down but not up, and an impact shatter at 1.5m on the eastern aspect were both downgraded from moderate to negligible suitability after inspection with endoscope to support roosting bats.

Tree 72180_00105 was a mature oak with holly and bramble at the base of the trunk. This tree had a desiccation fissure and a tear out, both at 7m on the north east and south east respectively. There



was also a wound at 8m on the north east aspect. All three features were found to be superficial following aerial inspection and were re-classified from having moderate to negligible suitability to support roosting bats.

Tree 72180_00107 was a mature oak with a forked trunk with a pruning cut with a small hole on the side extending into a cavity that was dry but full of cobwebs and extended 40cm into a lateral spire. This feature was downgraded to low suitability to support roosting bats. A tear out at 2m on the eastern aspect was upwards facing but did not lead anywhere so was re-classified as having negligible suitability to support roosting bats. Overall this tree was re-classified from moderate to low bat roost suitability.

Tree 72180_00106 was a mature ash with a broken off forked trunk with an impact shatter at 4m on the south west aspect that was open. This tree was not climbed due to health and safety reasons so retained the original ground-based classification of moderate suitability to support roosting bats.

Tree 72180_00116 was a large mature oak with multiple suitability roost features. Impact shatters were present at 5m on the south east aspect with entry into a limb. The shatter extended 40cm into a wedge-shaped cavity. There was no evidence of use by bats and the feature was considered to have moderate suitability for a single use transitional roost and had low suitability for small aggregations of bats in late summer or spring flux. A hazard beam on the south east aspect was full of substrate, with a 12cm ingress that was exposed at the top and a transverse snap at 11m on the northern aspect with a cavity that led into a wedge-shaped cone. Both offered little shelter and were classified as having low suitability to support roosting bats. One feature, a tear out at 7m on the southern aspect was considered to have moderate suitability to support roosting bats. The tree was confirmed to have moderate suitability to support roosting bats following aerial inspection.

Tree 72180_00108 was a mature willow with tear outs at 0.5m on the northern aspect with a cavity that did not extend more than 5cm upwards and extended laterally though the entire stem offering no shelter or protection from animals. An impact shatter at 1.5m on the north east aspect had a cavity that was found to be exposed and full of substrate. Both features were re-classified as having negligible suitability to support roosting bats. A tear out was also present at 1.5m on the north east aspect that extended down 30cm with a yellow stain and lichen growth. The hole did not extend upwards and had a lot of debris inside but offered some shelter. Aerial inspection confirmed this feature to have moderate suitability to support roosting bats. Overall this tree retained its ground-based classification of moderate suitability to support roosting bats.

Tree 72180_00114 was a mature alder with woodpecker holes at 4m and a knot hole at 4.8m, both on the south east aspect. The woodpecker hole extended 20cm downwards with a damp base and no upward ingress, this feature was re-classified as having low suitability to support roosting bats. The knot hole had a 30cm ingress into a conical horizontal apex and was full of woodlice. This feature retained its ground-based classification of moderate suitability to support roosting bats.

Tree 72180_00112 was a mature alder with large butt rot on the southern aspect that extended up into the tree. The cavity extended 70cm upwards in a conical shape and was smooth and dry inside. The feature was re-classified from high to moderate suitability to support roosting bats as there were limited opportunities for bats to hang on to.



Tree 72180_00113 was a mature alder with ivy covering. A tear out was present at 0.3m on the southern aspect that was found to have a frog inside. The cavity was smooth, clean and dry, 4cm wide and extended 50cm upwards. The feature was re-classified from moderate to having high suitability to support roosting bats.

Tree 72180_00110 was a mature willow next to a wet ditch with a knot hole at 4m and a tear out at 5m, both on the north east aspect. The knot hole was dry and smooth inside and connected to the tear out above, which had an entrance of 20cm diameter, extended downwards 1m in a conical shape and was clear, smooth and dry inside. Bird droppings and nesting material were recorded at the base. Both features were re-classified from moderate to high suitability to support roosting bats.

Tree 72180_00111 was a mature alder with numerous woodpecker holes growing at a field boundary. Butt rot was present on the southern aspect with a cavity which did not extend either up or down and had spongy rot above. This feature was downgraded to negligible suitability to support roosting bats. Eleven woodpecker holes were present along the northern aspect and three along the eastern aspect. This tree was not climbed due to health and safety reasons, so the woodpecker holes retained their ground-based classification of high suitability to support roosting bats.

Tree 72180_00109 was a mature alder with multiple impact shatters at 1.5m on the north east aspect with a crevice close to the main stem that extended 30cm laterally and had numerous cobwebs inside. Lifted bark around the shatter was found to lead nowhere and the feature was thought to offer little shelter and re-classified as having low suitability to support roosting bats. A tear out present at 0.5m on the northern aspect had a 30cm long entrance with a cavity that extended upwards into the tree. The bottom cavity was dry but full of leaf litter. The main cavity split into two, extended inwards 1m and down 30cm with some nesting material inside. The second cavity was smooth, 5cm wide and 30cm high. This feature was confirmed as having high suitability to support roosting bats

Table 35: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 72180

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
72180_00115	N/ GENDO	Down	Moderate	Negligible
72180_00105	Y	Down	Moderate	Negligible
72180_00107	Y	Down	Moderate	Low
72180_00106	N	No change	Moderate	Moderate
72180_00116	Y	No change	Moderate	Moderate
72180_00108	Y	No change	Moderate	Moderate
72180_00114	Y	No change	Moderate	Moderate
72180_00112	Y	Down	High	Moderate



72180_00113	Y	Up	Moderate	High
72180_00110	Y	Up	Moderate	High
72180_00111	N	No change	High	High
72180_00109	Y	No change	High	High

hh. Land Parcel 8200

The area is approximately 27.5 ha in size and contains a total of three trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 2nd October 2018.

Of these trees two were re-classified from moderate to low suitability (8200_122_01831 and 8200_122_01832) to support roosting bats and one maintained its ground-based classification of moderate suitability to support roosting bats (8200_122_01833).

Tree 8200_122_01831 was a mature alder with woodpecker holes at 8m height on the south east aspect. There were four holes in total and an additional two at 7m height on the north east aspect. Aerial survey re-classified the tree from moderate to low suitability to support roosting bats as the holes were found to be small and exposed, offering limited shelter (see photograph 124 below).

Tree 8200_122_01832 was a mature alder with two woodpecker holes at 5m and 6m height on the eastern aspect. Aerial survey re-classified the tree from moderate to low suitability to support roosting bats as the holes were found to be small and exposed, offering limited shelter (see photograph 125 below).

Tree 8200_122_01833 was a mature alder with butt rot at 1m height on the north east aspect, the rot ran up the whole main stem and was mostly open and exposed. There was a small cavity under the rotting heartwood that lead upwards 10cm and was dry but crumbly. This cavity was considered to have moderate suitability to support roosting bats. There was also a small secondary crevice at 4m height on the north east aspect and three woodpecker holes on the eastern aspect. Overall this tree was confirmed to have moderate suitability to support roosting bats (see photograph 126 below).

Table 36: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 8200

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
8200_122_01831	Y	Down	Moderate	Low
8200_122_01832	Y	Down	Moderate	Low
8200_122_01833	Y	No change	Moderate	Moderate



Survey Photographs of trees within Land Parcel 8200



Photograph 124: Tree 8200_122_01831, Land Parcel 8200, 02/10/2018, standard lens.



Photograph 125: Tree 8200_122_01832, Land Parcel 8200, 02/10/2018, standard lens.



Photograph 126: Tree
8200_122_01833, Land Parcel 8200,
02/10/2018, standard lens.

ii. Land Parcel 8850

The area is approximately 21.4ha in size and contains a total of eight trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out over the week commencing 17th September 2018.

A total of two trees were unable to be climbed due to health and safety reasons, one was not able to be assigned a suitability (8850_129_5) and one was considered to have high suitability (8850_129_3), both were recommended for emergence and re-entry surveys. Of the trees that were able to be climbed, or able to be inspected from the ground using an endoscopic camera, one was confirmed to have low suitability (8850_129_6), two were confirmed to have moderate suitability (8850_129_00010 and 8850_129_11), and three were confirmed to have high suitability (8850_129_20, 8850_129_7 and 8850_129_2/0890) to support roosting bats.

Tree 8850_129_00006 was a Sweet Chestnut with split bark up to 8m height. This tree was deemed unsafe to climb and recommended for emergence and re-entry surveys due to it not being possible to fully inspect the feature or assign a suitability classification to the tree.

Tree 8850_129_00007 was a Sweet Chestnut with a woodpecker test hole present at 5m on the western aspect. The feature extended 13cm horizontally with an entrance of 6cm diameter and was rough, clean and dry inside with some woodlice present. The feature was considered secure for only a single bat but was confirmed to have low suitability to support a bat roost.

Tree 8850_129_00009 was a Beech with a tear out present at 5m height on the western aspect. The entrance was 5cm wide with a 15cm internal diameter and extended upwards approximately 1m inside the tree. The feature was damp and dirty inside with woodlice and slugs present but was very secure and confirmed to have moderate suitability. A split was present 2.5m extending to 3m which was damp and dirty and only semi-secure, although it was considered to have roost potential behind the remaining heartwood. This tree was confirmed to have moderate suitability to support roosting bats following aerial inspection.

Tree 8850_129_00010 was a small Sweet Chestnut with a woodpecker hole at 3m height on the western aspect. This tree was not climbed due to its size and the presence of rotten wood at the base however the hole was inspected with an endoscope from the ground. The hole was dry and smooth with cobwebs and debris, it didn't extend upwards but extended downwards 15cm and was confirmed to have moderate suitability to support roosting bats following inspection.

Tree 8850_129_00001 was a Sweet Chestnut with the main stem split into tree that was deemed unsafe to climb and recommended for emergence and re-entry surveys as it was considered to have high suitability following the ground-based assessment.

Tree 8850_129_00002 was a Sweet Chestnut with a cavity present between the bark and hard wood where two calluses connect at 2m height on the southeast aspect. The feature extended



upwards 40cm with a chamber at the top and was dry, secure and sheltered but very dirty with debris and cobwebs inside. Overall this tree was confirmed to have high suitability to support roosting bats following aerial inspection.

Tree 8850_129_00008 was a Sweet Chestnut with multiple suitable roost features all on the north east aspect. Two knot holes present at 7m height were considered to have moderate suitability; both extended horizontally 20cm were dry, dusty with a rough surface and were semi-secure offering some shelter. A woodpecker hole was present at 10m height that had a dead bird inside and a lot of woodlice. This feature was considered to be temporarily negligible but could have high suitability by next year. A knot hole at 4m height extended into a woodpecker hole with an entrance of 8cm diameter. The feature extended upwards 10cm, 20cm horizontally and 20cm downwards and had a smooth bubbly surface and some dust and woodlice inside. This feature was considered to have high suitability for roosting bats. A tear out was present at 9m height extending into a hollow branch with an entrance 50cm wide and an internal width of 20cm. The feature was dry, smooth, secure and offered shelter. This feature and the tree were confirmed to have high suitability to support roosting bats following aerial inspection.

Tree 8850_129_00890 was a Scots Pine with three suitable roost features. A dead branch cavity with a 7cm diameter entrance extended approximately 1m horizontally inside and was dry with cobwebs but semi-exposed due to the presence of fissures on top. This feature was considered to have moderate suitability. Desiccation fissures present between 0-5m on both sides that could not be fully inspected due to it requiring a smaller endoscope head but was thought could have high suitability for a low number of bats. A decay cavity in a dead branch was present at 6m height on the southeast aspect that was dry and smooth inside, extended upwards 10cm and down 15cm with debris in the base. The feature was semi-exposed with a rough but clean surface and was considered to have high suitability. This tree was confirmed to have high suitability to support roosting bats following aerial inspection.

Table 38: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 8850

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
8850_129_00006	N	No change	N/A	N/A
8850_129_00007	Y	No change	Low	Low
8850_129_00009	Y	No change	Moderate	Moderate
8850_129_00010	N	No change	Moderate	Moderate
8850_129_00001	N	No change	High	High
8850_129_00002	Y	No change	High	High
8850_129_00008	Y	No change	High	High
8850_129_00890	Y	No change	High	High



jj. Land Parcel 8940

The area is approximately 153.6 ha in size and contains a total of 75 trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out over the week commencing 15th October 2018.

Five of the trees highlighted for further survey were not able to be inspected due to time constraints during aerial inspection surveys. These included; two mature oaks (8940_00011 and 8940_144_00581), an over-mature silver birch (8940_144_00578), and a mature silver birch (8940_00083) all thought to have moderate suitability, and a large, over-mature silver birch (8940_144_00577) thought to have high suitability to support roosting bats.

A total of 70 trees were visited during aerial surveys. A total of seven trees were identified that were considered unsafe to climb, so a full inspection of all features was not possible on the following trees: 8940_144_00580, 8940_00355, 8940_00353, 8940_144_U2, 8940_144_00586, 8940_00414 and 8940_144_00582. These trees were recommended for emergence and re-entry surveys in order to establish suitability and whether the tree was being used as a roost and retained their ground-based classifications of suitability.

Of the 63 trees for which a full updated survey was carried out:

- Seven trees were downgraded from moderate to negligible suitability to support roosting bats.
- 10 trees were downgraded from moderate to low suitability and two were downgraded from high to low suitability to support roosting bats.
- 14 trees retained their ground-based classification of moderate suitability, and five trees were downgraded from high to moderate suitability support roosting bats.
- Three trees were upgraded from moderate to high suitability and 20 trees retained their ground-based classification of high suitability to support roosting bats.
- Three roost trees were confirmed within this land parcel.

Tree 8940_00057 was a mature birch with wounds at 3m height on the southern aspect of the main stem that were found to be very exposed. This tree was downgraded to negligible suitability to support roosting bats.

Tree 8940_00424 was a mature oak tree with impact shatters on the main stem, however the cracks were only superficial, and the tree was considered to have negligible suitability to support roosting bats.

Tree 8940_00357 was a mature sweet chestnut thought to have moderate suitability to support roosting bats. However, there was no cavity when inspected during aerial survey, so this tree was downgraded to negligible suitability to support roosting bats.



Tree 8940_144_U6 was a mature oak with a knot hole on the northern aspect that was found to be open and exposed. This tree was considered to have negligible suitability to support roosting bats.

Tree 8940_144_00082 was a dead birch stump with birch polypore brackets growing on it. Woodpecker holes were present on the northern aspect however they were only test holes, offering negligible suitability and the tree was downgraded from moderate to negligible suitability to support roosting bats.

Tree 8940_144_U9 was a mature poplar with two main stems. Woodpecker holes were present at 8m height on the northern aspect but was found to be a test hole with negligible suitability to support roosting bats. This tree was downgraded from moderate to negligible suitability to support roosting bats.

Tree 8940_144_00567 was a mature holly with cankers present 2m high at the north east elevation and compression holes 0.5m high at the north east elevation. Inspection of the features showed them to be shallow and exposed and therefore, the tree was downgraded from moderate to negligible suitability to support roosting bats following aerial survey.

Tree 8940_144_U8 was a mature silver birch with woodpecker holes at 3m on the southern aspect. The hole was partly open and exposed offering limited shelter. This tree was downgraded from moderate to low suitability to support roosting bats following aerial survey.

Tree 8940_00422 was a mature oak with knot holes and wounds identified during the ground assessment. The knotholes were located at a height of 7m in the west aspect of the tree after examination no significant crevices were observed and the feature was only 2cm deep. The wounds located at the south west aspect of the tree were facing upward and were very shallow and exposed, furthermore loose bark was found to be occluding the feature. Therefore, this tree was considered to have low suitability to support roosting bats.

Tree 8940_00421 was a mature oak with woodpecker hole and knot holes. The woodpecker hole at the south elevation (8m height) were considered negligible as were going inwards for 9cm with a cone shape, the woodpecker hole was a test hole. The knot hole at the south east aspect of the tree extending upwards leaving a very open cavity with a rough surface, two crevices were recorded going into the heartwood. The entrance of the knot hole was 15x8cm retreating down to 13cm with no upward cavity inside, this feature was considered to have low potential to support roosting bats. The knot holes at the south west aspect of the tree had an upwards facing entrances with a rough surface, two crevices were recorded going into the heartwood and no upwards cavity was recorded, this cavity was considered to have low suitability to support roosting bats. Overall this tree was downgraded from high to low suitability to support roosting bats following aerial survey.

Tree 8940_144_00568 was a mature oak with pruning cuts at 4.5m and 7m on the south east aspect. The pruning cuts 4.5m high were 7cm deep and it was considered they offered no shelter; therefore, they were assessed as having low suitability to support roosting bats. Inspection of the upper pruning cuts showed that the heartwood was exposed and that there was no cavity and therefore, this feature was considered to have negligible suitability to support roosting bats. The tree was downgraded from moderate to low suitability to support roosting bats respectively.



Tree 8940_00358 was a mature sweet chestnut with a desiccation fissure at the top of the tree on a dead branch. On closer inspection this feature was open on both sides offering limited shelter. This tree was downgraded from moderate to low suitability to support roosting bats following aerial survey.

Tree 8940_144_U3 was a mature oak with pruning cuts and a tear out wound which were both downgraded to negligible suitability following aerial survey. A woodpecker hole was present at 7m height but was found to be small and offered little shelter. This tree was downgraded from moderate to low suitability to support roosting bats following aerial survey.

Tree 8940_144_U4 was a mature oak with woodpecker holes at 4m height on the southern aspect. The woodpecker hole extended 7cm horizontally and it was cluttered with debris and cobwebs, a small chamber was recorded at the end. Following aerial survey this feature was considered to have low suitability to support roosting bats and tree was downgraded from moderate to low suitability to support roosting bats.

Tree 8940_144_00583b was a mature oak with a limb tear with a pruning wound and a woodpecker hole at 8m on the south east aspect. The entrance of the woodpecker hole was 7cm in diameter and lead down 40 cm, nesting material was recorded in the base. It also led up 5 cm. This tree was downgraded from high to low suitability following aerial survey.

Tree 8940_00425 was a semi-mature multi-stemmed chestnut with a tear out wound at 5m on the eastern aspect that was downgraded to from moderate to low suitability to support roosting bats as it was considered that feature was too exposed.

Tree 8940_144_00572 was a mature oak with a large dead branch and a tear out wound at 2m and a large cavity in the trunk on the north east aspect that was downgraded to low suitability to support roosting bats in a small cavity, 2cm wide in the roof of the main hole which was otherwise dusty with brown rot. Overall this tree was downgraded from moderate to low suitability following aerial survey.

Tree 8940_144_00574 was a mature oak with pruning cuts and a tear out that were considered to offer low and negligible suitability to support roosting bats respectively. The pruning cuts didn't lead to any cavity and were therefore, considered to have negligible suitability to support roosting bats. The tear outs were open at the top and had no internal cavities and it was concluded that this feature had low potential to support roosting bats. This tree was downgraded from moderate to low suitability following aerial survey.

Tree 8940_144_00575 was a semi-mature oak with lots of woodpecker holes that were found to be only test holes on closer inspection. Lifted bark was present but had no cavity at the end and knot holes were open and offered limited shelter. This tree was downgraded from moderate to low suitability to support roosting bats following aerial survey.

Tree 8940_144_00582 was an over-mature oak with lifted bark along much of the main trunk that was considered to have moderate suitability to support roosting bats. This tree was not climbed due to health and safety reasons so was recommended for emergence and re-entry survey and retained its original classification of moderate suitability to support roosting bats.



Tree 8940_144_00580 was a dead oak with lifted bark at 7m and wounds present at 1m, both on the northern aspect. This tree was considered unsafe to climb so was recommended for emergence and re-entry survey and retained its ground-based classification of moderate suitability to support roosting bats.

Tree 8940_144_00584 was a mature willow with a transverse snap at 2.5m on the south east aspect of the main stem with a wedge apex, which was clean and dry inside with a rough surface. This tree was confirmed to have moderate suitability to support roosting bats following aerial survey.

Tree 8940_144_00571 included a group of two mature silver birch with a frost crack at 4.5m on the eastern aspect exposing heartwood, with lifted bark near the apex. This tree was downgraded from high to moderate suitability to support roosting bats. The feature lead upwards 15cm, was dry inside and mostly secure but had some debris.

Tree 8940_144_00563 was a mature oak with a tear out wound from 0.4m on the southern aspect that extends up into the tree but was an active hornets' nest at the time of survey. This feature was classified as having moderate potential to support roosting bats following ground-assessment and as hornets may not remain in the feature permanently retains its classification until further surveys. Pruning cuts were also present at 2.5m on the southern and north western aspects that that were found to be open, exposed and offer limited shelter and were downgraded from moderate to low and negligible respectively. Overall this tree was considered to have moderate suitability to support roosting bats.

Tree 8940_144_U2 was a mature oak tree with woodpecker holes at 4m on the main trunk, knot holes at 12m and a tear out at 15m. A hornet's nest was discovered during climbing, so the aerial survey was aborted for health and safety reasons. This tree retained its ground-based classification of moderate suitability to support roosting bats as a complete inspection could not be undertaken.

Tree 8940_00417 was a mature pine with a wound and exposed heartwood with a small opening at the base at 1m height on the eastern aspect. This tree was assessed as having moderate suitability as this is the second visit on which there was an active bees' nest within the feature, the feature will need to be re-inspected in a further visit.

Tree 8940_144_00570 was a mature silver birch with a frost crack from 1-3m on the northern aspect that was filled with debris at the apex but offered some shelter around occluded heartwood. This tree was downgraded from high to moderate suitability to support roosting bats following aerial survey.

Tree 8940_144_00569 that included a group of three silver birch with a woodpecker hole at 4.5m on the north east aspect that was found to be rotten and only 3cm deep, offering limited shelter. This feature was downgraded from high to low suitability. A frost crack was also present at 4m on the north east aspect that was 40cm long with occlusion wood with 3-4cm shelter on either side. This feature was downgraded from high to moderate suitability and the trees were considered to have moderate suitability to support roosting bats. This tree was recommended for emergence and re-entry surveys.



Tree 8940_00653 was a semi-mature rowan with wounds present on the main stem at 3m height on the south east aspect. The wound had an opening of 2x20cm, leading upwards in a hollow stem 35cm with a coned apex. The wound was smooth and dry with a small opening at the apex. This tree was confirmed to have moderate suitability to support roosting bats (see photograph 127 below).

Tree 8940_00940 was a mature birch with a wound at 1m height on the northern aspect. The wound lead upwards 15cm into a cone apex with an 8cm internal diameter and was clean, smooth and dry inside. This tree was confirmed to have moderate bat roost suitability following aerial inspection (see photograph 128 below).

Tree 8940_00033 was a dead birch that was not climbed due to health and safety reasons. Wounds and lifted bark were present between 1-5m on the main stem offering some shelter behind. This tree was confirmed to have moderate suitability to support roosting bats following aerial inspection (see photograph 129 below).

Tree 8940_00030 was a mature birch with a wound and large section of lifted bark at 0.2m on the north east aspect. This feature was inspected from the ground, the wound was dirty and low to the ground, however the bark plate was thought to offer some shelter and was considered to have moderate bat roost suitability. Overall this tree retained its original classification of moderate suitability following aerial inspection (see photograph 130 below).

Tree 8940_144_00565 was a mature sweet chestnut with lifted bark at 2m on the north west aspect that had moderate suitability to support roosting bats, leading upwards variable distances between 10-20cm across the sections with some debris and cobwebs present. This tree retained its original classification of moderate suitability to support roosting bats (see photographs 131 and 132 below).

Tree 8940_00415 was a mature oak with a tear out at 8m height on the north west aspect that was upwards facing and exposed upon closer inspection, with negligible suitability to support roosting bats. A pruning cut at 8m height on the north east aspect was very exposed at the end of the branch, with low bat roost suitability. A tear out between 3-7m on the north west aspect offered some shelter behind some of the heartwood but was varied in characteristic and considered to have moderate suitability to support only low numbers of bats. This tree was downgraded from high to moderate suitability following aerial inspection (see photograph 133 below).

Tree 8940_00416 was a mature beech tree with two suitability roost features considered to have moderate suitability to support roosting bats; damage from a lightning strike between 0-7m on the main stem which was damp inside and open at both ends with a sheltered area of 75cm, and a hollow limb extending east with a 20cm diameter entrance but found to be full of debris. Overall this tree was confirmed to have moderate suitability to support roosting bats following aerial inspection (see photograph 134 below).

Tree 8940_00042 was a mature two-stemmed rowan with butt-rot on the north west aspect of the northern stem. The feature extended upwards 90cm with a tapering apex and was clean and dry inside. This tree was confirmed to have moderate suitability to support roosting bats (see photograph 135 below).



Tree 8940_00053 was a mature oak tree with a woodpecker hole at 11m height on the southern aspect. This feature could not be inspected closely due to bees however, the tree was confirmed to have moderate suitability to support roosting bats (see photograph 136 below).

Tree 8940_00356 was a large mature oak with multiple suitability roost features. Four knot holes; one at 12m on the southern aspect, one at 7m on the northern aspect and two at 6m on the western aspect, were found to have suitable characteristics for bats. This tree was confirmed to have moderate suitability to support roosting bats (see photographs 137 and 138 below).

Tree 8940_00355 was a large dead tree that could not be identified to species. There were numerous woodpecker holes at 4m, 5m and 5.5m on the southern aspect of the main trunk. This tree could not be climbed due to health and safety reasons but was confirmed to have moderate suitability to support roosting bats (see photograph 139 below).

Tree 8940_00354 was a mature sweet chestnut with two hazard beams that were thought to have moderate suitability to support roosting bats; one at 7m on the southern aspect which was 100cm long with no cavities at either end, but dry and clean inside with suitability for a small number of bats, the other was at 7m on the southeast aspect which was a dead stub with cracks and two entrances to the main chamber. A knot hole at 7m on the southern aspect was inspected but was found to be shallow and exposed. Overall this tree was confirmed to have moderate suitability to support roosting bats (see photograph 140 below).

Tree 8940_00353 was a mature ash with knot holes and a tear out that appeared to have left a cavity in the trunk, both on the southern aspect. The tree could not be climbed due to health and safety reasons so retained its original classification of moderate suitability to support roosting bats (see photograph 141 below).

Tree 8940_00359 was a mature sweet chestnut with a knot hole at 7m height on the south west aspect of the main stem. This feature was an abandoned squirrel drey, extended upwards 7cm in a tight crevice leading to a conical apex and was dry inside. This tree was confirmed to have moderate suitability to support roosting bats following aerial inspection.

Tree 8940_00414 was a large dead oak with 5 woodpecker holes between 7-10m on the south west aspect that were considered to have high suitability to support roosting bats. The tree also had a tear out at 10m height on the south west aspect that was upward facing and considered to have moderate suitability to support roosting bats, and lifted bark that was revealed to offer only low suitability to support roosting bats. Due to the condition of this tree and health and safety constraints it was not possible to carry out a full inspection of all the features and the tree retained its original classification of high suitability to support roosting bats.

Tree 8940_00426 was a mature oak with wounds at 10m and 18m on the western aspect, the lower wound as considered to offer low suitability, the upper moderate as it had an entrance of 5x4cm an internal depth of 5cm and lead upwards 10cm and was dry and smooth inside with some staining. There were also knot holes present at 9.5m on the eastern aspect that was dirty and dusty inside, extended horizontally 40cm then lead upwards 15cm into a wedge chamber. This feature, and the tree overall was confirmed to have high suitability to support roosting bats.



Tree 8940_00419 was a semi-mature chestnut with lifted bark between 0.5-2.5m height on the north west aspect. There was a large plate of lifted bark with numerous tight entrances, extending horizontally 10cm and upwards 200cm. Underneath the bark was clean and dry. This tree was confirmed to have high suitability to support roosting bats.

Tree 8940_00418 was a semi-mature alder with a large wound on the easternmost stem. The feature extended upwards 60cm with a 2cm diameter and was dry, smooth and clean inside with a few crevices. This tree was confirmed to have high suitability to support roosting bats (see photograph 142 below).

Tree 8940_00360 was a mature oak with woodpecker holes present at 13m height on the north east aspect. This feature was considered to have high suitability to support roosting bats; the entrance was 5cm in diameter and the hole extended 30cm in to a dry, ridged, smooth cavity with a conical apex. The hole also extended 40cm downwards into an active squirrel drey, with a second entrance below it. Overall this tree was re-classified from moderate to high suitability to support roosting bats.

Tree 8940_144_U5 was a mature oak with multiple suitability roost features that were subject to aerial survey. The tree had a large number of pruning cuts at 6m height on all aspects, however these were found to have negligible suitability to support roosting bats, there was also lifted bark at 2m height on the north west aspect and a tear out at 8m height at the end of a branch, both of which were revealed to have low suitability to support roosting bats. A woodpecker hole at 4m height on the southern aspect was considered to have moderate suitability to support roosting bats, leading diagonally upwards 25cm and down 10cm behind heartwood. A knot hole from a pruning wound was also present at 10m height on the southern aspect that had a 6x4cm entrance, lead inwards 50cm and sloped diagonally upwards within the tree, offering high suitability to support roosting bats. Internally this feature was dry with secondary crevices. This tree was confirmed to have high suitability to support roosting bats (see photograph 143 below).

Tree 8940_144_U7 was a mature silver birch with a tear out hole that opened into a large hollow trunk at 2m height on the south west aspect. This feature extended upwards 60cm with a cone apex, and was smooth, dry and secure inside. This tree was confirmed to have high suitability to support roosting bats (see photograph 144 below).

Tree 8940_144_00586 was a dead pine. Ground assessment identified 6 woodpecker holes on the northern aspect. This tree was not able to be climbed due to health and safety reasons, so was recommended for emergence and re-entry surveys and retained its original classification of high suitability to support roosting bats.

Tree 8940_144_00579 was a mature oak with a large tear out from a branch at 5m height on the northern aspect, extending down to the ground. There was a large gap behind the heartwood at 8m that was clean and dry inside, leading up to a wedge apex. There was also a gap within the heartwood 150cm below which lead upwards 60cm but was very dirty internally. This feature was considered to have high suitability however, the surrounding vegetation was thought to block easy access and egress for bats. A knot hole was also present at 8m height on the north west aspect with a 7cm wide entrance that lead backwards 30cm, had a spire apex which lead upwards 40cm



and was clean and dry inside with secondary crevices present. The knot hole, and the tree overall, were confirmed to have high suitability to support roosting bats following aerial inspection.

Tree 8940_144_00907 was a mature oak with woodpecker holes at 6m height on the northern aspect. The hole was approximately 8x8cm at the entrance, extended back 30cm, lead upwards 150cm and 50cm downwards inside the trunk. Internally the hole was clean and dry with a bumpy surface. This tree was confirmed to have high suitability to support roosting bats.

Tree 8940_144_00908 was a mature oak with knot holes at 14m height on the western aspect of the main stem. There were numerous woodlice inside as well as an old wasp nest. The entrance was approximately 4x4cm. The substrate was bumpy with a spire apex, went upwards 12cm inside and was dry, sheltered and secure with high suitability to support roosting bats.

Tree 8940_144_00909 was a mature oak with a woodpecker hole present at 5m height on the western aspect. The hole had an entrance of 8x7cm, went backwards into the tree 10cm and upwards 15cm with a wedge apex. There were a few minor cobwebs inside, but this feature and the tree were confirmed to have high suitability to support roosting bats.

Tree 8940_144_00583a was a mature oak tree with multiple suitability roost features. Two woodpecker holes at 1m height, and a beech branch welded to a stem on the oak at 8m height, which created a small cavity, were both considered to have low bat roost suitability. A knot hole was present at 7m on the south east aspect with an entrance of 3x3cm, an internal width of 10cm but no extension up or down, it was dry and clean inside but very rough and was considered to have moderate suitability to support roosting bats. Three features were considered to have high bat roost suitability; lifted bark at 7m and woodpecker holes at 6.5m, both on the north east aspect, and woodpecker holes at 5m on the western aspect. The lifted bark had a small entrance of 1x3cm, went upwards 60cm and down 30cm with an internal width of 3cm going into a cone apex. Inside the lifted bark was dry, smooth and secure but with a tight entrance. The upper woodpecker hole had an entrance of 8x6cm, an internal width of 12cm it extended upwards 60cm and down 10cm with some disused nesting material at the base a bumpy inner surface but dry and secure towards the cone apex. The lower woodpecker hole had an entrance of 5x5cm, internal width of 15cm went up 30cm but not downwards and had 2 chambers inside with entrances next to each other. There were jagged stands of heartwood but inside was dry and secure. Overall this tree was confirmed to have high bat roost suitability.

Tree 8940_00428 was a mature chestnut with knot holes at 15m on the southern aspect of the main stem. These were found to have high bat roost suitability with an entrance of 7cm, leading backwards 16cm and up 20cm into a wedge apex. Secondary crevices were present, and the holes were smooth, dry and secure. Overall this tree was confirmed to have high suitability for roosting bats following aerial inspection.

Tree 8940_144_00576 was a mature oak with a large area of lifted bark at 3m and a large tear out at 7m both on the eastern aspect. Knot holes were also present at 7m on the northern aspect. The lifted bark extended 40cm upwards, was clean with a good clear drop zone and a number of other plates also had high suitability. The tear out was superficial and open on closer inspection and the



knot hole only extended 7cm downwards. Overall this tree was confirmed to have high bat roost suitability.

Tree 8940_144_00573 was a mature oak with multiple suitability roost features. Impact shatters were present at 4m height on the western aspect that had multiple crevices inside, woodpecker holes were present at 9m on the south west aspect that was clean inside, both were considered to have moderate suitability to support roosting bats. Two features were considered to have high suitability to support roosting bats; a tear out in a dead branch at 8m height on the southern aspect with an entrance of 10x12cm that extended inwards 11cm and upwards 40cm and a tear out at 7m on the south west aspect that had an entrance to the hard wood at the bottom, extended upwards 40cm narrowing into a wedge and was smooth with some debris and woodlice inside. This tree was confirmed to have high suitability to support roosting bats.

Tree 8940_00427 was a mature oak with multiple suitability roost features. Three features were considered to have moderate suitability to support roosting bats; a wound at 16m on the north west aspect that lead upwards 12cm with a wedge apex and was dry and secure, lifted bark at 15m on the north east aspect that offered secure shelter between the heartwood and the cambium, lead backwards 8cm and was clean and dry, and a tear out at 7m on the south east aspect that lead back 10cm behind the cambium a heartwood and was secure and dry. Two features were considered to have high bat roost suitability; an impact shatter at 8m on the north east aspect with an entrance at the top of a pruning cut, leading upwards 30cm to a wedged apex. There were multiple crevices which were all dry, smooth secure and sheltered. There were also woodpecker holes at 7m on the northern aspect with an entrance of 6x6cm which were damp at the base but dry above, leading upwards 30cm with a 25cm diameter within a hollow cavity which was smooth, clean and secure. Overall this tree was confirmed to have high bat roost suitability.

Tree 8940_00423 was a semi-mature ash with multiple suitability roost features. Two woodpecker holes, both at 12m on the northern and the eastern aspect were thought to have high suitability to support roosting bats. The hole on the northern aspect could not be accessed due to health and safety, but the one on the eastern aspect had a 4cm diameter, opening into multiple crevices extending up to 35cm and was dry, smooth, secure and sheltered internally. An excavated knot hole was also present at 8m height on the eastern aspect that had a 5x6cm opening, lead upwards up to 35cm through multiple crevices and was dry, smooth secure and sheltered. This tree was confirmed to have high suitability to support roosting bats.

Tree 8940_00420 was a mature oak with multiple suitability roost features. Although several of these features were downgraded to low or negligible suitability including: pruning cuts at 5m on the western aspect, tear outs at 7m and 9m respectively and an impact shatter at 12m on the north east aspect. An old limb tear out at 7m on the eastern aspect was considered to have moderate suitability to support roosting bats, it had an entrance of 3x10cm and extended 30cm inwards horizontally. There was old mammal nesting material at the base but inside was dry and secure. The age, species and character of this tree was considered justification to confirm a high bat roost suitability grade.



Tree 8940_00657 was a mature poplar with two woodpecker holes present at 3m on the south east aspect leading into the same cavity within the tree with some nesting material separating them. These holes were considered to have high bat roost suitability and the top hole extended upwards 100cm with a dome apex and was clean, dry, smooth and secure inside. This tree was confirmed to have an overall high suitability.

Tree 8940_00659 was a very large, mature multi-stem beech with multiple suitability roost features that was considered to have high bat roost suitability. Three features were downgraded to low or negligible suitability; wounds at 8m were found to be open and dirty and wounds at 11m and 12m were found to offer limited shelter. Three features were considered to have high bat roost suitability; woodpecker holes at 5m and at 6.5m, both on the eastern aspect that lead upwards 70cm and back 25cm with a tapered wedge apex. There was also a wound at 6m height on the eastern aspect with a narrow entrance that extended upwards 35cm and was smooth and dry inside. Overall this tree was confirmed to have high bat roost suitability.

Tree 8940_00036 was a mature twin-stemmed beech with frost crack present at 2.5m on the southern aspect. The left crack was considered to have high bat roost suitability, leading upwards 60cm into a cone apex and was dry, smooth and clean inside. The right crack offered only limited shelter. Overall this tree was confirmed to have high bat roost suitability.

Tree 8940_00656 was a mature oak with multiple suitability roost features and high bat roost suitability. One feature, a wound at 9.5m was downgraded to low suitability, four wounds were found to have moderate bat roost suitability: at 12m on the southeast aspect with a 4cm entrance which lead upwards 20cm behind the heartwood into a dry wedge apex, at 11m on the north west aspect that lead upwards 15cm into a dome apex offering shelter around a callous, at 11m on the eastern aspect with an entrance of 5x4cm that lead upwards 10cm and downwards 12cm with a dome apex and at 8m on the eastern aspect with an entrance of 8x4cm which extended backwards 12cm and upwards 20cm with a dome apex. One feature was considered to have high bat roost suitability; a wound present at 8m on the southern aspect with two gaps through an entrance of 3x15cm which extended upwards 30cm and 50cm respectively between the heartwood and a callous roll. Internally the surface was bumpy, and the gaps had a dome apex. Overall this tree was confirmed to have high suitability to support roosting bats.

Tree 8940_00052 was a mature birch with a canker at 2m height on the north west aspect of the main stem that led upwards 80cm into a cone apex and was smooth, clean and dry inside with minor fungal growth. This tree was upgraded from moderate to high suitability to support roosting bats following aerial inspection.

Tree 8940_144_00585b was a silver birch with a frost crack extending from the ground to 5m height on the west aspect of the main stem. The crack had an opening of 6cm and lead upwards 90cm tapering at the top and was sheltered and secure but with numerous woodlice at the base. This tree was confirmed to have high suitability to support roosting bats (see photograph 146 below).

Tree 8940_144_00564 was a mature pine with 8 woodpecker holes between 6m and 7m on the north east aspect one with secondary crevices that extended upwards 6cm, one with possible droppings in the base that extended upwards 25cm with an entrance of 6x7cm and evidence of



scratching around the entrance. These features were considered to have high suitability to support roosting bats. There were also six wounds present at 6m on the north west aspect that were downgraded to negligible suitability to support roosting bats. During emergence and re-entry surveys this tree was confirmed as a roost tree.

Tree 8940_144_00585a is a silver birch with frost cracks extending from the ground to 5m height on the north east aspect of the main stem. The frost crack lead upwards 40cm inside the tree tapering into a cone apex and was dry and smooth inside. This tree was previously confirmed as a roost (see photograph 145 below).

Tree 8940_144_U1 was a mature oak with three features that were highlighted for aerial survey. Two of the features; a pruning cut with rot behind and a woodpecker test hole were found to have negligible suitability to support roosting bats. A brown long-eared *Plecotus auratus* was discovered within a cavity in a woodpecker hole at 6m height on the eastern aspect. The cavity was clean, smooth and dry with some woodlice at the bottom. Due to the discovery of a bat within the tree, this tree is a confirmed roost (see photograph 147 and 148 below).

Table 39: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 8940

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
8940_00057	Y	Down	Moderate	Negligible
8940_00424	Y	Down	Moderate	Negligible
8940_00357	Y	Down	Moderate	Negligible
8940_144_U6	Y	Down	Moderate	Negligible
8940_144_00082	Y	Down	Moderate	Negligible
8940_144_U9	Y	Down	Moderate	Negligible
8940_144_00567	Y	Down	Moderate	Negligible
8940_144_U8	Y	Down	Moderate	Low
8940_00422	Y	Down	Moderate	Low
8940_00421	y	Down	High	Low
8940_144_00568	Y	Down	Moderate	Low
8940_00358	Y	Down	Moderate	Low
8940_144_U3	Y	Down	Moderate	Low
8940_144_U4	Y	Down	Moderate	Low
8940_144_00583b	Y	Down	High	Low
8940_00425	Y	Down	Moderate	Low
8940_144_00572	Y	Down	Moderate	Low
8940_144_00574	Y	Down	Moderate	Low



8940_144_00575	Y	Down	Moderate	Low
8940_144_00563	Y	No change	Moderate	Moderate
8940_144_U2	N Aborted - Hornet nest	No change	Moderate	Moderate
8940_00417	Y	No change	Moderate	Moderate
8940_144_00582	N H&S	No change	Moderate	Moderate
8940_144_00580	N H&S	No change	Moderate	Moderate
8940_144_00584	Y	No change	Moderate	Moderate
8940_144_00571	Y	Down	High	Moderate
8940_144_00570	Y	Down	High	Moderate
8940_144_00569	Y	Down	High	Moderate
8940_00653	Y	No change	Moderate	Moderate
8940_00940	Y	No change	Moderate	Moderate
8940_00033	GENDO	No change	Moderate	Moderate
8940_00030	Y	No change	Moderate	Moderate
8940_144_00565	Y	No change	Moderate	Moderate
8940_00415	Y	Down	High	Moderate
8940_00416	Y	Down	High	Moderate
8940_00042	Y	No change	Moderate	Moderate
8940_00053	Y	No change	Moderate	Moderate
8940_00356	Y	No change	Moderate	Moderate
8940_00355	N H&S	No change	Moderate	Moderate
8940_00354	Y	No change	Moderate	Moderate
8940_00353	N H&S	No change	Moderate	Moderate
8940_00359	Y	No change	Moderate	Moderate
8940_00414	N H&S	No change	High	High
8940_00426	Y	No change	High	High
8940_00419	Y	No change	High	High
8940_00418	Y	No change	High	High
8940_00360	Y	Up	Moderate	High
8940_144_U5	Y	No change	High	High
8940_144_U7	Y	No change	High	High
8940_144_00586	N H&S	No change	High	High
8940_144_00579	Y	No change	High	High
8940_144_00907	Y	No change	High	High
8940_144_00908	Y	No change	High	High
8940_144_00909	Y	No change	High	High
8940_144_00583a	Y	No change	High	High



8940_00428	Y	Up	Moderate	High
8940_144_00576	Y	No change	High	High
8940_144_00573	Y	No change	High	High
8940_00427	Y	No change	High	High
8940_00423	Y	No change	High	High
8940_00420	Y	No change	High	High
8940_00657	Y	No change	High	High
8940_00659	Y	No change	High	High
8940_00036	Y	No change	High	High
8940_00656	Y	No change	High	High
8940_00052	Y	Up	Moderate	High
8940_144_00585b	Y	No change	High	High
8940_144_00564	Y	Up	High	Confirmed Roost
8940_144_00585a	Y	No change	Confirmed Roost	Confirmed Roost
8940_144_U1	Y	Up	High	Confirmed Roost

Survey Photographs of trees within Land Parcel 8940



Photograph 127: Tree 8940_00653, Land Parcel 8940, 17/10/2018, standard lens.



Photograph 128: Tree 8940_00940, Land Parcel 8940, 18/10/2018, standard lens.



Photograph 129: Tree 8940_00033, Land Parcel 8940, 18/10/2018, standard lens.

Photograph 130: Tree 8940_00030, Land Parcel 8940, 18/10/2018, standard lens.

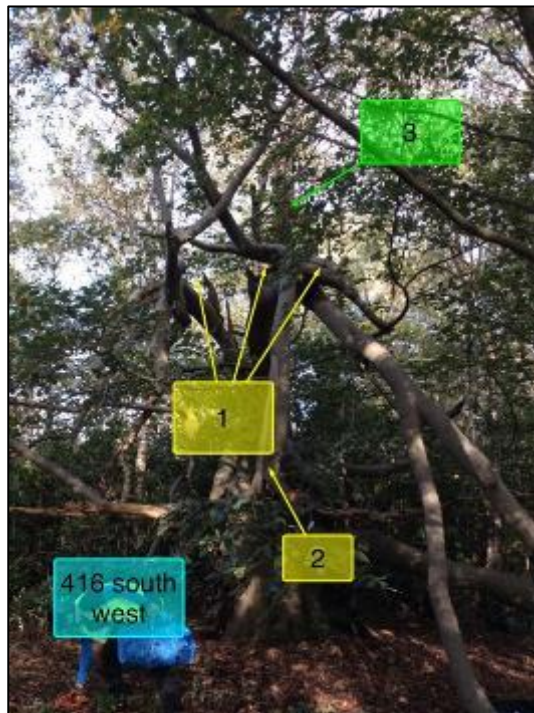
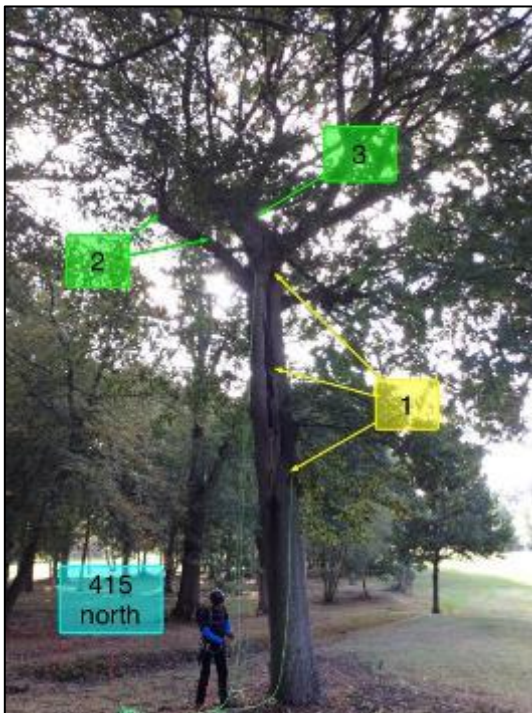




Photograph 131: Tree 8940_144_00565 from the northern aspect, Land Parcel 8940, 11/09/2018, standard lens.



Photograph 132: Tree 8940_144_00565 from the southern aspect, Land Parcel 8940, 11/09/2018, standard lens.



Photograph 133: Tree 8940_00415, Land Parcel 8940, 18/10/2018, standard lens.



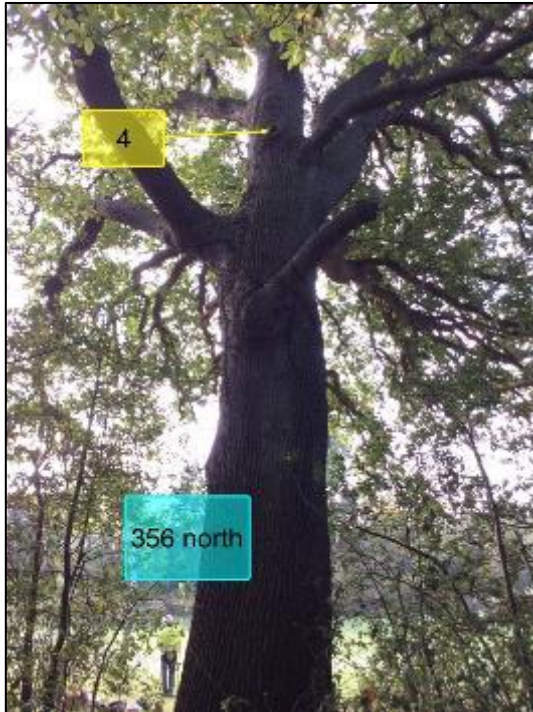
Photograph 134: Tree 8940_00416, Land Parcel 8940, 18/10/2018, standard lens.



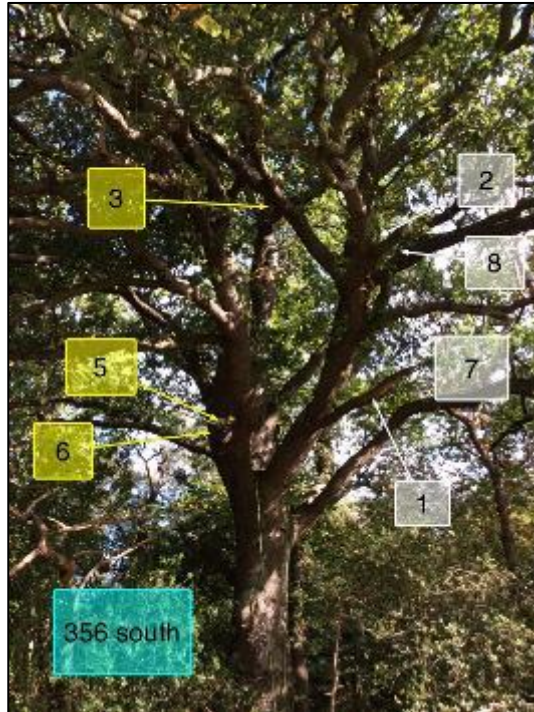
Photograph 135: Tree 8940_00042, Land Parcel 8940, 18/10/2018, standard lens.

Photograph 136: Tree 8940_00053, Land Parcel 8940, 18/10/2018, standard lens.





Photograph 137: Tree 8940_00356 northern aspect, Land Parcel 8940, 19/10/2018, standard lens.



Photograph 138: Tree 8940_00356 southern aspect, Land Parcel 8940, 19/10/2018, standard lens.



Photograph 139: Tree 8940_00355,



Photograph 140: Tree 8940_00354,



Land Parcel 8940, 19/10/2018, standard lens.



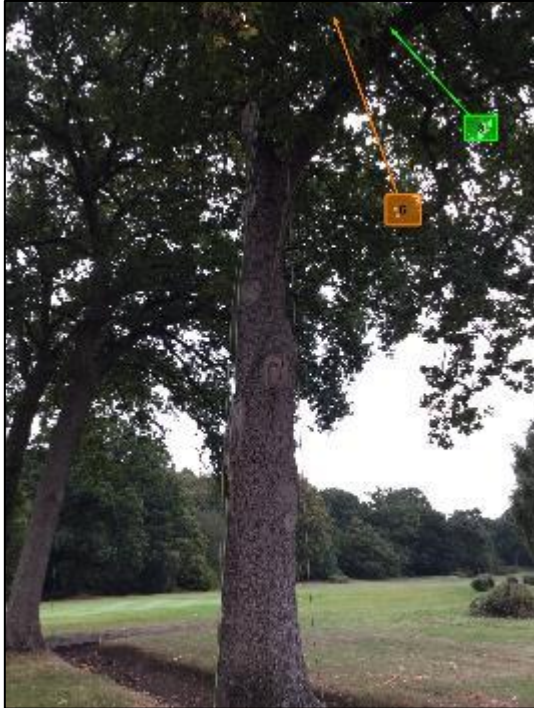
Photograph 141: Tree 8940_00353, Land Parcel 8940, 19/10/2018, standard lens.

Land Parcel 8940, 19/10/2018, standard lens.



Photograph 142: Tree 8940_00418, Land Parcel 8940, 18/10/2018, standard lens.





Photograph 143: Tree 8940_144_U5, Land Parcel 8940, 12/09/2018, standard lens.



Photograph 144: Tree 8940_144_U7, Land Parcel 8940, 12/09/2018, standard lens.



Photograph 145: Tree 940_144_00585a, Land Parcel 8940, 11/09/2018, standard lens.



Photograph 147: Tree 8940_144_U1 showing brown long-eared bat *Plecotus auratus* inside a cavity within a woodpecker hole at 6m on the eastern aspect (the red box labelled number 2 in photograph 148), Land Parcel 8940, 12/09/2018, standard lens.

Photograph 146: 8940_144_00585b, Land Parcel 8940, 11/09/2018, standard lens.



Photograph 148: Tree 8940_144_U1, Land Parcel 8940, 12/09/2018, standard lens.

kk. Land Parcel 9020

The area is approximately 2.2 ha in size and contains a total of 1 tree that was highlighted for further survey, following the initial Ground-Based Bat Risk Assessment (GBBRA) survey. Aerial surveys were carried out on the 9th September 2018.

Tree 9020_145_00843 was a mature silver birch with a split leading into a cavity at 3m height on the northern aspect. The feature lead upwards 80cm inside the tree with a spire apex and the lower section was smooth. There was an old wasps' nest, numerous woodlice and a lot of debris inside. Overall this tree was confirmed to have moderate suitability to support roosting bats following aerial inspection (see photograph 149 below).

Table 40: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 9020

Tree ID	Climbed (Y/N)	Re-classified? (up down)	Original Classification following GBBRA	Classification after aerial inspection



		or no change)		
9020_145_00843	Y	No change	Moderate	Moderate

Survey Photograph of tree within Land Parcel 9020



Photograph 149: Tree 9020_145_00843, Land Parcel 9020, 09/09/2018, standard lens.

II. Land Parcel 9060

The area is approximately 9.9 ha in size and contains a total of four trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 9th and 12th September 2018.

Of the trees surveyed in this land parcel, three retained their original ground-based classification of moderate suitability (9060_147_00966, 9060_147_00967 and 9060_147_00844) and one tree retained its ground-based classification of high suitability (9060_145_00845) to support roosting bats following aerial inspection.

Tree 9060_147_00966 was a mature willow with large knot holes at 1.5m height on the western aspect that open into the same cavity. The cavity extended upwards 80cm and downwards more than 100cm with an internal width of 40cm, narrowing towards the top. Inside were secondary crevices, the feature was dry, there were old cobwebs, debris and the sides of the feature were



rough. Overall this tree was considered to have moderate suitability to support roosting bats (see photograph 150 below).

Tree 9060_147_00967 was a mature willow with woodpecker holes at 14m height on the northern aspect. The feature was moderately open and at the time of survey was a squirrel drey with squirrel's present. The entrance was 7cm wide and internally the feature went up 6cm, down 10cm, inwards 25cm was dome shaped and clean. This tree was considered to have moderate suitability to support roosting bats (see photograph 151 below).

Tree 9060_147_00844 was a mature silver birch with multiple woodpecker holes at 6m height on the eastern aspect of the main stem. This tree was considered to have moderate suitability to support roosting bats.

Tree 9060_145_00845 was a mature sweet chestnut with multiple suitability roost features. Numerous woodpecker holes were present at 1m, 3m, 6m, 7m and 8m on the main stem and on branches. There was also a knot hole present at 8m on the southern aspect and multiple cavities in the base of the tree. Overall this tree was considered to have high suitability to support roosting bats.

Table 41: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 9060

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
9060_147_00966	Y	No change	Moderate	Moderate
9060_147_00967	Y	No change	Moderate	Moderate
9060_145_00844	Y	No change	Moderate	Moderate
9060_145_00845	Y	No change	High	High

Survey Photographs of trees within Land Parcel 9060





Photograph 150: Tree 9060_147_00966, Land Parcel 9060, 12/09/2018, standard lens.



Photograph 151: Tree 9060_147_00967, Land Parcel 9060, 12/09/2018, standard lens.

mm. Land Parcel 9240

The area is approximately 32.7 ha in size and contains a total of eight trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 25th September 2018.

Four of the trees highlighted for aerial surveys were unable to be climbed due to health and safety reasons. These included three trees that were considered to have high suitability to support roosting bats based on ground assessment surveys: A mature willow (tree 9240_00867 – see photograph 152 below) with five knot holes at various heights and a hazard beam; A mature silver birch (tree 9240_00868 – see photograph 153 below) with a large butt rot cavity, a knot hole, and an open wound; And a mature oak (tree 9240_00871 – see photograph 154 below) with six knot holes at various heights, a pruning cut and an impact shatter. Another tree that was deemed unsafe to climb was a mature willow (tree 9240_00870) with a tear out feature at 6m height and a transverse snap at 5m which was considered to have moderate suitability to support roosting bats.

Of the remaining trees within this land parcel, one was not able to be fully inspected so retained its ground-based classification of moderate suitability (9240_00873), one tree was downgraded from moderate to low suitability (9240_00872) and one tree was re-classified from moderate to high suitability (9240_00874), and one tree retained its original classification of high suitability (9240_00875) to support roosting bats following aerial inspection.



Tree 9240_00873 was a mature silver birch that was considered to have moderate suitability to support roosting bats based on ground assessment results. Aerial surveys were not possible due to health and safety reasons, however the feature, two knot holes at 4m height on the north east aspect, were inspected with a high-powered torch. Although the holes were open and exposed offering little shelter for bats they couldn't be fully inspected, therefore, the tree kept its ground-based classification of moderate suitability to support roosting bats (see photograph 155 below).

Tree 9240_00872 was a group of mature willow trees comprising six trunks in total. Although considered to have moderate suitability to support roosting bats from GBBRA surveys, aerial inspection of three features; a tear out hole at 4m, a hazard beam at 5m and impact shatters from a snapped branch at 7m height re-classified the tree from having moderate to low suitability to support roosting bats (see photograph 156 below). The tear outs offered very limited shelter as they only led 5cm into the tree, the hazard beams were freshly split and offered limited shelter, and the impact shatters were considered to have negligible suitability to support roosting bats.

Tree 9240_00874 was a mature willow tree with two features that were subject to aerial survey. One feature, a fissure at 5m height on the eastern aspect that was revealed to have only negligible suitability to support roosting bats. A wound at 2m height on the southern aspect was considered to have high suitability to support a transitional bat roost. The entrance was 3cm diameter and extended upwards 30cm with an inner diameter of 3cm, inside the feature was dirty but smooth. Overall this tree was re-classified from moderate to high suitability to support roosting bats following aerial inspection (see photograph 157 below).

Tree 9240_00875 was a mature willow with a tear out at 2m height on the north west aspect. Aerial surveys revealed the feature lead upwards 10cm and another suitability roost feature was present under the heartwood which lead upwards 15cm. Inside both features were dry and secure with some slugs and millipedes present at the base. Overall this tree was confirmed to have high suitability to support roosting bats following aerial inspection (see photograph 158 below).

Table 42: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 9240

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
9240_00872	Y	Down	Moderate	Low
9240_00873	N	No change	Moderate	Moderate
9240_00874	Y	Down	Moderate	High
9240_00875	Y	No change	High	High

Survey Photograph of tree within Land Parcel 9240





Photograph 152: Tree 9240_00867, Land Parcel 9240, 25/09/2018, standard lens.



Photograph 153: Tree 9240_00868, Land Parcel 9240, 25/09/2018, standard lens.



Photograph 154: Tree 9240_00871, Land Parcel 9240, 25/09/2018, standard lens.



Photograph 155: Tree 9240_00873, Land Parcel 9240, 25/09/2018, standard lens.





Photograph 156: Tree 9240_00872, Land Parcel 9240, 25/09/2018, standard lens.



Photograph 157: Tree 9240_00874, Land Parcel 9240, 25/09/2018, standard lens.



Photograph 158: Tree 9240_00875, Land Parcel 9240, 25/09/2018, standard lens.



nn. Land Parcel 11300

This land parcel falls within an urban setting between Ashford and Staines upon Thames and comprises Fordbridge Park and some of the surrounding area. The area is approximately 4.8 ha in size and contains a total of three trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on 5th September 2018.

A total of one tree was re-classified from moderate to negligible suitability (11300_00895), one was re-classified from moderate to low suitability (11300_00894) and one retained its ground-based classification of high suitability (11300_00893) to support roosting bats following aerial assessment.

Tree 11300_00895 was a mature silver birch with wounds present at 4m height on the northwest aspect. This tree was downgraded from moderate to negligible suitability to support roosting bats following aerial inspections which revealed the hole to be open and exposed, offering very little shelter (see photograph 159 below).

Tree 11300_00894 was a mature silver birch with wounds at 4.5m height on the north east aspect. The wound was created by a stem tear, however following aerial inspections it was re-classified from moderate to low suitability to support roosting bats as it had two upper openings and several crevices. There was some feather/ down material present at the base, but the hole offered very limited shelter (see photograph 160 below).

Tree 11300_00893 was a mature poplar with high suitability to support roosting bats. This tree had three features that were inspected during aerial surveys; an old limb wound know hole at approximately 6m height on the northwest aspect with nesting material in the base, a knot hole on the western aspect at 4m height leading into a stem cavity and a wound at 4m height on the southern aspect. The old limb know hole was thought to have moderate suitability to support roosting bats as it led upwards 10cm with 2 egress points, there was fungus present at the entrance and bird nesting material at the base. The knot hole on the western aspect was considered to have moderate suitability to support roosting bats as it led upwards 20cm but had a lot of debris and was dusty within. Lastly, the wound on the southern aspect was considered to have high suitability to support roosting bats as it led upwards 20cm and was smooth and dry within. Overall this tree was confirmed to have high suitability to support roosting bats (see photograph 161 below).

Table 43: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 11300

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
11300_00895	Y	Down	Moderate	Negligible
11300_00894	Y	Down	Moderate	Low



11300_00893	Y	No change	High	High
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Survey Photograph of tree within Land Parcel 11300

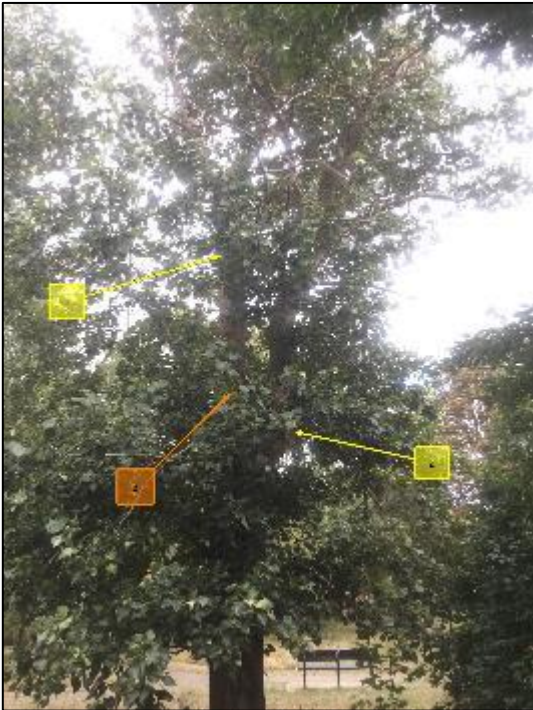


Photograph 159: Tree 11300_00895, Land Parcel 11300, 05/09/2018, standard lens.



Photograph 160: Tree 11300_00894, Land Parcel 11300, 05/09/2018, standard lens.





Photograph 161: Tree 11300_00893, Land Parcel 11300, 05/09/2018, standard lens.

oo. Land Parcel 10530

The area is approximately 0.9 ha in size and contains a total of seven trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 5th September 2018.

A total of two trees were re-classified from high to moderate suitability (10530_00901 and 10530_00899), one retained its original classification of moderate suitability (10530_00896) and four trees retained their original classification of high suitability (10530_00902, 10530_00900, 10530_00898 and 10530_00897) to support roosting bats following aerial inspection.

Tree 10530_00901 was a mature horse chestnut with wounds visible at 16m height on the southern aspect of the main stem at the base of a branch. The tree was considered to have moderate suitability to support roosting bats due to the hole leading downwards 50cm with a flat apex and a cone-shaped base. There was a large woodlouse nest at the base (see photograph 162 below).

Tree 10530_00899 was a mature twin stem ash with two features that were highlighted for aerial inspection. A wound recorded at 12m height on the south east aspect was thought to have moderate suitability to support roosting bats. This feature had an entrance of 10x5cm and extended inwards 15cm. Internally the feature extended upwards via a little chimney of 7cm diameter, going inwards 4cm and downwards 50cm. There were woodlice at the base but inside the feature was smooth, dry and clean. The second feature was a knot hole at 6.5m height on the south west aspect at the end of a low branch. This feature was considered to have moderate suitability to support

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roosting bats with an entrance of 2x2cm and extending inwards 15cm towards the stem but was found to be dirty and damp inside. Overall this tree was considered to have moderate suitability to support roosting bats.

Tree 10530_00896 was a mature hazel sp. with a single feature, a wound in the stem at 1.1m height on the north west aspect. This feature lead upwards 1m with crumbly substrate and was covered in cobwebs which were cleared out after the first survey. Although the feature was secure and sheltered, it was damp inside and there were some slugs and cobwebs at the apex. Overall this tree was considered to have moderate suitability to support roosting bats (see photograph 163 below).

Tree 10530_00902 was a mature horse chestnut with wounds present on the main stem at 4m height on the western aspect. This tree was not climbed due to health and safety reasons. Initial surveys considered the feature to have high suitability to support roosting bats, so the tree was recommended for emergence and re-entry surveys (see photograph 164 below).

Tree 10530_00900 was a mature twin stem ash with two wound holes that were subject to aerial survey. One wound on the lowest branch at 6m height on the southern aspect was thought to have high suitability to support roosting bats, the hole was 7x7cm at the entrance with an internal width of 20cm. The feature extended outwards from the stem 2cm and in towards the stem 80cm. Internally this feature was smooth, clean and dry. The second wound was on one of the top stems, at 15m height on the southern aspect. This feature was thought to have moderate suitability to support roosting bats, with an entrance of 10x5cm and an internal width of 15cm. The feature went upwards 5cm with a chambered top and extended 20cm downwards. Internally the feature was dry and smooth but there were some woodlice at the base as well as some nesting material. Overall this tree was considered to have high suitability to support roosting bats (see photograph 165 below).

Tree 10530_00898 was a mature poplar tree with four features that were subject to aerial survey. A knot hole present at 13m height on the east aspect was downgraded to low suitability as it was open at the top, lead downwards only and offered limited shelter. Two knot holes were considered to have moderate suitability to support roosting bats; both were on the north west aspect, one at 11.5m height and one at 12m height. The higher knot hole was on the base of a snapped branch on the main stem, went upwards 8cm with a wedge apex within the tree, but was covered with cobwebs. The lower knot hole was on a vertical branch from the main stem, lead downwards 40cm within the tree and was very exposed with some debris and numerous earwigs, however it led 25cm upwards to a vertical dead branch. A knot hole at 10m height on the south west aspect of the secondary stem was considered to have high suitability to support roosting bats. This feature was a squirrel drain with a chambered edge apex and lead upwards 40cm with a few slugs and woodlice within. Overall this tree was considered to have high suitability to support roosting bats (see photograph 166 below).

Tree 10530_00897 was a mature silver birch with two features that were subject to aerial survey. A stem cavity was present at 2.2m height on the south west aspect that was considered to have high suitability to support roosting bats. This feature had an entrance of 40x10cm and extended



horizontally inwards 20cm, then extended upwards 90cm with an internal width of 7cm going up to a wedge apex. Internally this feature was damp and dirty with slugs' present, the substrate was rough, dirty and damp with some cobwebs present at the time of survey. The second feature, a knot hole at 5m height on the south east aspect was found to be very open, offering little shelter and was full of leaf litter. This feature was considered to have low suitability to support roosting bats. Overall this tree was considered to have high suitability to support roosting bats (see photograph 167 below).

Table 44: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 10530

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
10530_00901	Y	Down	High	Moderate
10530_00899	Y	Down	High	Moderate
10530_00896	Y	No change	Moderate	Moderate
10530_00902	N	No change	High	High
10530_00900	Y	No change	High	High
10530_00898	Y	No change	High	High
10530_00897	Y	No change	High	High

Survey Photograph of tree within Land Parcel 10530





Photograph 162: Tree 10530_00901, Land Parcel 10530, 05/09/2018, standard lens.



Photograph 163: Tree 10530_00896, Land Parcel 10530, 05/09/2018, standard lens.

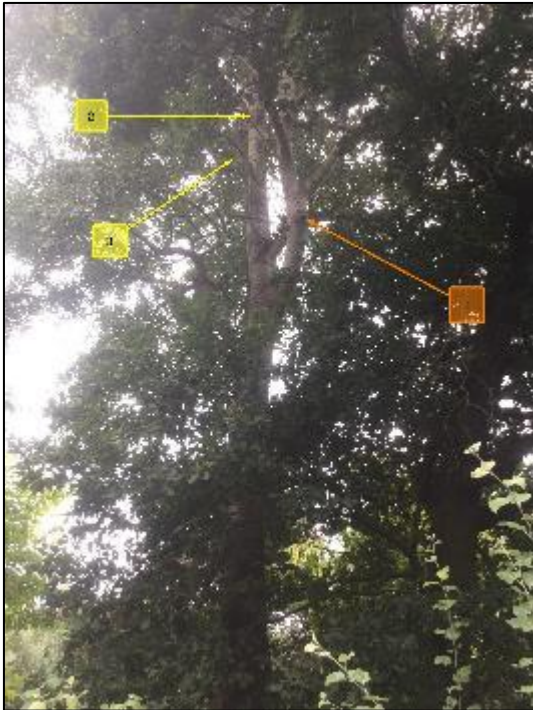


Photograph 164: Tree 10530_00902, Land Parcel 10530, 05/09/2018, standard lens.



Photograph 165: Tree 10530_00900, Land Parcel 10530, 05/09/2018, standard lens.





Photograph 166: Tree 10530_00898, Land Parcel 10530, 05/09/2018, standard lens.



Photograph 167: Tree 10530_00897, Land Parcel 10530, 05/09/2018, standard lens.

pp. Land Parcel 10230

The area is approximately 1.2 ha in size and contains a total of two trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 6th September 2018.

Both trees retained their original classifications; one was confirmed to have moderate suitability (102300_00904) and one was confirmed to have high suitability (10230_00903) to support roosting bats following aerial inspections.

Tree 10230_00904 was a mature oak tree with two features that were subject to aerial survey. The first, a large wound at 7m height on the eastern aspect, was found to have low suitability to support roosting bats as it was a largely open wound with bird feathers inside, offering limited shelter. The second feature was a woodpecker hole at 3m height on the northern aspect. This feature was considered to have moderate suitability to support roosting bats as it led backwards 50cm into the stem and was dry and dusty inside, offering good shelter. Overall this tree was considered to have moderate suitability to support roosting bats (see photograph 168 below).

Tree 10230_00903 was a mature oak tree with 7 features that were subject to aerial survey. Four of these features were considered to have low suitability to support roosting bats upon closer inspection; a wound at 6m height on the northern aspect, a pruning cut at 7m height on the east aspect, a knot hole at 8m height on the south east aspect and a pruning cut at 5m height on the northern aspect which was a cavity facing the stem with good features for birds nesting but too big

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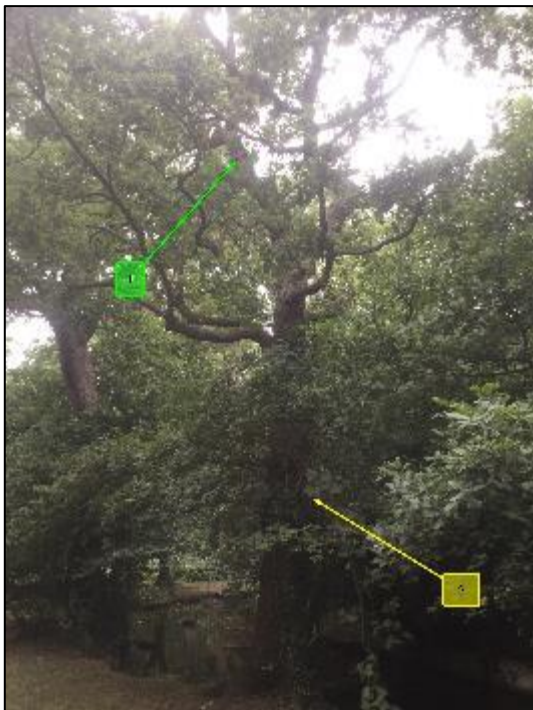


for roosting bats. Two features were considered to have moderate suitability to support roosting bats; knot holes present at 2.5m height on the south aspect and at 3m height on the south east aspect. Lastly, a woodpecker hole present at 6m height on the northern aspect was considered to have high suitability to support roosting bats; the hole was on a branch over a stream and faced downwards, the entrance was 7x7cm with an internal width of 8cm. The feature went 15cm in towards the stem and 3cm away from the stem. Internally there was some debris the substrate was smooth, dry and mostly clean. Overall this tree was considered to have high suitability to support roosting bats (see photograph 169 and 170 below).

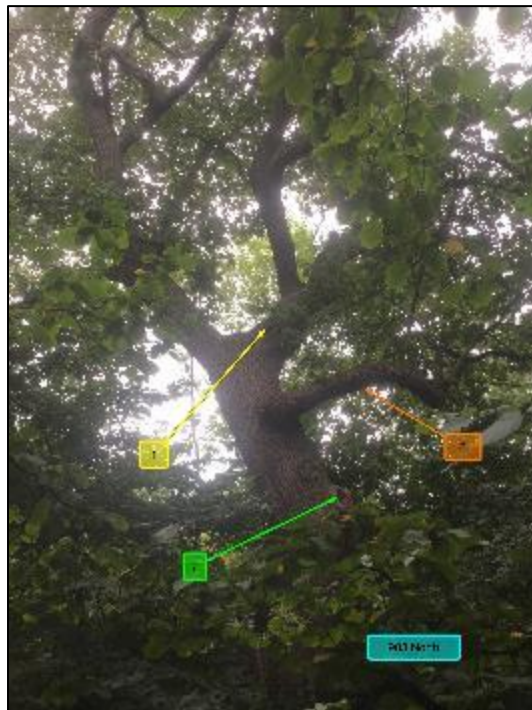
Table 45: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 10230

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
10230_00904	Y	No change	Moderate	Moderate
10230_00903	Y	No change	High	High

Survey Photograph of tree within Land Parcel 10230

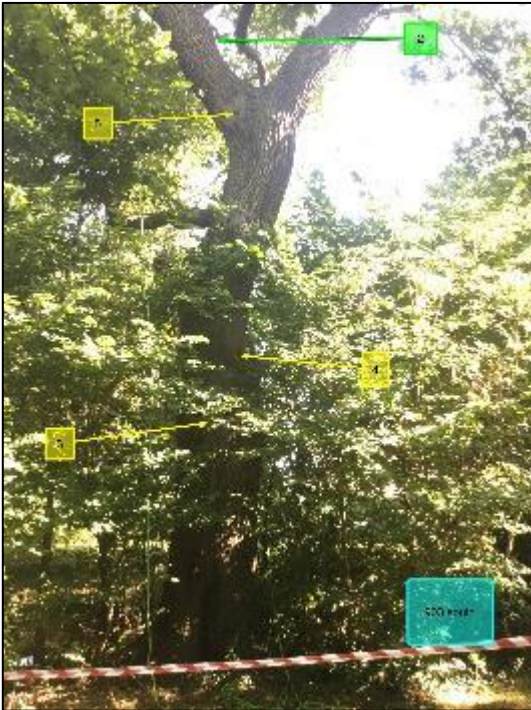


Photograph 168: Tree 10230_00904, Land Parcel 10230, 06/09/2018, standard lens.



Photograph 169: Tree 10230_00903 northern aspect, Land Parcel 10230, 06/09/2018, standard lens.





Photograph 170: Tree 10230_00903 southern aspect, Land Parcel 10230, 06/09/2018, standard lens.

qq. Land Parcel 10300

The area is approximately 0.9 ha in size and contains a total of two trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on the 6th September 2018. One tree was re-classified from high to moderate suitability (10300_00892) and one retained its ground-based classification of high suitability (10300_00891) to support roosting bats following aerial inspection.

Tree 10300_00892 was a mature weeping willow with three suitability roost features that were subject to aerial survey. The first, a woodpecker hole at 10m height on the south aspect was only very shallow on closer inspection and had negligible suitability to support roosting bats. The second was a tear out at 10m height on the south aspect which was callousing around the wound. Upon closer inspection this feature was thought to be a test woodpecker hole and considered to have low suitability to support roosting bats. A knot hole at 4.5m height on the south aspect on a damaged limb was thought to have moderate suitability to support roosting bats; it was 5cm wide at the entrance and lead diagonally downwards 30cm. Internally this feature was dry, dusty and smooth with some nesting material at the base. Overall this tree was re-classified from high to moderate suitability to support roosting bats (see photograph 171 below).

Tree 10300_00891 was a mature weeping willow with three features that were subject to aerial survey. A wound located at 5.5m height on the southwest aspect where the branches fork was

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found to be very open, offering limited shelter and considered to have low suitability to support roosting bats. A second feature was a transverse snap, a snapped limb at 4.5m height on the southeast aspect. This feature lead inwards 60cm but got increasingly narrow further in, it was partly open but very secure, so was considered t have moderate suitability to support roosting bats. Lastly, a desiccation fissure, a hollow cavity within the limb located at 7m height on the south west aspect was considered to have high suitability to support roosting bats. This feature had an entrance of 10x5cm and extended upwards 15cm into a clean chamber. Internally the feature was smooth, dry and secure. A secondary egress was present extending backwards 40cm which was dry, smooth and clean internally. Overall this tree was confirmed to have high suitability to support roosting bats (see photograph 172 below).

Table 46: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 10300

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
10300_00892	Y	Down	High	Moderate
10300_00891	Y	No change	High	High

Survey Photograph of tree within Land Parcel 10300



Photograph 171: Tree 10300_00892, Land Parcel 10300, 06/09/2018, standard lens.

Photograph 172: Tree 10300_00891, Land Parcel 10300, 06/09/2018, standard lens.

rr. Land Parcel 12540

This land parcel is comprised of parkland with scattered trees and lies within the urban town of Ashford, immediately north of Hitchcock and King Ashford industrial park. The land parcel is bordered by the B378 to the north and east and Stanwell road to the west. Beyond lies further urban residential housing to the west and south and two large areas open grassland with large waterbodies; Bedfont Lakes country park to the east and Staines reservoirs to the north, with Ashford Park and Shortwood common to the west. These waterbodies could represent high quality foraging habitats for bats.

The area is approximately 0.7 ha in size and contains a total of two trees that were highlighted for further surveys, following the initial GBBRA survey. Aerial surveys were carried out on 6th September 2018. One tree retained its ground-based classification of moderate suitability (12540_00906) and one tree was re-classified from high to moderate suitability (12540_00905) to support roosting bats following aerial inspection.

Tree 12540_00905 was a mature poplar with several woodpecker holes at 12m height on the eastern aspect. The aerial inspection inspected three holes; the top one was open and exposed with negligible suitability to support roosting bats, the middle hole was dry and lead downwards 20cm inside the tree with moderate bat roost suitability and the third hole was revealed to be an active squirrel drey. Overall this tree was re-classified from high to moderate suitability to support roosting bats (see photograph 173 below).

Tree 12540_00906 was a mature horse chestnut with a wound hole at 2m height on the eastern aspect. The hole was inspected with an endoscope from the ground and was found to lead upwards 40cm within the tree with a wedge apex, the inside was damp, and cobwebs were present. This feature was thought to have moderate suitability, and the tree retained its ground-based classification of moderate suitability to support roosting bats (see photograph 174 below).

Table 47: Summary table of changes in tree classification of suitability following aerial survey for Land Parcel 102540

Tree ID	Climbed (Y/N)	Re-classified? (up down or no change)	Original Classification following GBBRA	Classification after aerial inspection
12540_00905	Y	Down	High	Moderate
12540_00906	Y	No	Moderate	Moderate

Survey Photograph of tree within Section H, Land Parcel 12540

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Photograph 173: Tree 12540_00905, Land Parcel 12540, 06/09/2018, standard lens.



Photograph 174: Tree 12540_00906, Land Parcel 12540, 06/09/2018, standard lens.



4 Evaluation and Conclusion

All species of bat present in the UK receive full protection under The Conservation of Habitats and Species Regulations 2017, and the Wildlife and Countryside Act 1981 (as amended).

The surveys carried out over the months of August-October 2018 assessed a total of 299 trees and included aerial inspections or inspection from the ground using an endoscopic camera of 263 trees in total.

A total of 38 trees were confirmed as having negligible suitability to support roosting bats. These trees do not require further survey and are not considered to pose any constraint on the preferred pipeline route.

A total of 51 trees were confirmed to have low suitability to support roosting bats. Trees classified as having low suitability are unlikely to support bat roosts and therefore the loss of these trees is unlikely to have major negative impacts on local bat populations. However, due to the possibility of bats roosting within these trees, in line with Bat Conservation Trust Guidelines (Collins 2016), it is recommended that they should be felled (if felling is required) following a precautionary approach.

The precautionary approach refers to a technique of felling the tree which involves soft felling of all limbs with potential bat roost features. Each feature and limb should be carefully lowered to the ground and inspected by a licenced bat ecologist. The licenced ecologist should be present to supervise all works. The precautionary approach is a method used to minimise risk of injury or death to any bats that may be roosting within the tree.

A total of 89 trees were considered to have moderate suitability to support roosting bats and a total of 80 trees were considered to have high suitability to support roosting bats. If the felling of any of these trees is required, they should be subject to emergence and re-entry surveys in order to confirm if they are current roost trees. Following emergence and re-entry surveys, trees that are not found to support a bat roost should be felled following the precautionary approach.

Five confirmed roost trees were identified. These trees were supporting bat roosts at the time of survey. A European Protected Species Mitigation Licence will be required in order to carry out felling works on confirmed roost trees.

Given that bats are highly mobile animals and may use a variety of roosts within the landscape at different times of year, it is likely that by the time construction works are due to commence, many of the roost locations and features will have changed and an updated survey may be required.



5 REFERENCES

Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd Edition*. Bat Conservation Trust, London.

Mitchell-Jones A.J (2004) *Bat Mitigation Guidelines*. English Nature.

Mitchell-Jones A.J. and McLeish A.P. (2004) *The Bat Workers Manual 3rd Edition*. Joint Nature Conservation Committee.



APPENDIX 1: Figures

Figure 1: Land Parcel 180

Figure 2: Land Parcel 200

Figure 3: Land Parcels 420, 441 & 440

Figure 4: Land Parcel 461

Figure 5: Land Parcel 22360 & 681

Figure 6: Land Parcels 720 & 740

Figure 7: Land Parcels 802, 820 & 840

Figure 8: Land Parcel 24460

Figure 9: Land Parcel 1050

Figure 10: Land Parcel 1110

Figure 11: Land Parcel 1340

Figure 12: Land Parcel 1210

Figure 13: Land Parcels 27970 & 1431

Figure 14: Land Parcel 1970

Figure 15: Land Parcel 2280

Figure 16: Land Parcel 2380

Figure 17: Land Parcel 2820

Figure 18: Land Parcel 3980

Figure 19: Land Parcel 3230 & 3200

Figure 20: Land Parcels 4120 & 4450

Figure 21: Land Parcel 4390

Figure 22: Land Parcel 5050

Figure 23: Land Parcel 5960

Figure 24: Land Parcel 7790

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info@arbeco.co.uk www.arbeco.co.uk

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Figure 25: Land Parcel 8000

Figure 26: Land Parcels 72180 & 8150

Figure 27: Land Parcel 8200

Figure 28: Land Parcel 8850

Figure 29: Land Parcel 8940

Figure 30: Land Parcels 9020 & 9060

Figure 31: Land Parcel 9240

Figure 32 Land Parcels 11300, 10530, 10230 & 10300

Figure 33: Land Parcels 12540



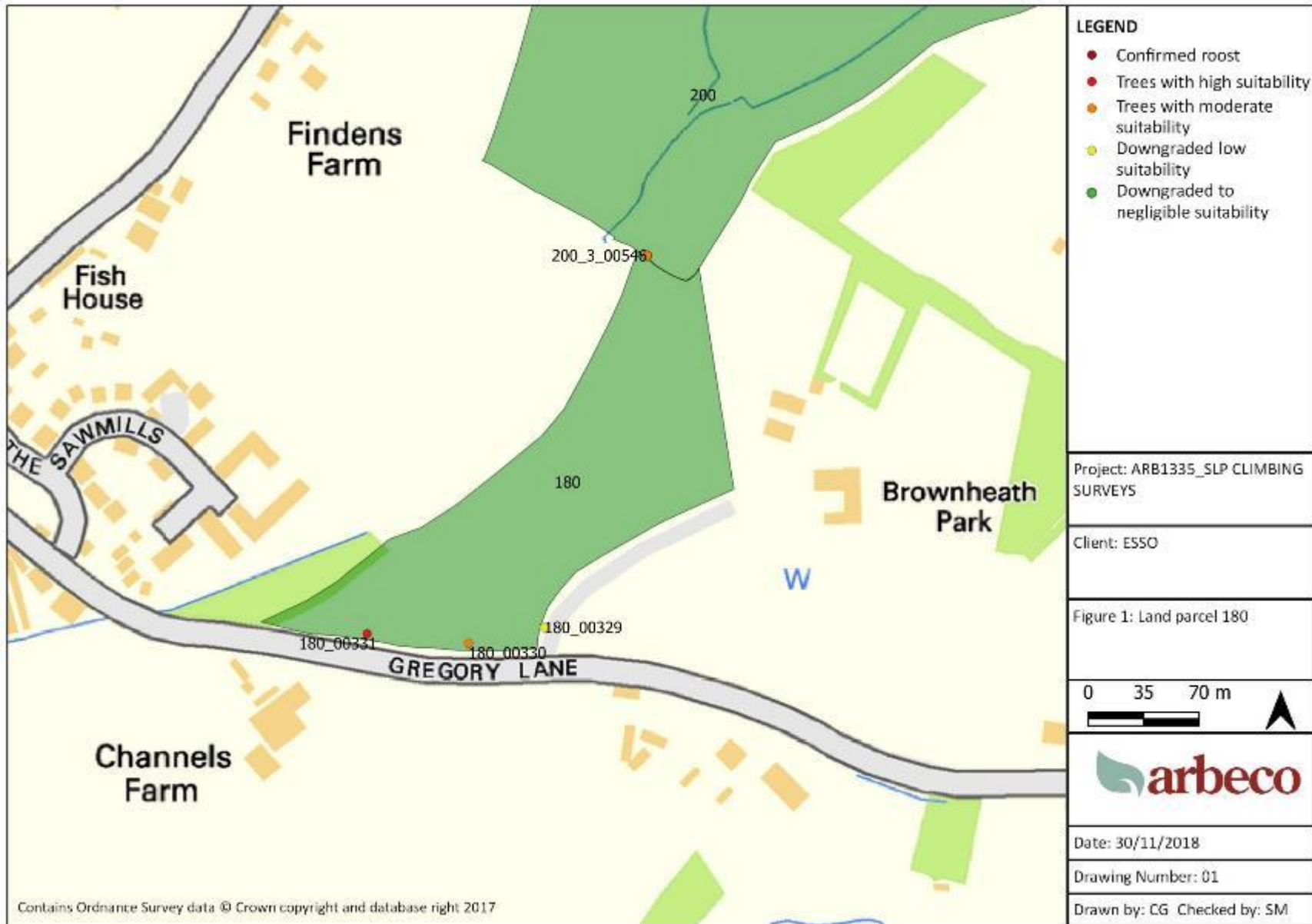


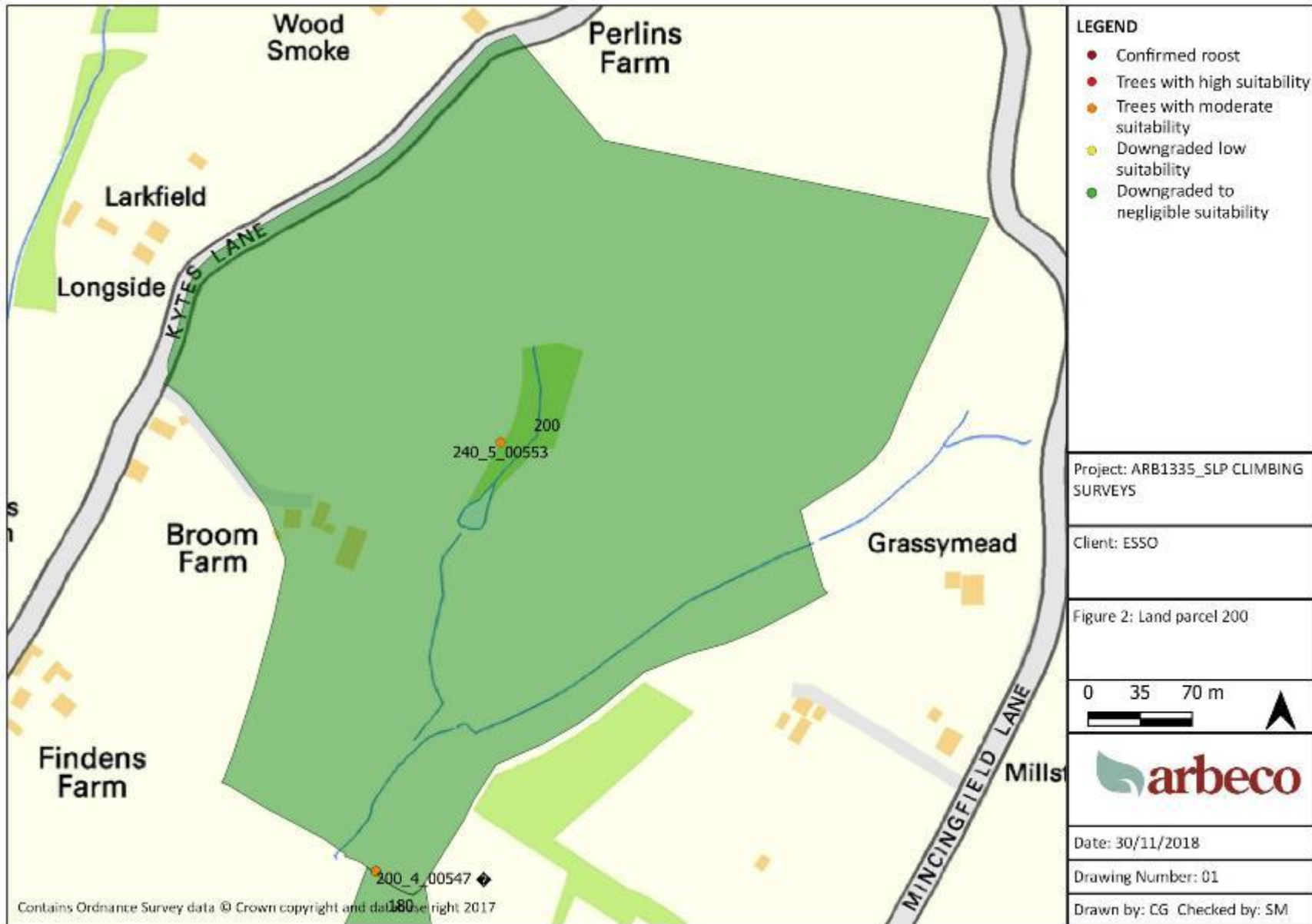
Figures

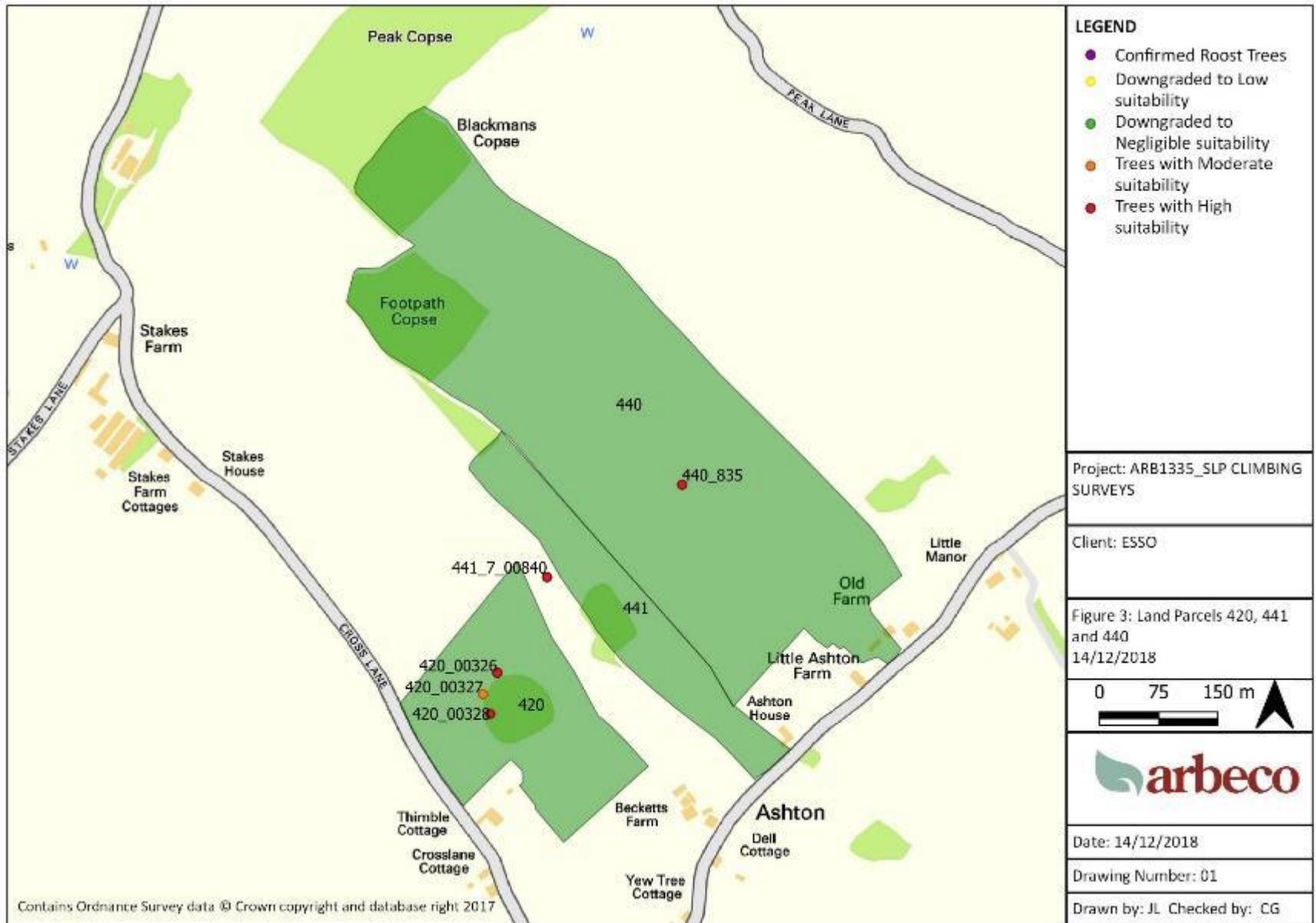
Figure A7.7.1: Desk study and bat index

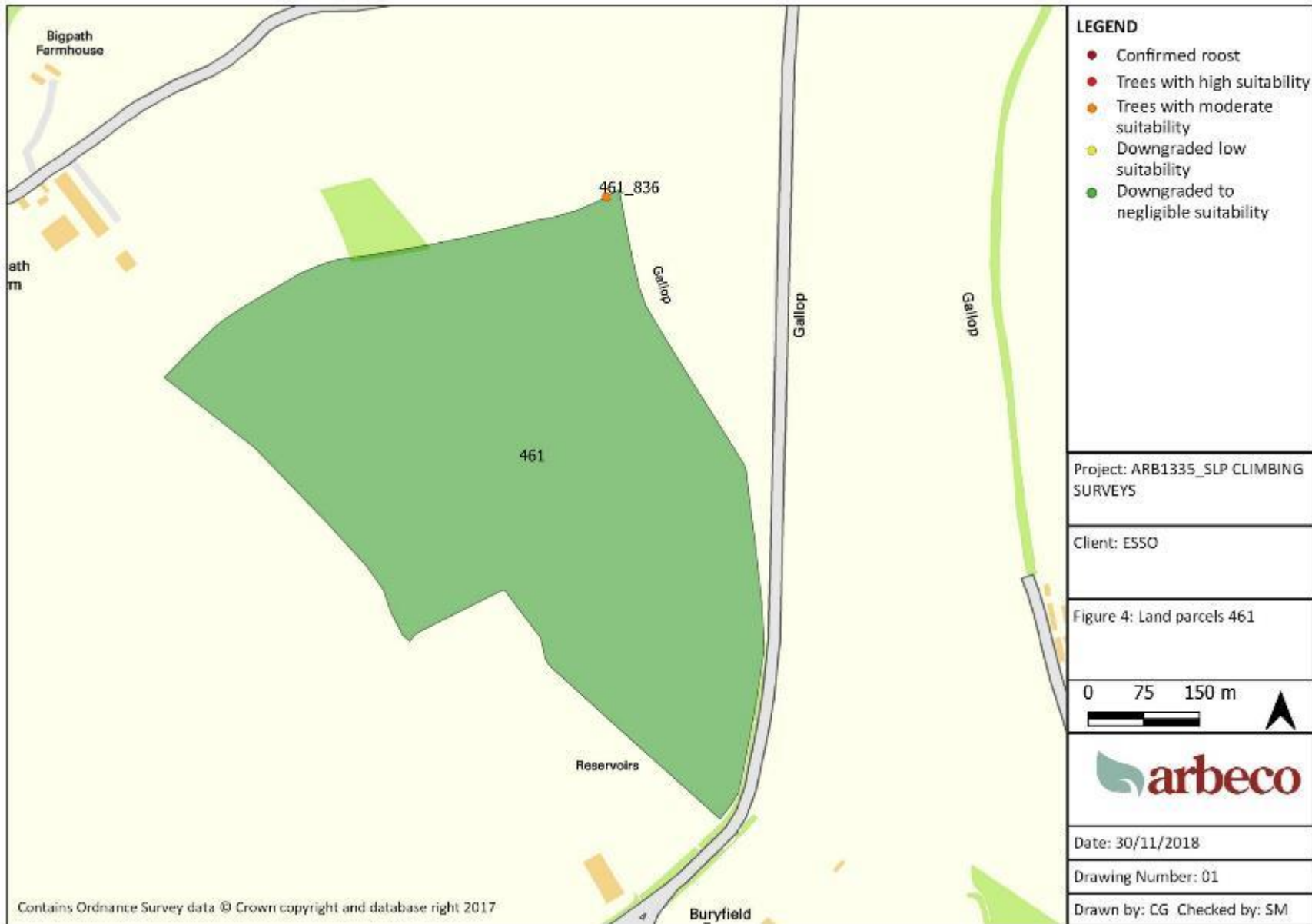
Figure A7.7.2: Field survey results post climbing surveys

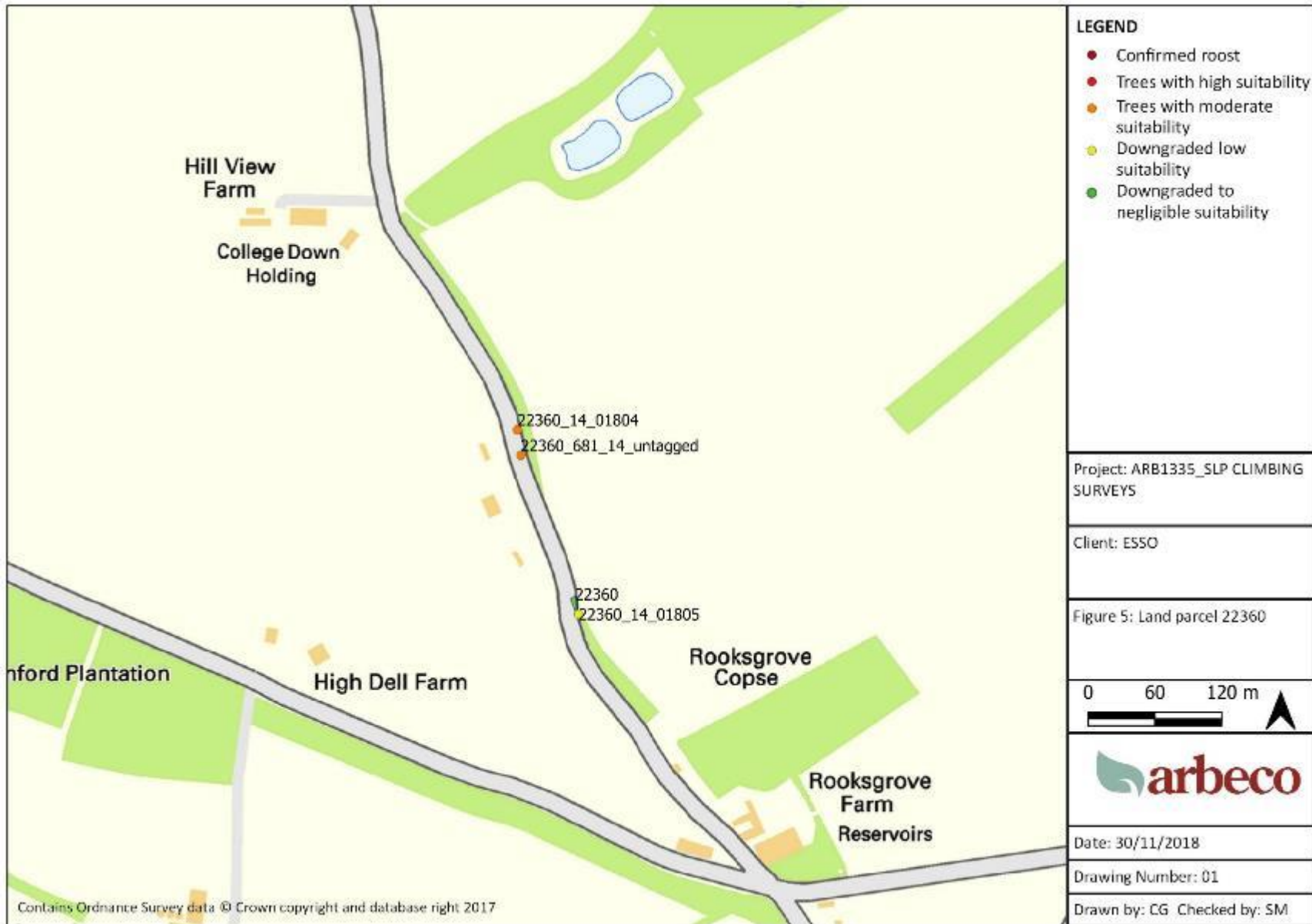
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LEGEND

- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 6: Land Parcels 720 and 740
14/12/2018

0 75 150 m



Date: 14/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG



LEGEND

- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

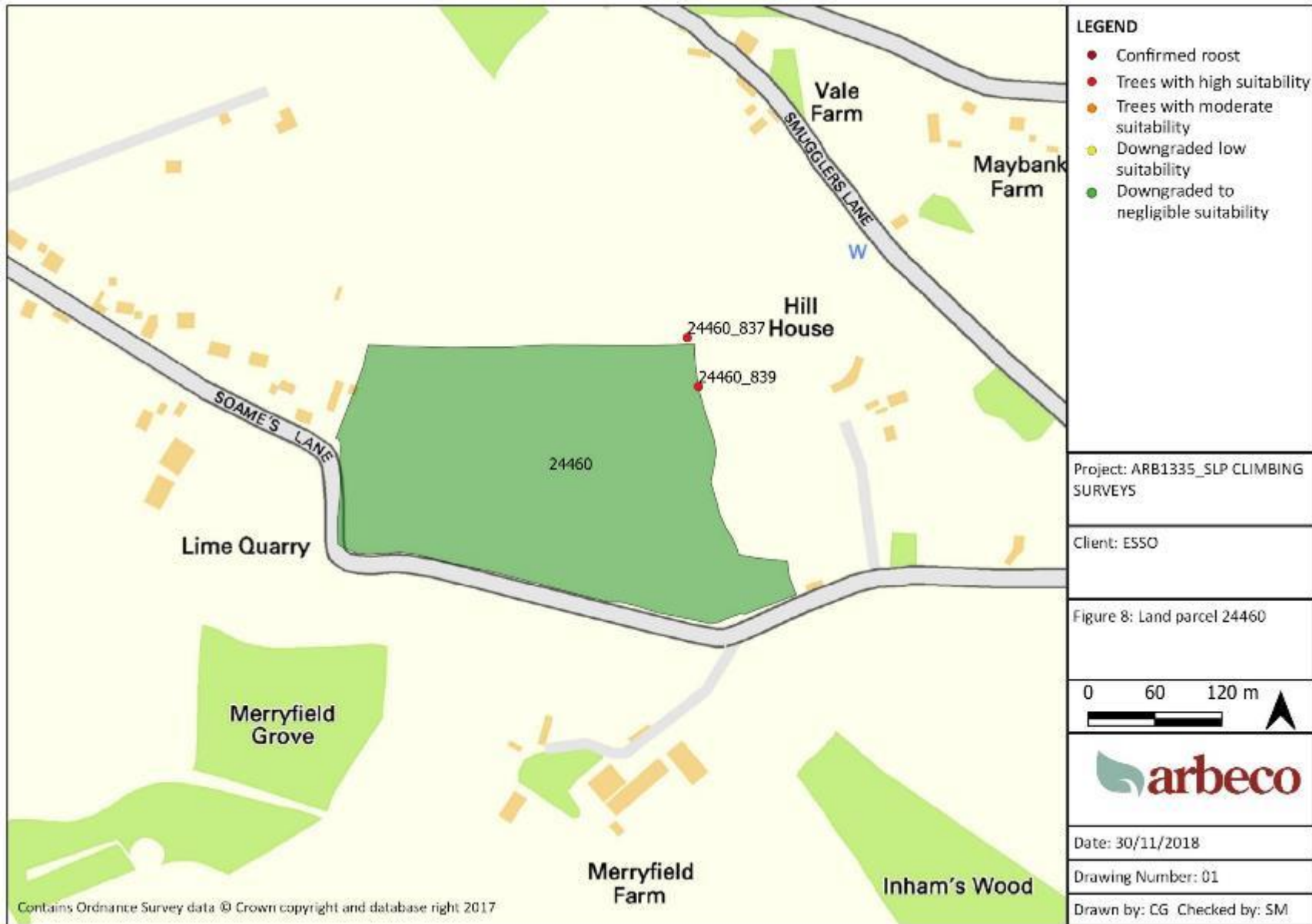
Figure 7: Land Parcels 802, 820 and 840
14/12/2018



Date: 14/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG






LEGEND


- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 9: Land Parcel 1050
14/12/2018

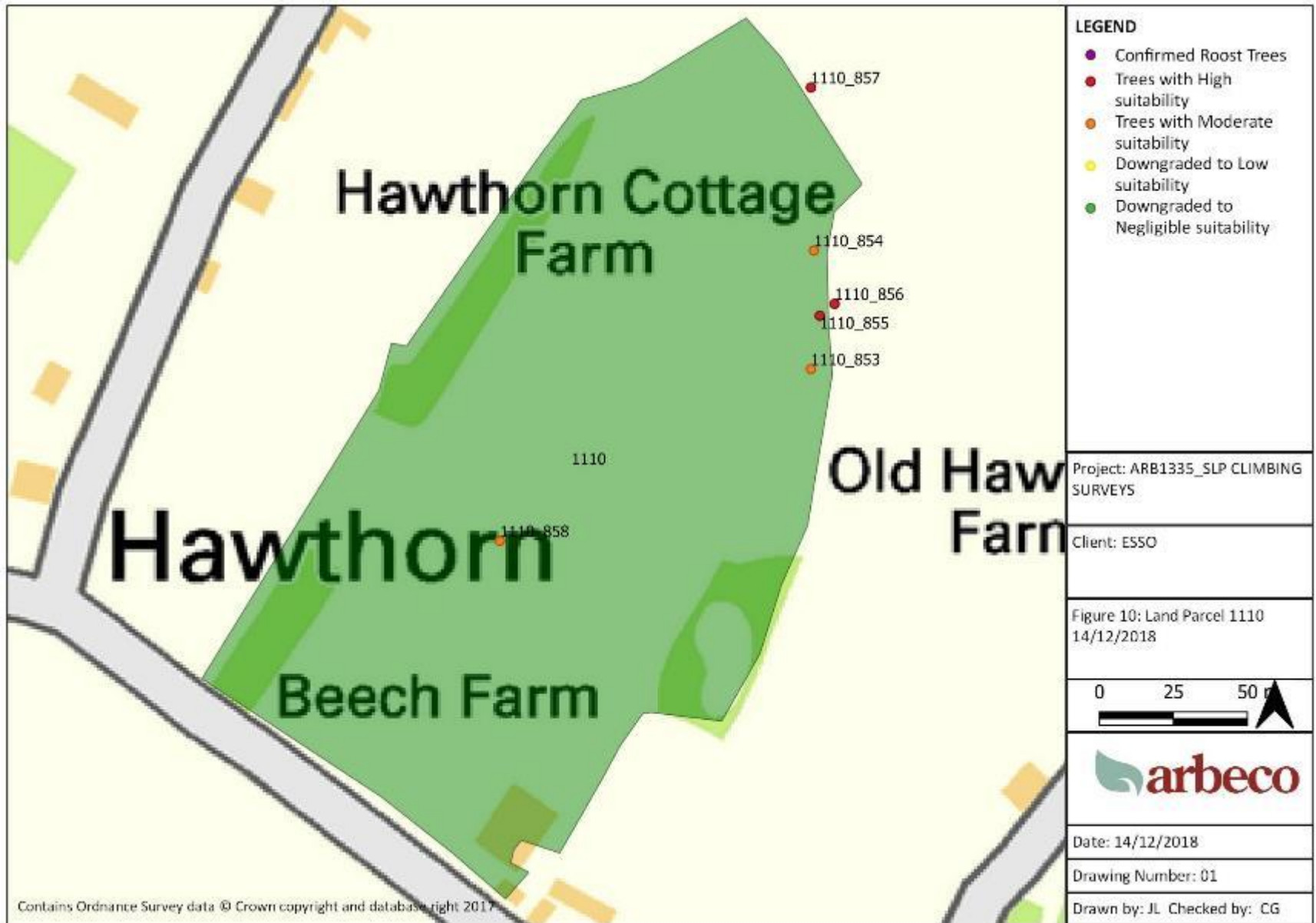
0 75 150 m 



Date: 14/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG





LEGEND

- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 11: Land Parcel 1340
14/12/2018



Date: 14/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG

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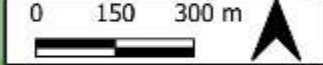
LEGEND

- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 12: Land Parcel 1210
14/12/2018

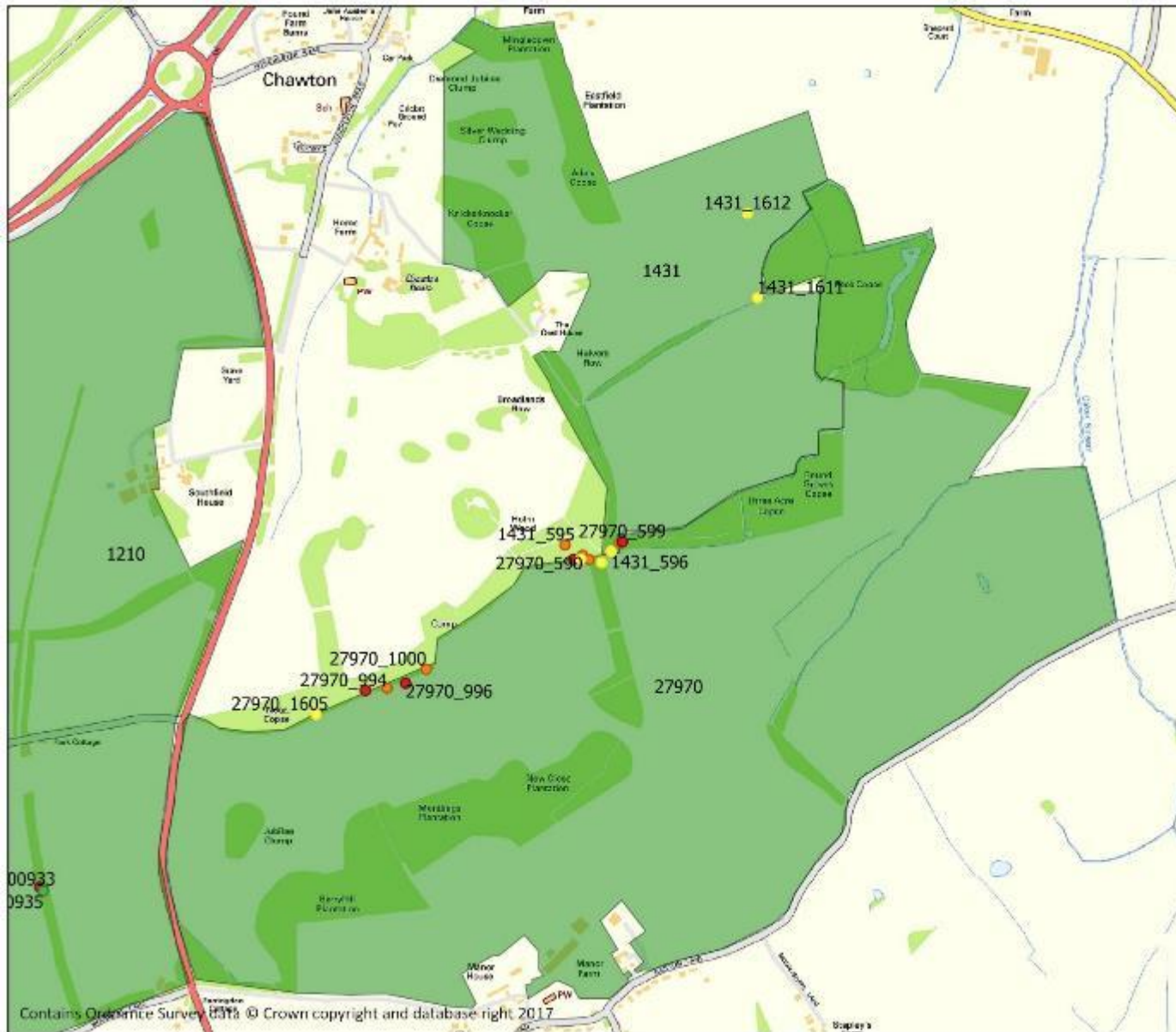


Date: 14/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG

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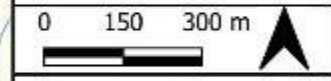
LEGEND

- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 13: Land Parcels 27970 & 1431
14/12/2018



Date: 14/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG





LEGEND

- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 15: Land Parcel 2280
14/12/2018



Date: 14/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG

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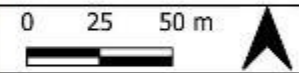
LEGEND

- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 16: Land Parcel 2380
14/12/2018



Date: 14/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG

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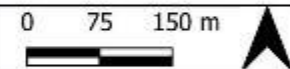
LEGEND

- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 17: Land Parcel 2820
14/12/2018

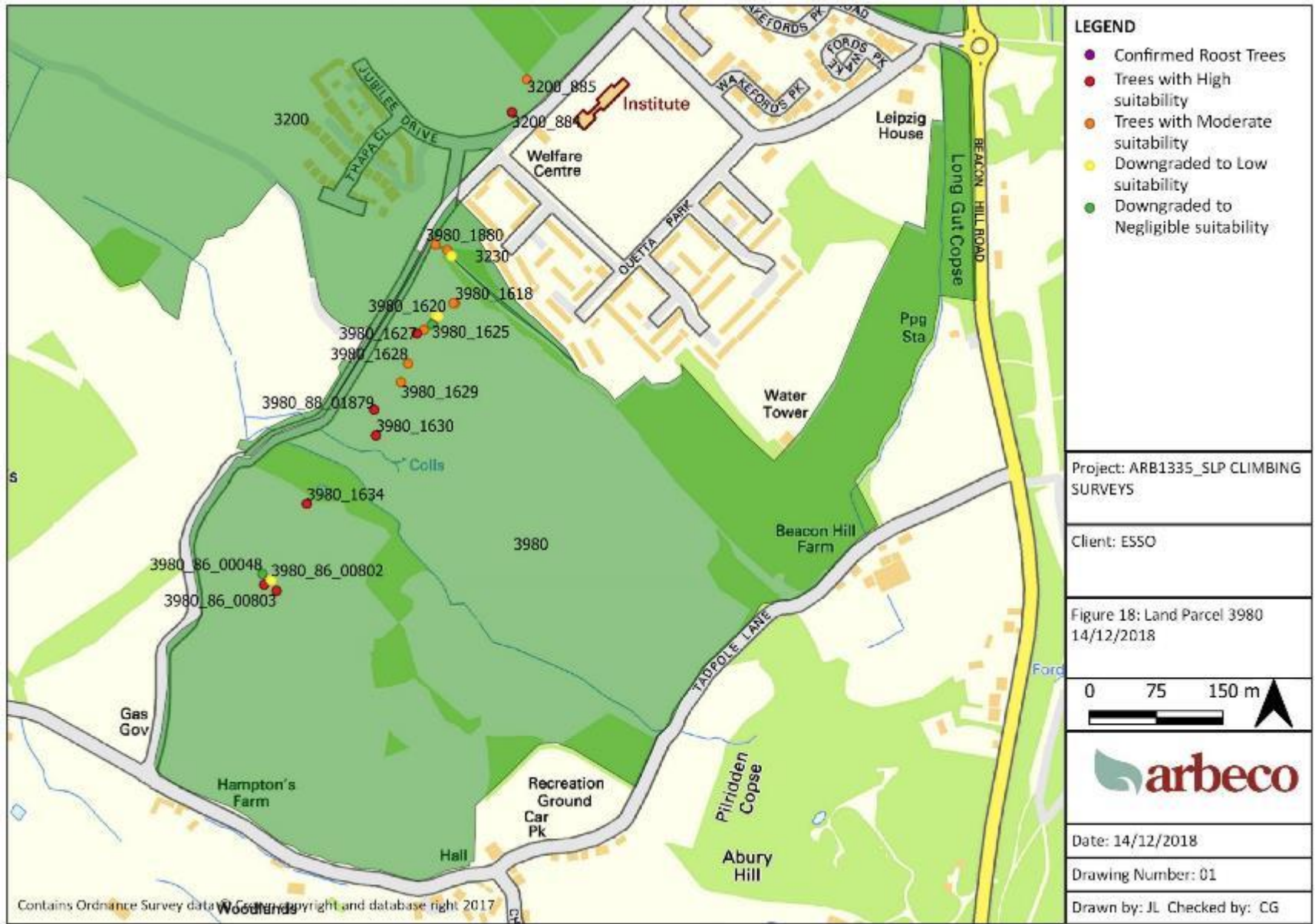


Date: 14/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG

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LEGEND

- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 18: Land Parcel 3980
14/12/2018



Date: 14/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG

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LEGEND

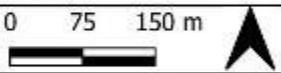
- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability


Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 19: Land Parcels 3230 & 3200
14/12/2018

0 75 150 m





Date: 14/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG

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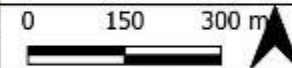
LEGEND

- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 21: Land Parcel 4390
17/12/2018



Date: 17/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG

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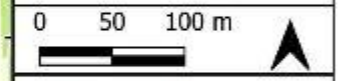


- LEGEND**
- Confirmed roost
 - Trees with high suitability
 - Trees with moderate suitability
 - Downgraded low suitability
 - Downgraded to negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 23: Land parcel 5960



Date: 30/11/2018

Drawing Number: 01

Drawn by: CG Checked by: SM

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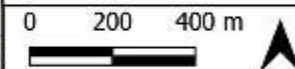
LEGEND

- Confirmed roost
- Trees with high suitability
- Trees with moderate suitability
- Downgraded low suitability
- Downgraded to negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 24: Land parcel 7790



Date: 30/11/2018

Drawing Number: 01

Drawn by: CG Checked by: SM



LEGEND

- Confirmed roost
- Trees with high suitability
- Trees with moderate suitability
- Downgraded low suitability
- Downgraded to negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 25: Land parcel 8000

0 70 140 m

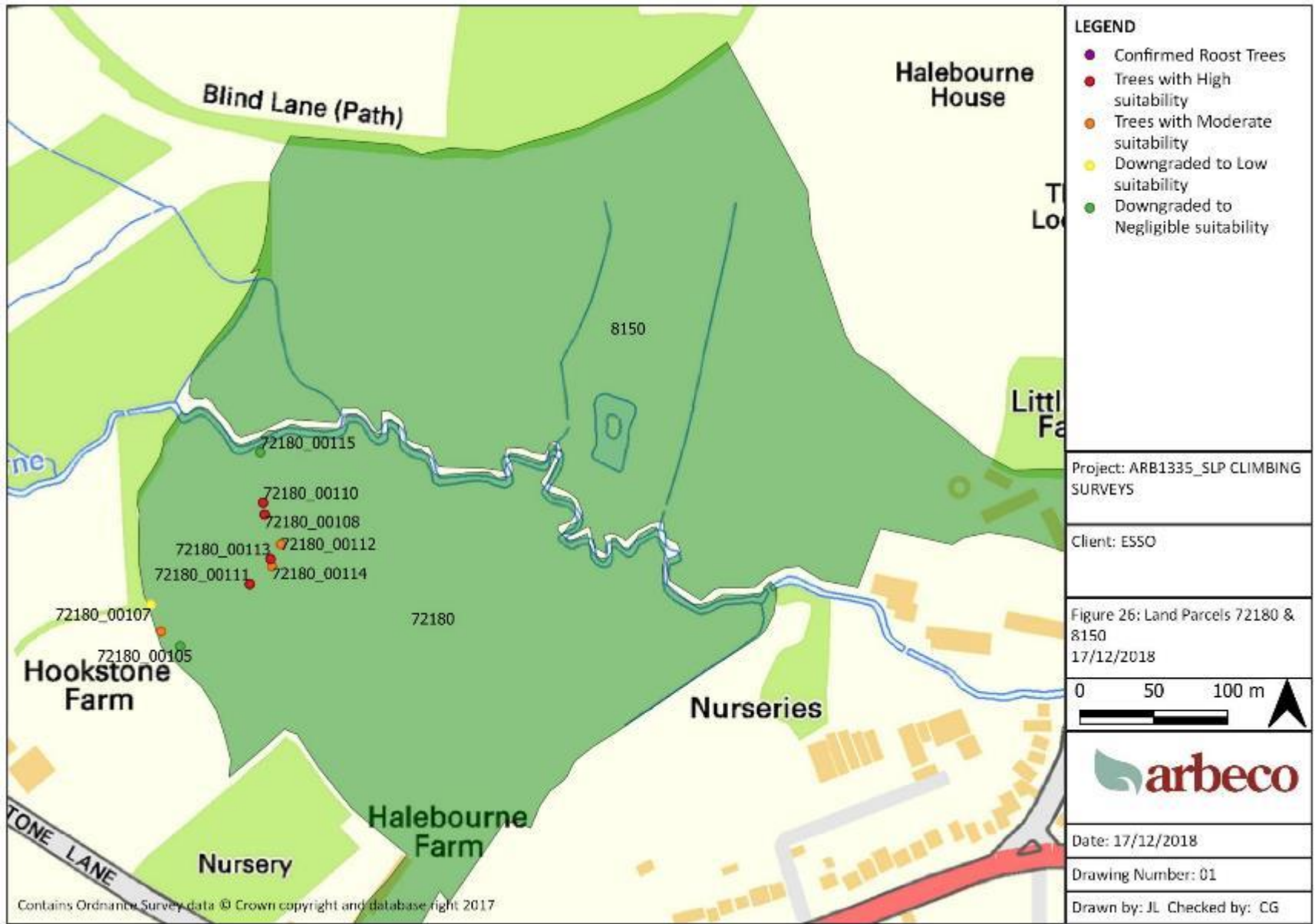
arbeco

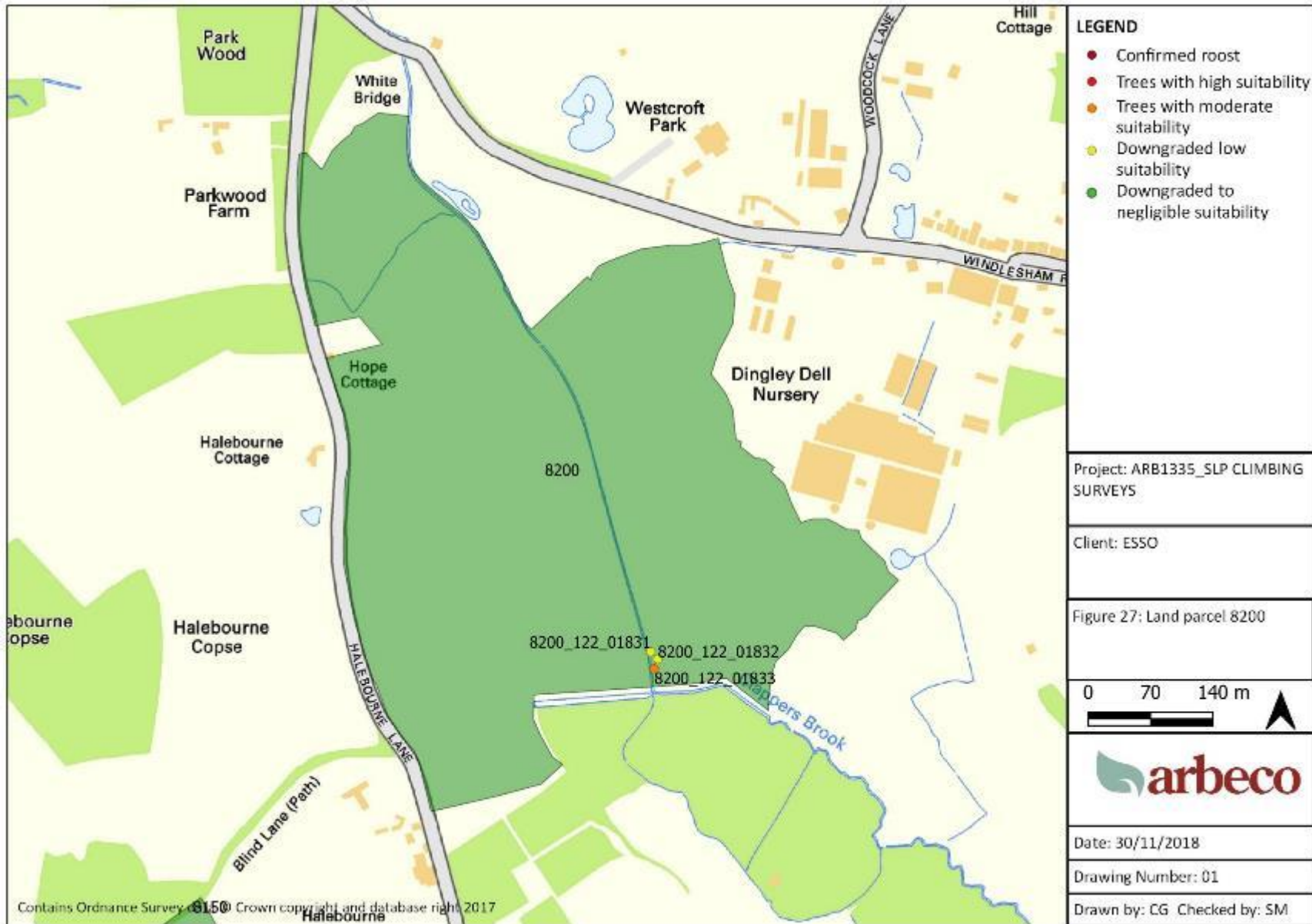
Date: 30/11/2018

Drawing Number: 01

Drawn by: CG Checked by: SM

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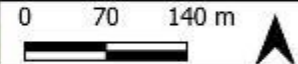
LEGEND

- Confirmed roost
- Trees with high suitability
- Trees with moderate suitability
- Downgraded low suitability
- Downgraded to negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 27: Land parcel 8200



Date: 30/11/2018

Drawing Number: 01

Drawn by: CG Checked by: SM

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LEGEND

- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 28: Land Parcel 8850
17/12/2018

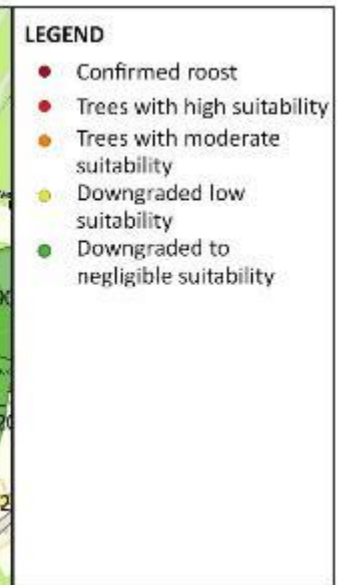
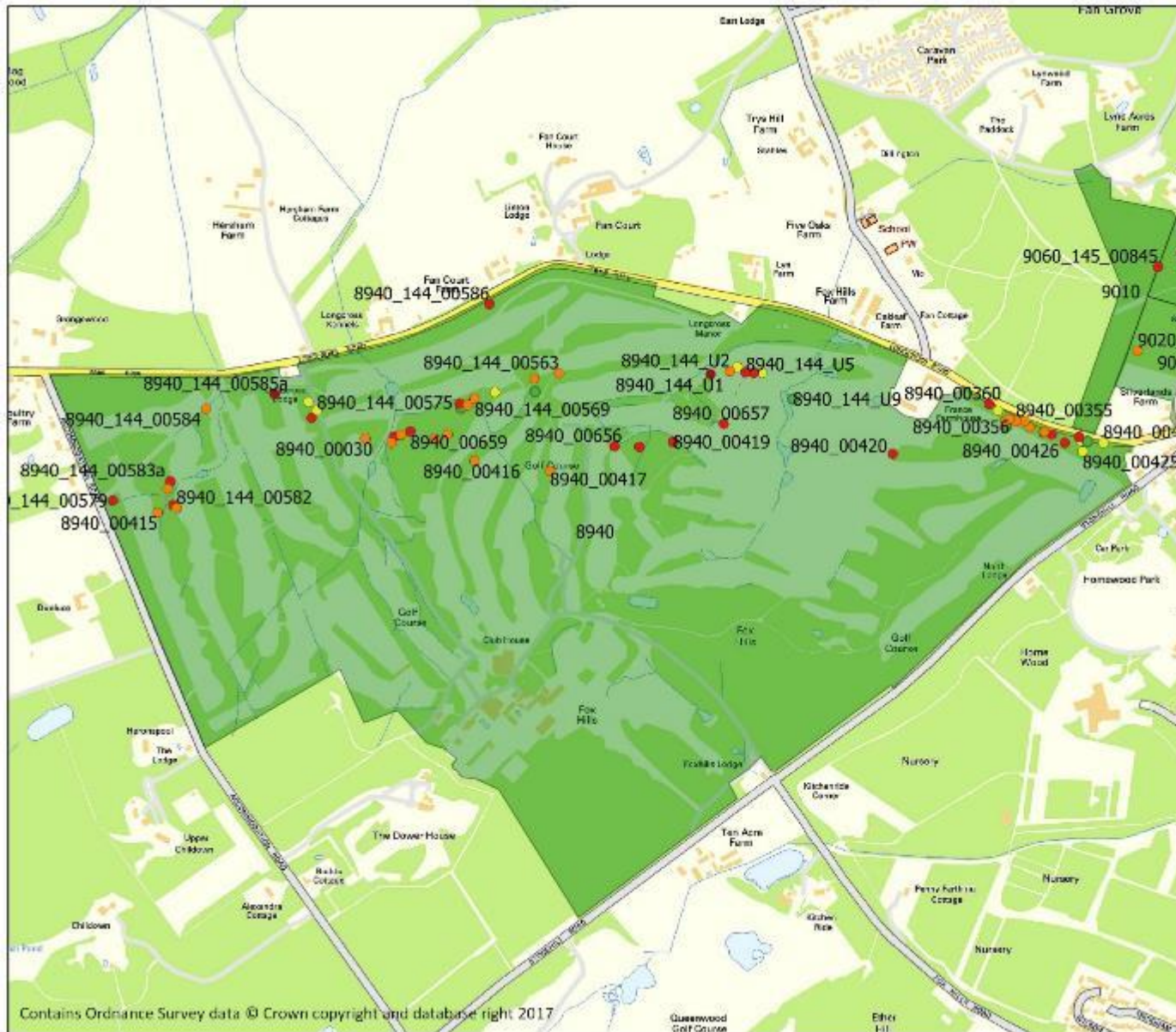


Date: 17/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG

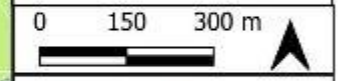
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Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 29: Land parcel 8940



Date: 30/11/2018

Drawing Number: 01

Drawn by: CG Checked by: SM

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LEGEND

- Confirmed Roost Trees
- Trees with High suitability
- Trees with Moderate suitability
- Downgraded to Low suitability
- Downgraded to Negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 30: Land Parcels 9020 & 9060
14/12/2018

0 25 50 m

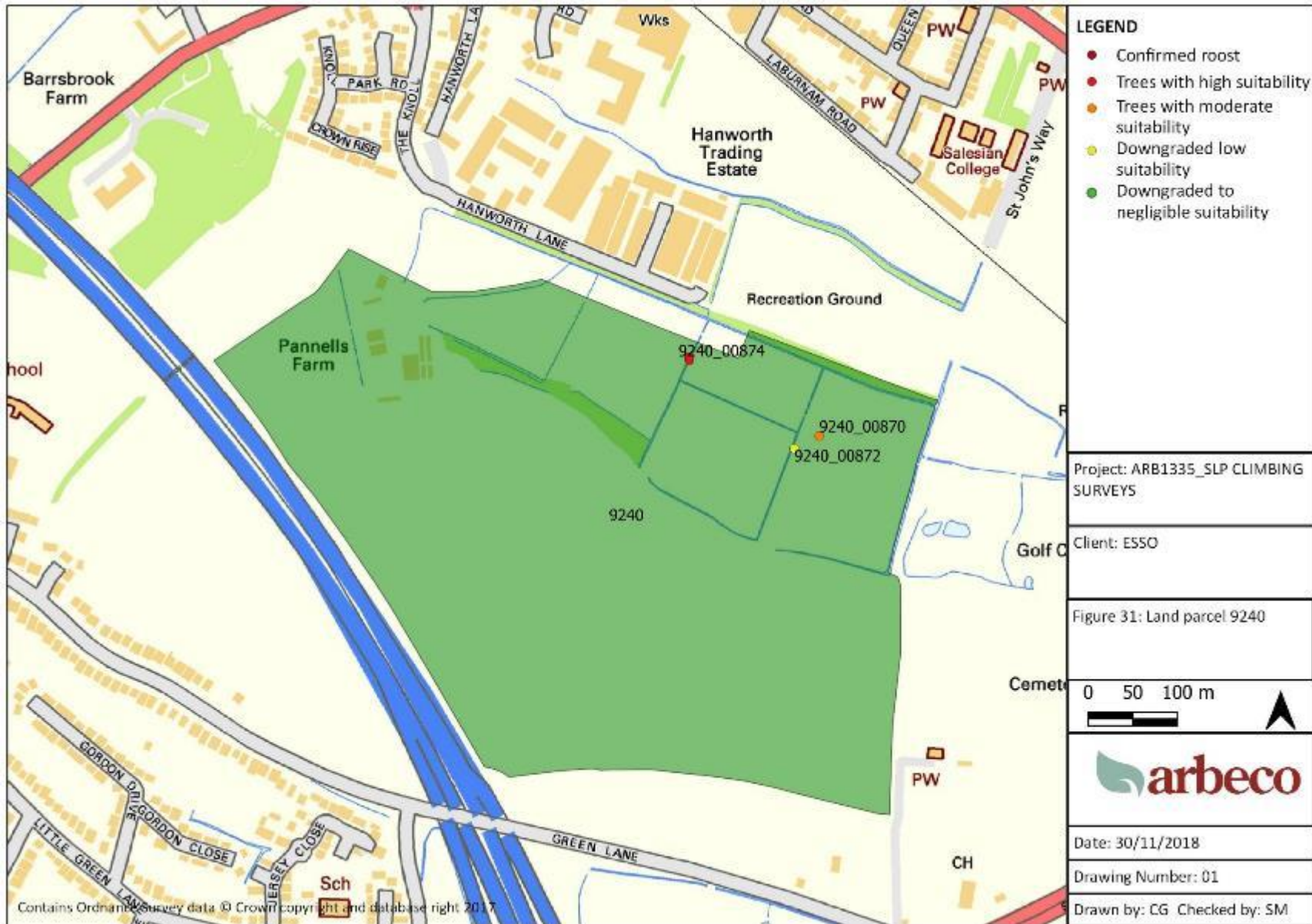


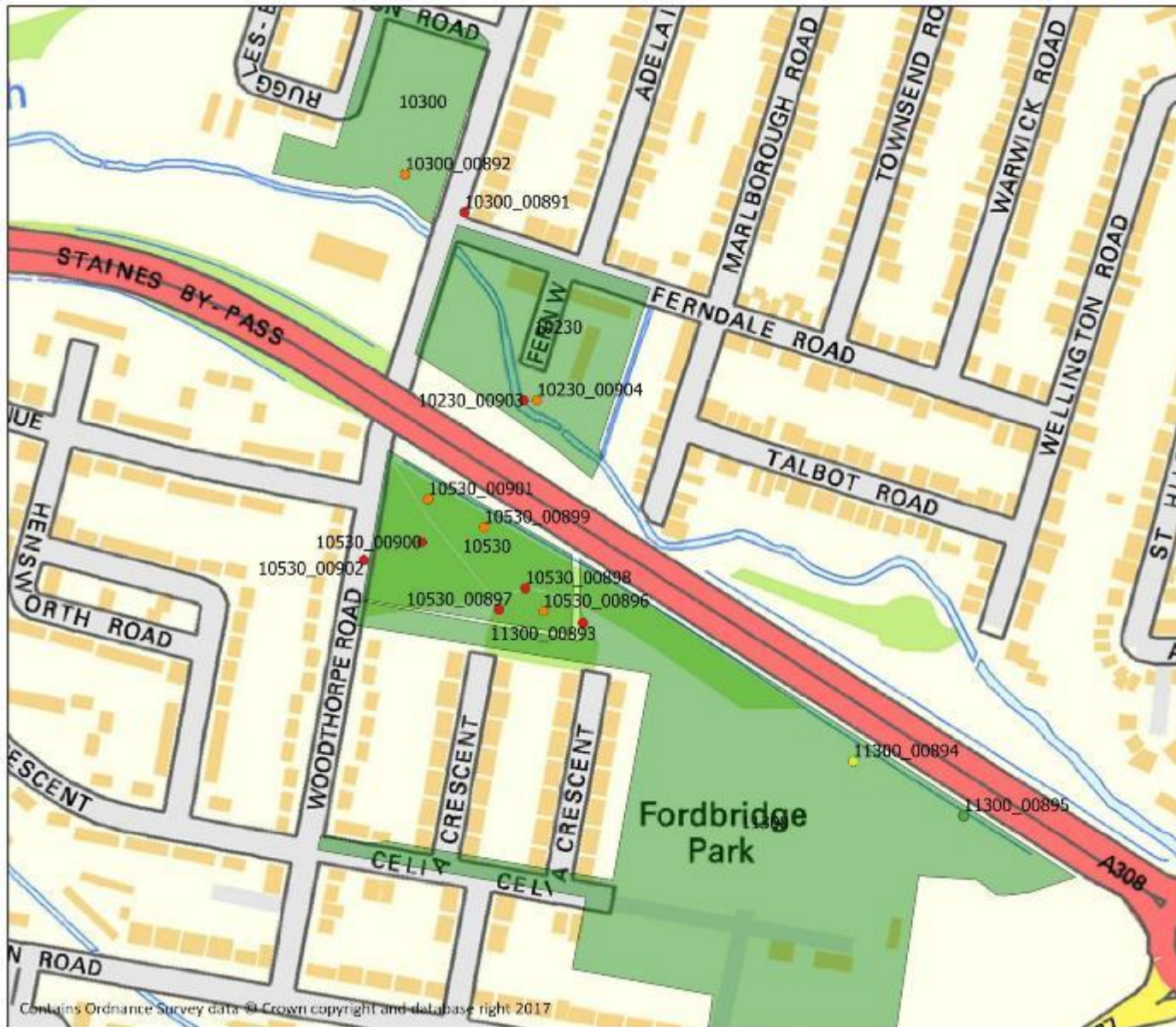

Date: 14/12/2018

Drawing Number: 01

Drawn by: JL Checked by: CG

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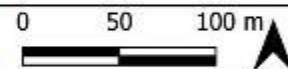
LEGEND

- Confirmed roost
- Trees with high suitability
- Trees with moderate suitability
- Downgraded low suitability
- Downgraded to negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 32: Land parcels 11300 10530 10230 10300

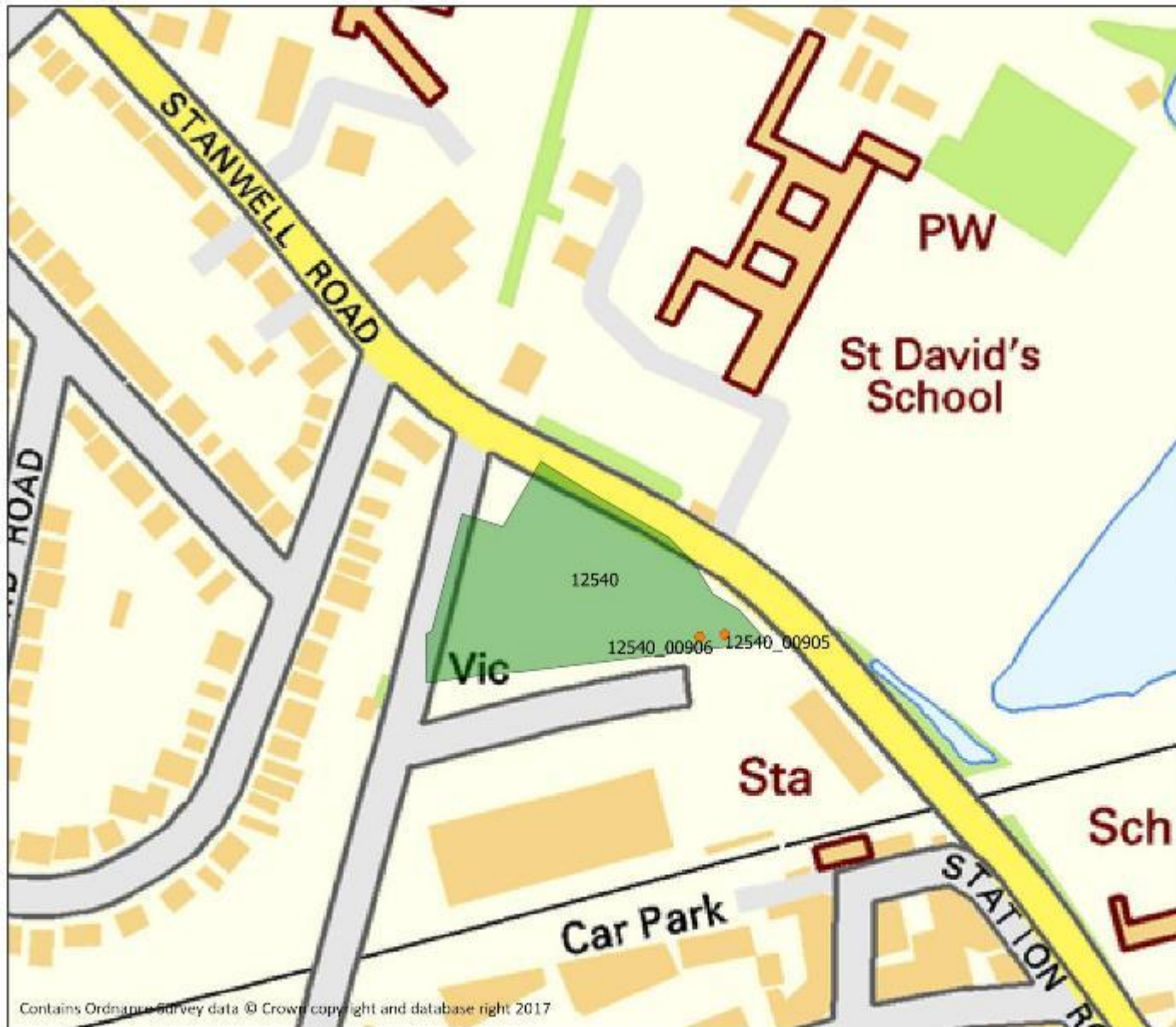


Date: 30/11/2018

Drawing Number: 01

Drawn by: CG Checked by: SM

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LEGEND

- Confirmed roost
- Trees with high suitability
- Trees with moderate suitability
- Downgraded low suitability
- Downgraded to negligible suitability

Project: ARB1335_SLP CLIMBING SURVEYS

Client: ESSO

Figure 33: Land parcel 12540

0 30 60 m

arbeco

Date: 30/11/2018

Drawing Number: 01

Drawn by: CG Checked by: SM

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