Arborweald Environmental Planning Consultancy

Landscape, Arboriculture and Ecology

Surveys – Plans – Assessments - Mitigation – Solutions – Methodology

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Preliminary Roost Assessment and BS:5837 Arboricultural Impact Assessment

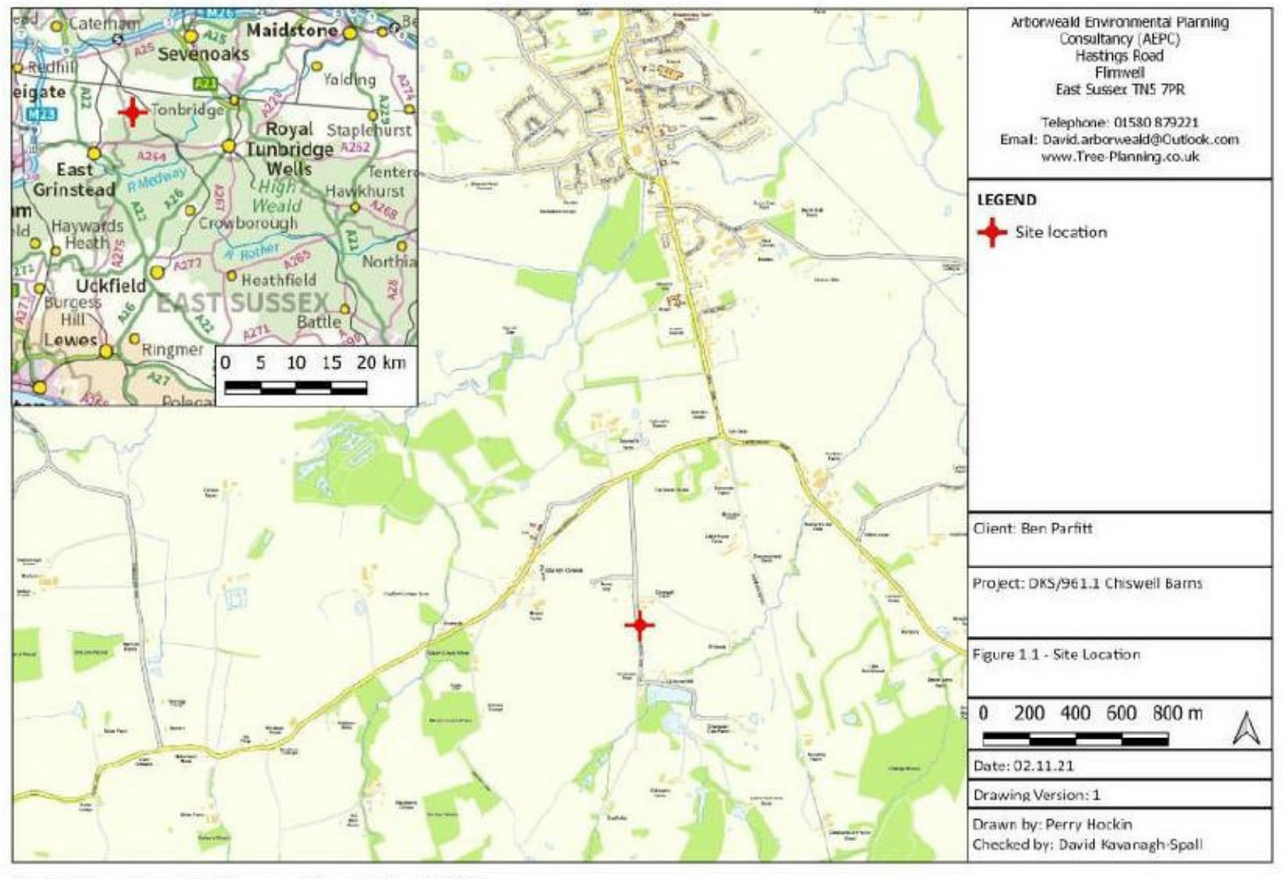
Chiswell Barn

Shernden Lane

Marsh Green

Kent

TN8 5PR



18th November 2021

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Document information

Report title:	DKS961.1 Preliminary Roost Assessment and BS:5837 Arboricultural Impact Assessment survey
Client:	Ben Parfitt
Document ref:	DKS961.1 Preliminary Roost Assessment and BS:5837 Arboricultural Impact Assessment survey
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Report date:	18th November 2021

Declaration: The information which I have prepared and provided for this report is true, and has been prepared and provided in accordance with the CIEEM's Code of Professional Conduct; I confirm that the opinions expressed are my true and professional bona fide opinions.

Printed: Perry Hockin BSc (Hons.), FDSc – Consultant Ecologist, CIEEM

Signed: [redacted]

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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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This report and all survey work have been prepared to British Standard 42020 and British Standard 5837 (2012), and rely on information and methodology from the Joint Nature Conservation Committee and the Chartered Institute of Ecological and Environmental Management.

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EXECUTIVE SUMMARY

0.1 Arborweald Environmental Planning Consultancy (AEPC) were commissioned by Mr Ben Parfitt to undertake a Preliminary Roost Assessment and Arboricultural Impact Assessment at Chiswell Barn, Shernden Lane, Marsh Green, Kent, TN8 5PR (Grid reference for centre of site: TQ 44345 43979) to help inform the proposed application for demolition of the existing detached studio and replacement with a single storey extension to the main house.

0.2 Through a proportionally comprehensive desk study and site visit the habitats within the redline boundary of the site were assessed for their potential to support protected habitats and species. This report evaluates the constraints that the presence of any protected species or species of conservation concern may place on the proposed works to repair the site.

0.3 The habitats present on site have the potential to provide suitable habitat for the following protected species: bats, and birds; this suitability was accordingly assessed and discounted as appropriate.

0.4 The Preliminary Roost Assessment of the studio undertaken by Perry Hockin BSc (Hons) FDSc on the 18th October 2021 recorded no potential bat roost features within the building. This assessment considered the building to have negligible suitability to support roosting bats; in accordance with the Bat Conservation Trust's Bat Surveys for Professional Ecologists Good Practice Guidelines (Collins, 2016), no further surveys were deemed necessary at this stage.

0.5 Subject to the effective application of mitigation strategies no protected species are considered to pose a constraint to the potential works.

0.6 This report provides a Tree Constraints Plan and a draft Tree Protection Plan which will be used to inform the design proposals to minimise potential damage to trees.

0.7 Biodiversity enhancements should be incorporated into the works and section 6 of this report provides detail on potential enhancements. Subject to the effective application of these enhancements, the proposed works have the potential to significantly improve the biodiversity value of the site and the ability of protected species to thrive.

1 INTRODUCTION

1.1 Arborweald Environmental Planning Consultancy (AEPC) were commissioned by Mr Ben Parfitt to undertake a Preliminary Roost Assessment and Arboricultural Impact Assessment at Chiswell Barn, Shernden Lane, Marsh Green, Kent, TN8 5PR (Grid reference for centre of site: TQ 44345 43979) to help inform the proposed application for demolition of the existing detached studio and replacement with a single storey extension to the main house.

1.2 The PRA of the site involved carrying out a detailed assessment to assess the likelihood and potential of the building(s) on site to support bat species. The assessment comprised of a thorough internal and external inspection of all the built structures that would be affected by the proposed development for the presence of bats and/or any evidence of bats or the likelihood that a particular structure could support bat species.

1.3 The Arboricultural Impact Assessment was carried out to the standards outlined in British Standard 5837 'Trees in Relation to Design, Demolition and Construction', and was designed to assess the health, size, and relationships of arboricultural and woody assets on site and their according value so as to determine the most effective methods for protecting trees during development.

1.4 This report refers to the Existing Tree Constraints plan and Tree Protection Plan, attached to this report in PDF format. AutoCAD DWG files for both plans are available upon request.

Legislation and Policy

1.5 Certain habitats and species including nesting birds, bats, dormice, and great crested newts, are afforded protection under the Conservation of Habitats and Species Regulations 2017 and the Wildlife & Countryside Act 1981 (as amended). Further information on the legislation is included in Appendix A.

1.6 In general the above legislation makes it an offence to:

- Deliberately/intentionally or recklessly kill, injure or take a protected species;
- Intentionally or recklessly damage, destroy or obstruct access to any place that a protected species uses for shelter or protection whether the species is present or not;
- Intentionally or recklessly disturb a protected species while it is occupying a structure or place that it uses for shelter or protection;
- Deliberately take or destroy the eggs of species protected by this legislation (such as nesting birds).

1.7 Section 41 of the Natural Environment and Rural Communities Act (2006) lists the species and habitats of principal importance for the conservation of biodiversity in

England and acts as a guide to local authorities in implementing their duties under Section 40, to have regard to the conservation of biodiversity in England.

1.8 Brown trout are not protected under the Wildlife and Countryside Act 1981; however, they are listed as a Priority Species under the UK Post-2010 Biodiversity Framework. In addition, as brown trout are so susceptible to pollution and other conservation concerns their presence / absence can act as an indicator for waterbody health.

[redacted]

1.10 Under The National Planning Policy Framework (NPPF, 2018) protected sites and species are a material consideration in determining planning applications in terms of minimising impacts on biodiversity.

1.11 National Planning Policy guidance uses a mitigation hierarchy, whereby potential impacts are first avoided through changes to design plans; then unavoidable impacts are mitigated against to reduce the negative effect of the impact; finally, residual impacts that remain after avoidance and mitigation measures are applied are compensated for (BS 42020, 2013, Section 5.2). Further to this, it is a requirement under National Planning Policy for developers to actively enhance the biodiversity value of development projects.

Site Description

1.12 The site is located on Shernden Lane to the south of Marsh Green, Kent (Ordnance Survey Grid Reference for the centre of the site: TQ 44345 43979).The development site is approximately 0.03 ha in area and comprises amenity grassland, buildings, scattered trees, introduced shrub, species-poor hedgerow and hardstanding. For the purposes of this report, the habitats on site are not extensively mapped.

1.13 The location of the site is shown in Figure 1.1 with the extent of the site boundary shown in Figure 1.2.

1.14 The habitats in the wider landscape comprise arable, semi improved grassland, semi-natural deciduous woodland, and urban residential. Further to this, the wider landscape contains three Habitats of Principal Importance (HPIs) covered under Section 41 of the Natural Environment and Rural Communities Act, consisting of traditional orchard, lowland meadows, and deciduous woodland including ancient woodland.

The landscape directly surrounding Chiswell Barn is primarily urban residential, with numerous residential dwellings which historically made up Chiswell Farm. The west side of the road opposite Chiswell Barn is still predominantly agricultural comprising arable land separated by hedgerows containing scattered trees. Public access to the site is limited, being situated down a private 'access only' road, and with no public footpaths nearby. As a result, public visibility of the development is likely to be low.

Proposals

1.15 The current proposals comprise demolition of the existing detached studio (in a state of disrepair) and to replace it with an extension of the main house in the same historic style.

1.16 The proposed works will result in the permanent loss of a single building, a shed, an area of hardstanding, introduced shrub, and a single tree. The proposals will also require superficial modification to the main house.

1.17 Figure 6.1 includes recommendations for biodiversity improvements and a planting scheme that if followed would guarantee an increase in ecological value of the site.

Legal Considerations / Risk Assessment

1.18 Although the potential risk to someone passing beneath a tree when the tree or part of it fails is relatively remote, the risk is present. This increases significantly in areas of consistent and regular usage on a year-round basis, such as pedestrian and vehicular highways and amenity areas. Where static structures exist, the risks become constant and an assessment is made as to whether complete or partial failure of a tree could cause damage to such structures.

1.19 Utilities in the proximity of tree roots should be carefully planned to avoid damaging tree structural integrity (installation and maintenance of utilities) and to avoid structural root pressure on utilities.

1.20 Within the scope of any tree survey it is a fact that not all risks of stem or crown failure can be covered, particularly in relation to freak occurrences of weather when even trees of a sound condition can be the subject of structural failure. Trees also have the rare propensity to drop limbs that appear to be in an acceptable condition. These rare occasions have been known to occur in spring and summer on calm days. Although rare, trees shedding limbs should be acknowledged as a risk that cannot be entirely mitigated.

1.21 The law requires that properties are retained safely for residents, visitors and neighbours (Occupiers Liability Act, 1957/84, Defective Premises Act, 1972 and as Common Law Duty of Care) this includes the reasonable care of trees.

2 METHODS

Desk Study

2.1 The Multi Agency Geographic Information for the Countryside (MAGIC) website provided by the Department for Environment, Food and Rural Affairs (Defra) was consulted for information with regard to protected habitats and species within 2 km of the proposed site (red line) boundary.

2.2 Aerial photos of the site (Google, 2020) were examined to determine habitats surrounding the site and hence species likely to be present in order to make appropriate recommendations in the wider landscape context.

Preliminary Roost Assessment

2.3 The methods used in the Preliminary Roost Assessment were based on those recommended in English Nature's Bat Mitigation Guidelines (Mitchell-Jones 2004), the Joint Nature Conservation Committee's Bat Worker's Manual (Mitchell-Jones and McLeish 2004) and the Bat Conservation Trust's Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016).

2.4 The suitability of the bridge to support roosting bats was assessed by examining structural features. Structural features that may influence the suitability of a bridge to support roosting bats include the presence of access points into the bridge structure (including broken bricks, cracks, loose facing materials), the complexity and size of the bridge structure, daytime light ingress, and night time temperatures within the microclimate.

2.5 The suitability of the bridge for roosting bats was also assessed by examining the surrounding habitat. Important habitat features surrounding the structure which may influence roost potential include whether the structure is in a semi-rural or parkland location, the quality of any watercourse present, mature hedgerows, wooded lanes or any areas of woodland.

2.6 Taking account of these architectural and habitat features, the bridge was then assigned a level of roost suitability based on the criteria given in the Bat Conservation Trust's Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016) and professional judgement. The primary objective of this exercise was to identify the need for further detailed bat surveys later in the year, or alternatively to obtain sufficient information that would dismiss the need for further assessment.

2.7 A detailed PRA was undertaken on the 18th October 2021 by qualified ecologist Perry Hockin BSc (Hons) FDSc. An external search around the perimeter of the building was conducted and any possible access points i.e. gaps and crevices were noted and investigated further where possible.

2.8 All surfaces were surveyed for signs of bat presence; as bat presence was ruled out a systematic internal inspection of the building structure for visual indicators of bat presence was conducted using a high powered torch to illuminate areas to check for evidence of bats such as feeding remains or droppings.

2.9 Features of potential value to bats were surveyed not only for the presence of bats but also for signs that could indicate use by bats, such as:

- Bat droppings;
- Staining of access points used by bats to enter the structure; and
- Feeding remains such as moth and butterfly (Lepidoptera) wings.

Arboricultural Survey

2.10 All significant trees within the site boundary and adjacent to site [where access was permitted] were surveyed and individually assessed from ground level in accordance with the British Standard 5837: 2012 Trees in relation to design, demolition and construction. A significant tree is defined as any tree with a diameter at breast height of more than 75 mm or in the case of woodlands or substantial tree groups any tree with a diameter at breast height of more than 150 mm.

2.11 Where trees grow as groups with a relatively uniform age, species mix, structural and physiological condition, these were assessed as a group unless differentiation between the individuals was deemed necessary (e.g. to highlight significant variation in attributes).

2.12 Trees were assessed by way of visual tree assessment (VTA) from ground level with the aid of binoculars, high powered torch, probe, endoscope, acoustic hammer, true metre wheel, laser range finder, compass, drag tape, diameter tape and clinometer

2.13 Each tree and group of trees assessed was allocated to a category (A, B, C or U) based on the age class, condition and useful life expectancy of the tree. Categories A-C have three sub-categories to reflect the arboricultural (1), landscape (2) and cultural/conservation (3) qualities of each tree or group of trees. The table below provides a summary of the categories and of their implications for the development, full details of categorisation criteria are provided in Appendix 1.

Table 2.1 Summary of tree classification and implications for the development

Category	Definition	Implications for the development
A	Trees of high quality with an estimated remaining life expectancy of at least 40 years	These trees are a material consideration in the planning process. Every effort should be made to retain these trees.
B	Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	These trees are a material consideration in the planning process. Every effort should be made to retain these trees.
C	Trees of low quality and value with an estimated remaining life expectancy of at least 10 years or young	These trees are a material consideration in the planning process. Where possible amendments to a proposed design or mitigation measures should be

	trees with a stem diameter below 150mm	considered in preference to tree removal.
U	Trees in poor conditions with an estimated remaining life expectancy of at less than 10 years	These trees are not a material consideration in the planning process and they may need to be removed for reasons of sound arboricultural management.

2.14 Each recorded tree and group was given a reference number which can be found within the Tree Survey Schedule in the Existing Tree Constraints plan maps.

2.15 Branch spread was measured at the four cardinal points: north; east; south; west. Where possible, stem diameters were measured at 1.5m above ground using a measuring tape and current tree heights were measured using a TruPulse 200L Laser Rangefinder.

2.16 As base topographical plans were not available, the approximate position of these trees was estimated and marked to within an accuracy of approximately 1m.

2.17 The root protection area (RPA) of each single stem tree was defined as a circle with a radius 12 times the stem diameter.

2.18 For trees with two to five stems, the RPA was defined as a circle with a radius 12 times the sum of the stem diameters. The combined stem diameter was calculated as follows:

$\sqrt{(\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 + (\text{stem diameter 3})^2 + (\text{stem diameter 4})^2}$ (stem diameter 5)²

For trees with more than five stems the combined stem diameter was calculated as follows:

$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$

2.19 The resulting calculated stem diameter was then multiplied by 12 to give the RPA.

Ash dieback disease

2.20 Following reports of ash dieback disease caused by the fungus *Hymenoscyphus fraxineus* in 2012 there is concern over the future health of ash trees in the UK. Any categorisation of ash trees within this survey is based around the condition at the time of surveying and life expectancy in a normal environment.

2.21 Where ash trees are found to be affected by the disease they will fall into a C or U category (depending on contemporary research findings) and be reported to the Forestry Commission as well as the client.

2.22 More information can be found on the Forestry Commission's web page: http://www.forestry.gov.uk/chalara.

Arboricultural Impact Assessment

2.23 The results of the Arboricultural Survey were used to evaluate the direct and indirect effects of the proposed design on the existing trees and identify appropriate mitigation measures.

2.24 The locations of the recorded trees and of their RPAs were digitised in the Tree Constraints Plan to identify the constraints posed by the existing trees and inform the site layout design.

2.25 The final layout design and the locations and specifications of protective barriers and any other relevant protection measures, including ground protection, which creates a Construction Exclusion Zone (CEZ) were digitised in the draft Tree Protection Plan.

Survey constraints and limitations

2.26 Due to seasonal behaviour of animals and the seasonal growth patterns of plants, ecological surveys may be limited by the time of year in which they are undertaken.

2.27 The information gathered for this ecological survey has facilitated an evaluation of the habitats on site and the likely use of the site by legally protected and notable species. This survey has also given appropriate baseline data for the determination of the requirement for further surveys and/or mitigation and enhancement works.

2.28 Bats are difficult to locate in large structures, with so many potential roosting areas - particularly in inaccessible areas such as large buildings - finding the exact roosting site can be difficult, especially male/single bat roosting sites.

2.29 Bats can have seasonal use of buildings and structures, and being so mobile may arrive and start using a site after it has been surveyed, or roost somewhere else during the period it was surveyed. For this reason, bats may potentially be present but remain undetected, particularly during day time assessment surveys.

2.30 The arboricultural survey was undertaken from ground level and did not involve other specialist arboricultural inspections (e.g. root collar examination or sonic tomography). Where more detailed surveys/inspection of a tree were deemed necessary these have been recommended in the tree survey schedule.

2.31 Although obvious structural defects and the condition of trees were noted, this report does not constitute a full tree risk assessment or management plan.

2.32 Formal assessments of topography, drainage, service conduits and soil conditions including specific laboratory investigations of soil properties (i.e. plasticity index, moisture content, suction pressure) were not undertaken and are beyond the scope of this report.

2.33 Trees are living organisms and their health and condition change with time. Therefore, this assessment remains valid for 12 months from the date of inspection, or until a severe storm is experienced, after which time a new inspection is required. For the purpose of this report, a severe storm is defined as a period of violent weather, involving rain, hail, wind, snow, lightning or any combination of these, likely to cause damage to trees

3 RESULTS

Desk Study

3.1 Records of designated sites and European sites within 2 km of the site boundary were obtained from Multi Agency Geographic Information for the Countryside (MAGIC) website provided by the Department for Environment, Food and Rural Affairs (Defra).

Designated sites

3.2 There are no international/European designated sites within 2km of the proposed site.

3.3 There is one statutory designated site located within 2km of the proposed site, Cowden Pound Pastures SSSI approximately 1,625m to the south east. The site is also located within the High Weald Area of Outstanding Natural Beauty (AONB).

Biological Records

3.4 Following guidance contained within sections 5.5 and 6.2.1 of BS 42020:2013, it was deemed not necessary to obtain biological records from the Kent Biological Records Centre (KBRC) at this stage due to the small scale of the proposed development.

Field Study

Preliminary Roost Assessment

3.5 The site at Chiswell Barn comprises a mid-19th century barn converted to residential use within the last century, with hardstanding and grounds. There is a single storey detached studio building dating to the mid-20th century to the rear of the main house. The buildings are detailed in Table 3.1 below.

Table 3.1: Preliminary Roost Assessment survey results

Building Number/ Reference	Building Description	Suitable Bat Roost Features	Direct evidence of Roosting Bats	Suitability to Support Roosting Bats
Main house	A mid-19th century brick and timber built two storey barn converted to residential use with multiple pitched jerkinhead roof hung with clay tiles. The building is detached, and has a small single storey boiler room addition on the eastern elevation. The main house is accessed from the south west corner, and by a driveway / hardstanding at the northern elevation. The brick walls are exposed on the ground floor and clad with hanging clay tiles on the first floor and gable ends. There is a separate timber shed at the northern elevation on the driveway, which is superficially connected to the main house by sheets of corrugated tin roofing. Overall the building is in good condition with no visible damage externally. For brevity, the main house was not extensively surveyed as the roof structure is not due to be affected by the proposed development.	No suitable features due to be affected by the proposed development; lack of insulation within the boiler room, and lack of soffits means that the building is exposed and draughty. No suitable access features within hanging tiles that are due to be affected on the eastern elevation. The rest of the main house is not due to be affected by the proposed development.	None	**Negligible potential** due to a lack of roosting features, the cold and exposed position of the boiler room, and lack of bat access features within the hanging tiles that are due to be affected.
Studio	A mid-20th century brick and timber built single storey structure built in a historically appropriate style. The building is detached, and comprises an uninsulated and unheated storage room with small enclosed roof void.	A low number of potential roosting features including exposed rafters, with some bat access features such as cracked, broken, or missing roof tiles, and gaps under	None	**Negligible potential** due to the overall cold and exposed position of the building, lack of direct evidence of roosting bats, and internal lining of the roof with bituminous felt

	The roof is constructed as a simple common rafter arrangement with ceiling joists and a bituminous felt lining which is torn and ragged in places. Overall the building is in average condition for its age, however it is showing areas of dilapidation due to a lack of heating, no soffits or fascia boards, and gaps within wall and roofing materials. The building is not frequented, however it does benefit from electric lighting and numerous windows. The loft area is unlit.	rafters.		unsuitable for bat colonisation*

*Some forms of bituminous roofing felt such as woven felt are unsuitable for bat colonisation as bats can trap their claws in the fibres and starve. As a result, only Bitumen 1F felt should be used in buildings with bats, and other types of felt will discourage colonisation by bats.

BS:5837 survey

3.6 A total of two trees and two hedgerows were surveyed during the Arboricultural Impact Assessment at Chiswell Barn.

3.7 The District Council website was consulted to determine whether any tree preservation orders (TPOs) were present within or adjacent to the site. No trees within the site are covered under tree preservation orders.

3.8 Trees were assessed individually and as groups, in relation to the surrounding landscape setting and development proposal. Trees were assessed for general condition, amenity, age and size. Table 3.1 lists the trees and tree measurements and table 3.2 sets out life stage, condition, categorization and estimated remaining contribution. In accordance with BS5837:2012 trees were assessed as individuals and groups based on their amenity contribution and functional proximity. However, trees within groups were subjected to an individual visual tree assessment and tree root protection areas (RPAs) are based upon the largest recorded diameter measurements within the groups unless there are significant differences where, a range of relevant diameter measurements are taken into account. Crown spreads are

measured from group edge trees at cardinal points. Trees surveyed are those within the influence of the proposed development and vice versa. All recommended tree works within table 3.2 when implemented should adhere to British Standard 3998 Tree work recommendations (2010).

Table 3.2 – Trees and tree measurements

Tree no.	Species	Height (m)	DBH (mm)	FB & CS Height (m) AGL	Crown spread @ cardinal points; N,E,S & W (m)	RPA (m^2)
T1	Oleaster pear	5	260	1.6, 1.6	2.5, 2.5, 2.5, 2.5	30.58
T2	Leyland cypress	9	400	2.5, 0.5	3, 4, 2, 4	72.38
H1	Common beech	3	80	AGL, AGL	0.5, 0.5, 0.5, 0.5	70.05
H2	Leyland cypress	9	150	2.5, 2.5	2, 2, 2, 2	29.88

Table 3.3 - Tree condition and amenity contribution

Tree no.	Life stage	SC	PC	EML	BS5837 Category	Comments
T1	MATURE	Average	Average	10+	C1	Tree located to east of main house, south of development area. Tree planned to be removed to facilitate re-landscaping of site, however tree can be protected using standard fencing. Tree has been subject to extensive pruning management in the past, leading to some dead wood / sparseness within crown. No optimal ecological features present. Tree has symmetrical crown, cone shaped; low risk of structural failure subject to continued management. **Tree can be effectively protected through development (TPD) or Tree can be removed to facilitate development (TRFD)**
T2	MATURE	Average poor	Average	10+	C1	Tree located to north east of main house in neighbouring property. Historic biannual pruning and crown lift management (last completed 2017). Historic tear-out at 3m height of lower branch - not healed. No optimal ecological features present. Maintain crown at current dimensions with repeat crown reductions (every 2 years). Tree can be protected throughout development with standard fencing. **Tree can be effectively protected through development (TPD)**
H1	MATURE	Average good	Average good	20+	B2	Hedge located at northern boundary of site within neighbouring property. No damage noted. Periodic inspection advisable, especially where site usage increases due to development. Maintain crown at current dimensions with biannual mechanical cutting. **Tree can be effectively protected through development (TPD)**
H2	MATURE	Average poor	Average	10+	C2	Hedge located at northern boundary of site within neighbouring property. Periodic inspection advisable, especially where site usage increases due to development. Recent DW and minor crown reduction carried out approximately 4 years ago. Maintain crown at current dimensions with repeat crown reductions (every 2 years). Facilitation pruning should be limited to secondary and tertiary thickness branches. Tree can be protected throughout development with standard fencing. **Tree can be effectively protected through development (TPD)**

Structural condition = SC; Physiological condition = PC; Estimated minimum life expectancy = EML; Local Planning Authority = LPA

4 EVALUATION

Habitats

4.1 The habitats present on site are locally common, and comprise locally abundant species typical of the wider landscape.

Protected sites

4.2 There is one statutory designated site located within 2km of the proposed site, Cowden Pound Pastures SSSI approximately 1,625m to the south east. The site is also located within the High Weald Area of Outstanding Natural Beauty (AONB).

Species

This section discusses three separate issues;

- Potential species constraints whereby a protected species has the potential to pose a constraint on a development therefore requiring a phase 2 species specific survey to further analyse such a threat, and whether added mitigation is required to reduce the risk of an offence being committed.
- Habitat suitability to support protected species, i.e. whether prudent habitat management can be targeted towards a species to improve the biodiversity value of the site.
- Arboricultural constraints within the site boundary and surrounding landscape that will be affected by the proposed development.

Preliminary Roost Assessment

Bats

4.3 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).

4.4 The Preliminary Roost Assessment considered the studio to have negligible potential to support bats due to a lack of suitable roosting features and exposure to the elements. Additionally, the area of the main house that will be affected by the proposed development was considered to be of negligible suitability to support roosting bats due to a lack of suitable roosting features.

4.5 As a result, bats are not considered to pose a constraint to this part of the proposed work and no further surveys are required.

4.6 None of the trees on site were considered suitable to support roosting bats due to their age and subsequent lack of features.

4.7 The rest of the habitats on site provide foraging and commuting opportunities for bats.

4.8 As the site has potential to support bats they are considered further in Section 6 of this report.

Trees

Arboricultural Impact Assessment

4.9 The proposed development would [if consented] have a minimal arboricultural impact to the immediate area; proposed removal of trees to facilitate development is confined to the south eastern edge of the site where visibility from public places and the wider landscape is extremely limited.

Proposed Tree Removal

4.10 The proposed tree removals comprise removal of T1 oleaster pear to the south east of the studio; as the tree is a category C feature which can be easily replaced, its loss to facilitate development is acceptable. The arboricultural impact of the removal of T1 were also assessed particularly from a public perspective with views into the site taken into consideration; views and site lines from the wider landscape in particular Shernden Lane are extremely limited due to the position of the main house and driveway.

Mitigation Planting

4.11 Appropriate mitigation planting for the proposed removal of T1 must follow existing native species found within the surrounding area. Care must be taken to ensure that planting locations ensure a future sustainable relationship between the proposed development and mature height, root and crown spread of new planting. Careful selection of appropriate species and planting locations will help to enhance the centre of the existing amenity grassland.

4.12 Improved structural diversity for this area can be achieved by planting both standard and understorey trees/shrubs. Biodiversity for this area can be improved by increasing native species diversity with careful selection of species with good local provenance; details on positions of planting and species to consider are discussed in Section 6.

Facilitation Pruning

4.13 All other recommended tree works are limited to minor facilitation pruning of lateral growth to the southern crown spreads of H2 and T2 for access and the removal of any significant deadwood over the proposed development area. All facilitation pruning should be carried out before any building works take place to avoid damage from construction and as specified within table 3.3 should be limited to smaller diameter tertiary and secondary branches; all tree work must be carried out under British Standard 3998 Tree Work recommendations.

Rhizosphere Restrictions

4.14 The area proposed for development is currently a concreted surface at the same level as the main house with the concrete surface continuing around to the east and south east of the property. Factoring this in, existing roots within the proposed area for development is extremely unlikely, and therefore construction would not detrimentally impact root morphology of adjacent trees.

Site Access from Shernden Lane

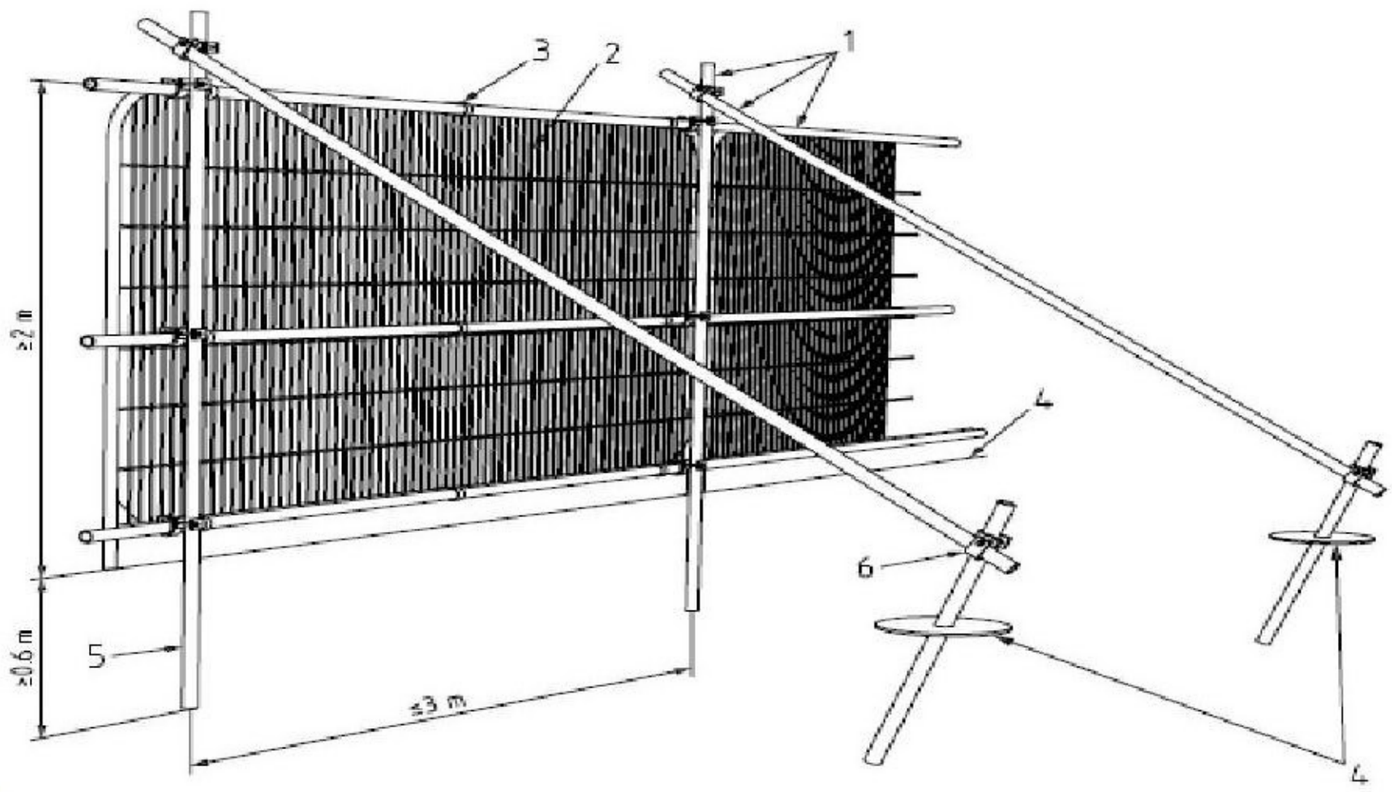
4.15 It is recommended that all construction vehicles accessing the proposed development are limited in height to 5m due to the overhang of some lateral branches along Shernden lane; Shernden Lane for the most part is a single track narrow road and as such it is advisable that construction vehicles are of limited size anyway. Access to Chiswell Barn is on to a level driveway from Shernden Lane, where again vehicle size should be limited in order to access the property.

4.16 T2 is located to the north of the driveway, with some secondary laterals overhanging the driveway; minor facilitation pruning of secondary branches on the western and southern sides of T2 is recommended in order to limit the risk of vehicles striking branches.

Arboricultural protection

4.17 In accordance with BS5837 (2012) effective tree protection would be achieved through the provision of construction exclusion zones (CEZs) protected by the erection of appropriate barriers (fig 2.) and limiting construction activities to specified construction operations areas (COAs). The CEZ's are sacrosanct areas that usually should not be the subject of any disturbance, including the stacking of materials. The site foreman or arboriculturist should ensure that the barriers are not breached and that the CEZs remain sacrosanct tree protection areas.

4.18 All retained trees, groups and hedges would be the subject of protection through the erection of appropriately signed barriers 'Construction Exclusion Zone – Keep Clear' and through compliance with construction methodology (Section 6.). Utility services should be laid outside of the CEZs where possible. Locations for COAs, CEZs and protective fencing are contained within the Tree Protection Plan attached to this report.



Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Fig 4.1: BS5837 Recommended Barrier Specification

Construction Operations Area (COA)

4.19 The COA is an area or areas where all demolition and construction activities are carried out, including logistics / material storage, construction worker facilities, mixing of construction materials and fuels etc. without detrimentally impacting on retained trees on and adjacent to the site. It should be the responsibility of the site foreman to plan COAs for each phase of development, taking trees into account, and to ensure that all development associated activities remain within COAs and building footprints.

5 CONCLUSION

5.1 The site is currently considered to have low ecological value within a local context as it comprises locally common habitats supporting locally abundant species typical of the wider landscape.

5.2 The biodiversity value of the total site area is largely attributed to the following factors:

- The lack of suitable bat roosting habitat on site;
- The average quality of arboricultural assets on site and within the wider landscape; and
- The abundance of higher quality habitat in the wider landscape.

5.3 The work proposals comprise demolition of the existing detached studio (in a state of disrepair) and to replace it with an extension of the main house in the same historic style.

5.4 Subject to the effective application of mitigation as outlined in Section 6, at this stage no species are considered to pose a constraint to the proposed works.

5.5 Recommendations are outlined in Section 6 of this report. These should be followed to ensure that any potential impacts to protected species and arboricultural assets are adequately addressed during the planning stage, working and post-working stage, and to ensure biodiversity enhancement and maintenance of long-term ecological and arboricultural quality of the site, and wider landscape within direct influence of the site.

6 RECOMMENDATIONS

6.1 Due to the presence of habitats on site that have the potential to support protected species recommendations to further consider these species in line with the legislation protecting them are given below.

6.2 The proposed work is small scale in an ecological context; however, the quality of the habitats that will be affected and their potential to support protected and notable species is such that mitigation will be required to ensure that protected species are not detrimentally affected.

6.3 These recommendations are therefore designed to work on a worst-case scenario basis, and to offer biodiversity enhancements to benefit the local area by attracting species in. Management recommendations are detailed in Figure 6.1.

Biodiversity net gain

6.4 Under the National Planning Policy Guidance document, it is a requirement for the planning system to minimise impacts on and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity. In order to conserve and enhance the natural environment the following provisions should be included:

Species specific

6.5 ***Bats***:

All of the habitats on site have the potential to support foraging and commuting bats.

None of the trees on site were considered to have potential to support roosting bats due to their age and lack of suitable features such as cavities, holes, or lifted bark.

Lighting

6.6 While different species of bat react differently to night time lighting, research has found that bats overall are sensitive to artificial lighting. Excessive and/or poorly directed lighting may delay bats in emerging from their roosts; shortening the time available for foraging, as well as causing bats to move away from suitable foraging grounds, movement corridors or roosting sites, to alternative dark areas (Jones, 2000).

6.7 To minimise indirect impacts from lighting associated with the proposed development, it is recommended that artificial lighting is only directed where necessary for health and safety reasons. Lighting should not illuminate any trees, hedgerows or mitigation and compensation features, such as hanging tiles and integrated bat boxes, or suspected or confirmed bat roosting sites. Lighting should only be used for the period of time for which it is required (Jones, 2000). This can be achieved by following accepted best practice (Fure, 2006; Institute of Lighting Engineers 2009; Bat Conservation Trust 2011):

- The level of artificial lighting including flood lighting should be kept to an absolute minimum;
- Where this does not conflict with health and safety and/or security requirements, the site should be kept dark during peak bat activity periods (0 to 1.5 hours after sunset and 1.5 hours before sunrise);
- Lighting required for security or safety reasons should use a lamp of no greater than 2000 lumens (150 Watts) and should comprise sensor-activated lamps;
- Lights utilising LED technology are the preferred option as these lights do not emit on the UV spectrum, are easily controllable in terms of direction/spill and can be turned on and off instantly;
- Avoid the use of sodium or metal halide lamps, these gas lamps require a lengthy period in which to turn off and the diffuse nature of the light emitted makes light spillage a significant problem.
- Lights required for night time deliveries or security patrols could be set to activate with pressure activated sensors set into the ground;
- Lighting should be directed to where it is needed to minimise light spillage. This can be achieved by limiting the height of the lighting columns and by using as steep a downward angle as possible and/or a shield/hood/cowl/ that directs the light below the horizontal plane and restricts the lit area;
- Artificial lighting should not directly illuminate any confirmed or suitable bat roosting features or habitats of value to commuting/foraging bats. Similarly, any newly planted linear features or compensatory bat roosting features should not be directly lit; and
- Lighting design computer programs can be used to predict the potential impacts of light spillage.

Foraging habitat

6.8 The development should include new hedge planting along linear boundaries using a native species-rich hedgerow mix to include a minimum of 7 species from the following list: hazel, hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, spindle *Euonymus europaea*, wayfaring tree *Viburnum lantana*, crab apple *Malus sylvestris*, hornbeam *Carpinus betulus*, dog rose *Rosa canina*, field maple *Acer campestre* and wych elm *Ulmus glabra*. The client has told the author that they are in discussions with their neighbour regarding replacing H2 with a new hedgerow, in which case this would be an ideal location for a species rich mixture.

6.9 Scattered mature standards comprising hornbeam *Carpinus betulus*, field maple, or lime *Tilia cordata* var. 'Green Spire' should be planted across the site to increase woody coverage and connectivity. These species are hardy, low maintenance and also do not risk dominating the landscape in later life as they can be coppiced or pollarded effectively. These species would make good replacements as standard trees to compensate for the removal of T1.

6.10 None of the trees on site were considered to have potential to support roosting bats due to their age and lack of suitable features such as cavities, holes, or lifted bark. Bat boxes should be placed and on the eastern side of the main house.

6.11 An increase in invertebrate habitat should be a key part of the plan, to include wildflower planting for bees and other pollinators within the curtilage to the east to help increase the number of foraging opportunities available for bats.

6.12 In addition, mixed height sward management of the garden area will support a wider range of insect species than the current amenity grassland. As well as bats, this mosaic habitat will help to support foraging mammals s[redacted]and ground nesting birds.

6.13 Fruit trees should be planted including apple *Malus sp.*, pear *Pyrus sp.,* and *Sorbus spp.* to ensure an appropriate level of cover for bats and to provide a micro-climate between trees to support insect species. The fruit trees will also improve linear connectivity with areas of higher quality habitat in the wider landscape. Fruit trees also work well within linear boundaries such as hedgerows.

Bat loft

6.14 The client should seriously consider construction of a dedicated bat roof void within the extension as an enhancement measure. A bat loft would be accessed by special bat access tiles; inclusion of a bat loft in one of the buildings would negate the need for bat boxes on that building.

6.15 The loft should be built with exposed interior joists to provide suitable roosting and hibernation opportunities for bats during winter. This space should be accessed by integrated bat access tiles on the eastern / northern elevations to reduce wind cooling of the space. Placing the roof void in the new extension will reduce the risk of bats being disturbed as it is less likely to be redeveloped in the near future.

6.16 The bat loft should be insulated so as to maintain a constant temperature throughout the year, and should be unlit and shielded from artificial lights where possible.

6.17 ***Breeding birds***:

The scattered trees and hedgerows on site and within the wider landscape have the potential to support breeding birds.

All facilitation tree and hedge cutting works should be confined to outside of the bird breeding season (February – October inclusive) and should be undertaken under ecological supervision where works are undertaken within nesting season. If an active nest is found it should be left protected by a 5m buffer of habitat until the chicks have fledged (approximately 1 month).

No further surveys for breeding birds are deemed necessary at this stage.

Trees:

6.18 As T1 is being removed to facilitate development, and the other trees that are due to be affected by the proposed development are not within ownership of the client, soil amelioration and compaction reduction will not be possible as part of the development. The planting area specified within the development plan to the north of the new extension will be constructed in an area previously covered by hardstanding, therefore it should be subject to soil aeration to relieve compaction, in order to promote future health of planted trees. Soil amelioration and aeration methodology is detailed within Appendix C of this report.

Additional recommendations

6.19 Construction waste, building materials and machinery should be stored on existing areas of hardstanding at the rear of the main house during the construction process. Construction waste should be stored in skips, with all new building materials kept on pallets until immediate use to avoid the possibility of protected species utilising piles as habitat.

6.20 **Biodiversity enhancement and compensation**

It is the author's professional opinion that due to the small scale of the proposed works, a dedicated area for wildlife compensation and enhancement measures is not necessary as the improvements listed above can be incorporated into the site boundary without the need to sacrifice amenity value.

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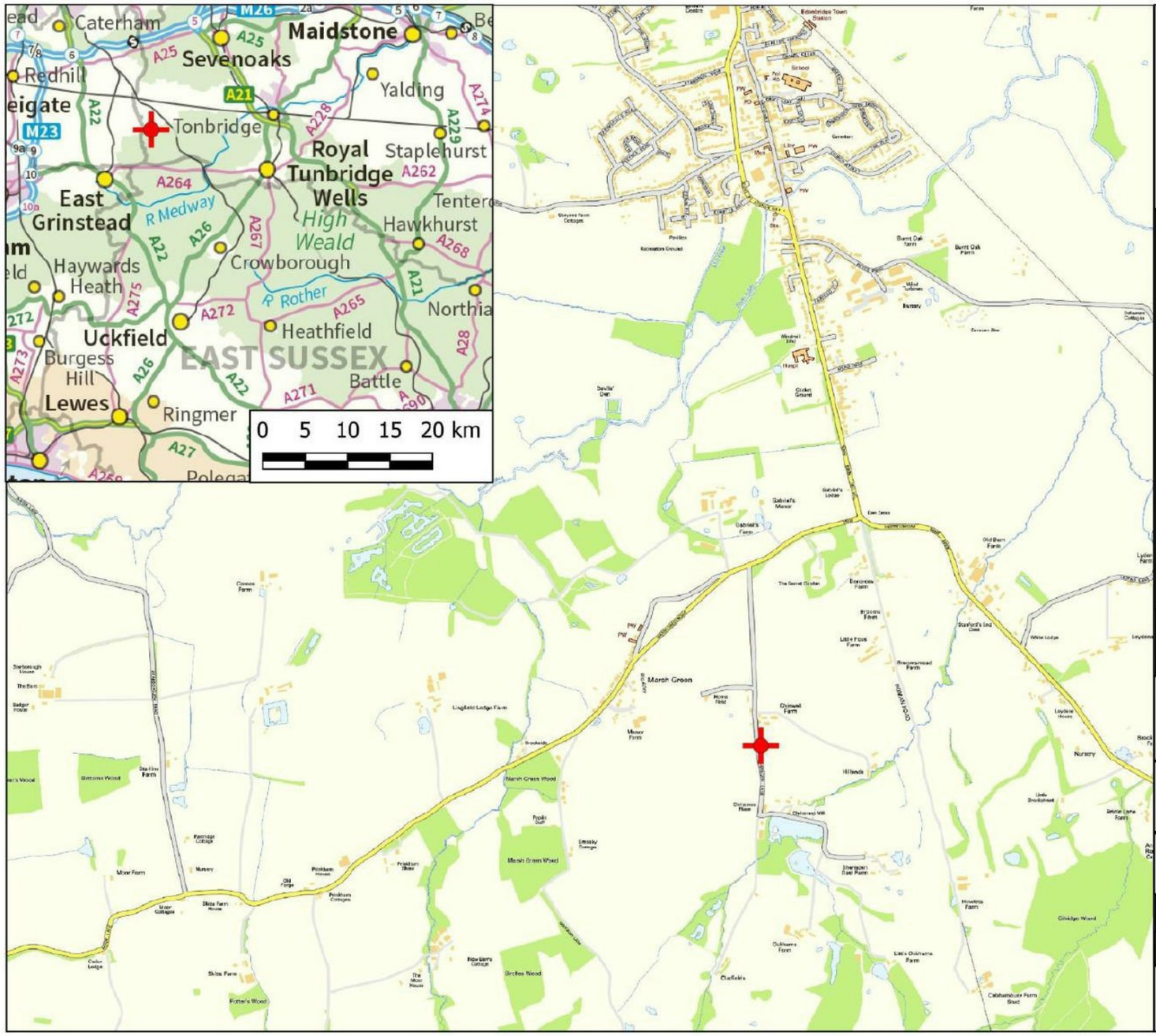
FIGURES

Attached to this report are the Existing Tree Constraints (ETC) plan, and the Tree Protection Plan (TPP).

*All recommendations for biodiversity enhancements are figurative, exact measurements and numbers are not specified. Building positions and plans are indicative; for accurate building plans please refer to the attached ETC and TPP.



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LEGEND

Site location

Client: Ben Parfitt

Project: DKS/961.1 Chiswell Barn

Figure 1.1 - Site Location

0 200 400 600 800 m

Date: 02.11.21

Drawing Version: 1

Drawn by: Perry Hockin
Checked by: David Kavanagh-Spall

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LEGEND

Site boundary

Client: Ben Parfitt

Project: DKS/961.1 Chiswell Barn

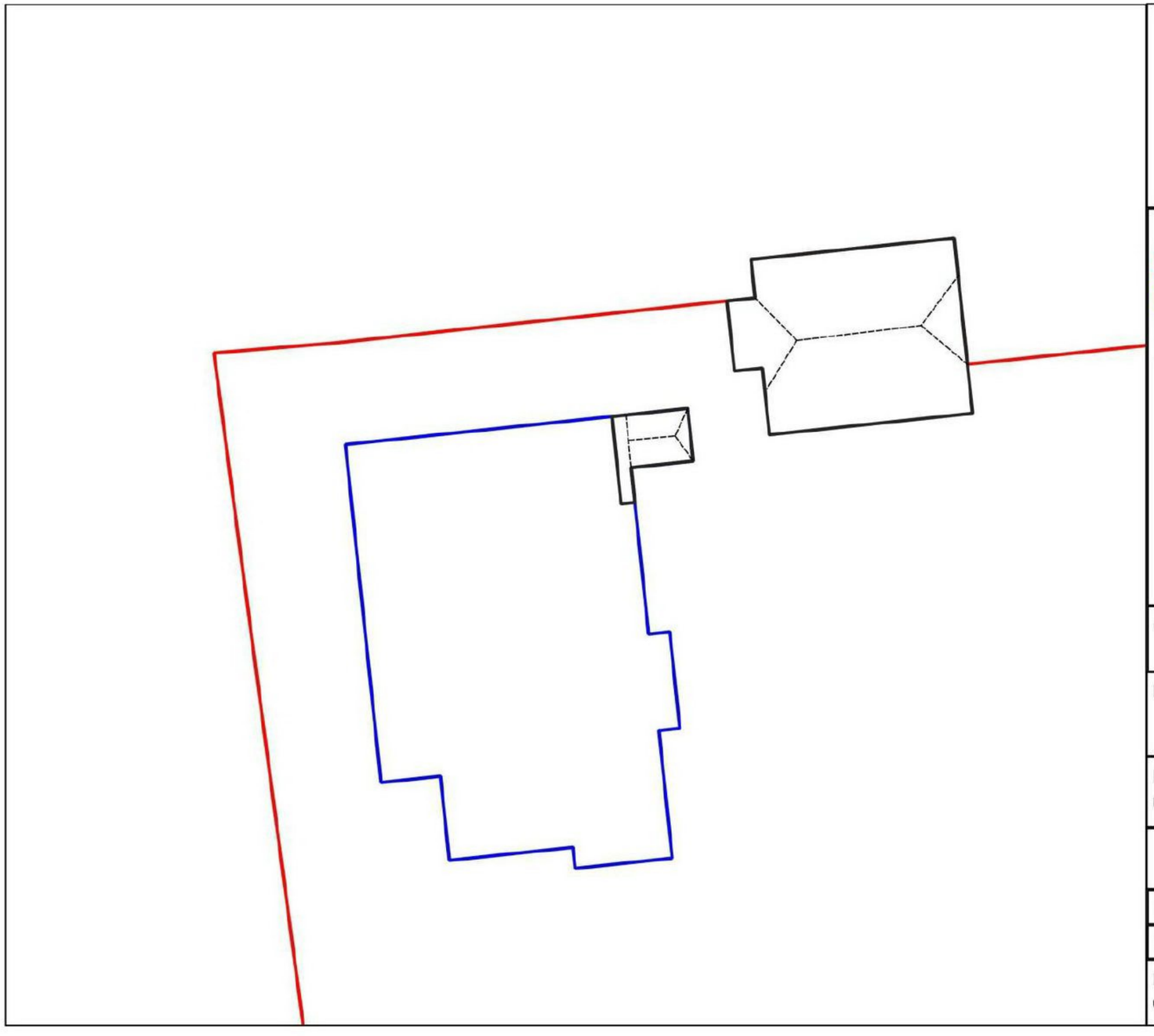
Figure 1.2 - Site boundary

0 10 20 30 40 m

Date: 02.11.21

Drawing Version: 1

Drawn by: Perry Hockin
Checked by: David Kavanagh-Spall



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LEGEND

- Site boundary
- Building not surveyed
- Building surveyed
- ----- Roof line

Client: Ben Parfitt

Project: DKS/961.1 Chiswell Barn

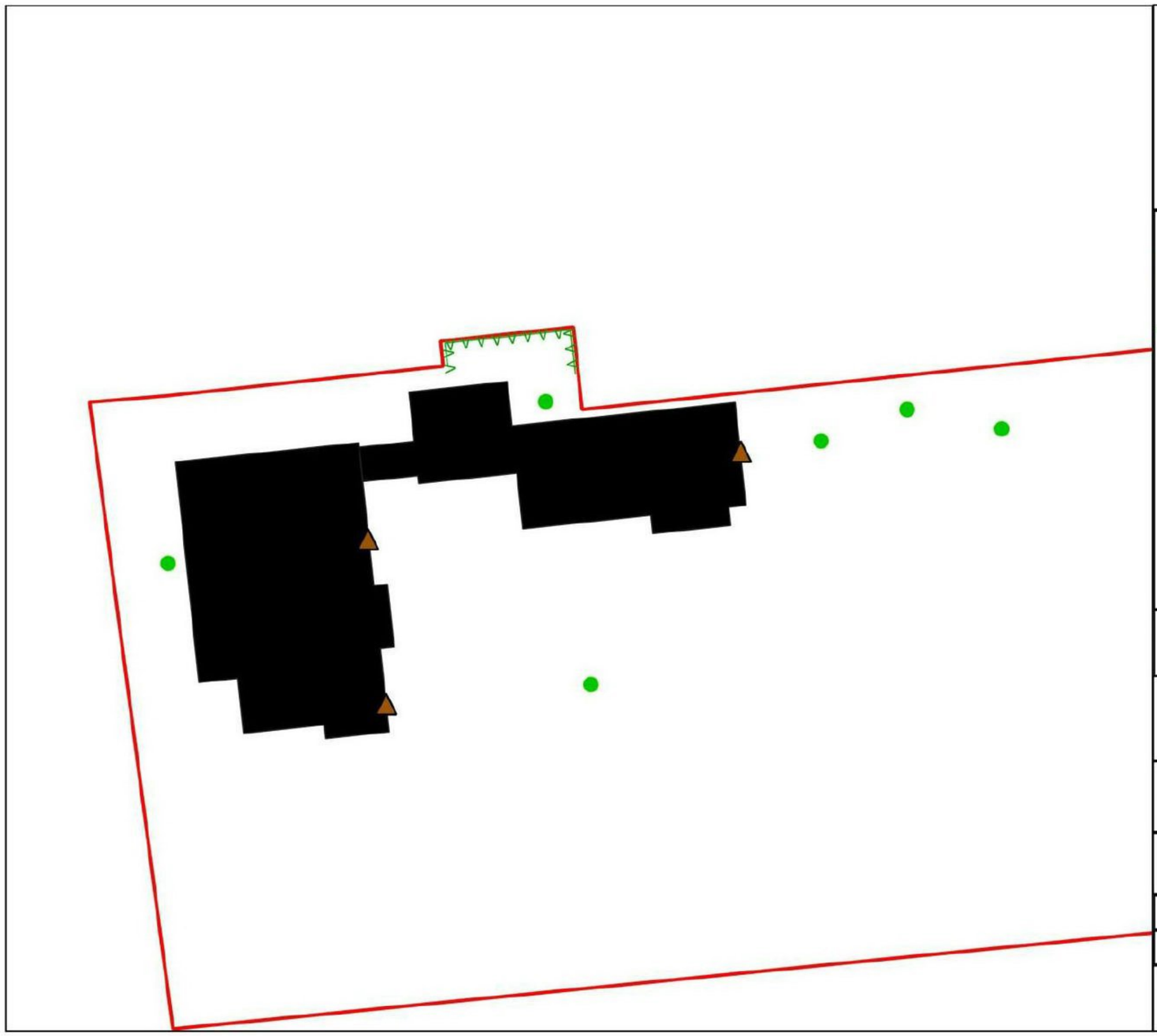
Figure 3.1 - Preliminary Roost Assessment results

0 1 2 3 4 m

Date: 02.11.21

Drawing Version: 1

Drawn by: Perry Hockin
Checked by: David Kavanagh-Spall



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LEGEND

- Site boundary
- Proposed building
- Species rich hedgerow
- Bat and bird boxes
- Planting

Client: Ben Parfitt

Project: DKS/961.1 Chiswell Barn

Figure 6.1 - Recommendations

0 5 10 m

Date: 02.11.21

Drawing Version: 1

Drawn by: Perry Hockin
Checked by: David Kavanagh-Spall

APPENDIX A Wildlife Legislation

The Wildlife and Countryside Act 1981 (as amended)
Schedule 1
Applies to all wild birds where it is an offence:

- to take, damage or destroy a nest whilst it is being built or in use
- to kill, injure or take any wild bird (subject to certain exceptions)
- to take or destroy the egg of any wild bird.

It is also an offence to disturb any wild bird listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended)

- while it is nest building
- at a nest containing eggs or young
- to disturb the dependant young of any such bird.

Schedule 5
For animals fully protected under Schedule 5 which includes, the hazel dormouse, otter *Lutra lutra*, great crested newt and all bats,. It is an offence:

- to intentionally kill or injure or take these species
- to intentionally or recklessly damage or destroy or obstruct access to any structure or place which a species uses for shelter or protection, at any time even if the animal is not present.
- to intentionally or recklessly disturb whilst it is occupying a place which it uses for shelter or protection.

Adder, grass snake, common lizard and slow worm are protected from being killed or injured.

Schedule 8
Specific species of plants listed in Schedule 8 are protected. It is an offence: to intentionally pick, uproot or destroy a wild plant listed in Schedule 8.

Schedule 9
Invasive non-native species are listed under Schedule 9. It is an offence:

- to plant or otherwise cause to grow in the wild.
- If soils are contaminated by invasive non native plant species it becomes classified as
- '*controlled waste*' under the Environmental Protection Act 1990 (England, Wales & Scotland),
- and must be disposed of accordingly.

The Conservation of Habitat and Species Regulations 2017
Schedule 2 applies to all European Protected Species (EPS) which included all bat species, great crested newts, otter and dormice. The protection afforded is overlapping but separate from the Wildlife and Countryside Act 1981 (as amended)

c) obstructing access to any entrance of a sett
d) disturbing a badger when occupying a sett
Where interference with a badger sett cannot be avoided during development, a licence from Natural England should be applied for.

APPENDIX B Site Photographs

Figure B.1 Main house looking north west showing small boiler room 'add-on'

Figure B.2 Main house looking west, partially obscured by T1

Figure B.3 studio to the left with T1 to the right amongst area of introduced shrub

Figure B.4 studio to be demolished and replaced with extension covering area within shot. H2 visible in background.

Figure B.5 driveway looking east from front of the house with T2 foliage visible in foreground. Shed to be removed.

APPENDIX C Tree mitigation and compensation

Facilitation pruning

The proposed development falls within the southern crown spreads of T2 and H2 and as such facilitation pruning to these trees will be necessary to allow construction and adequate roof clearance for the proposed dwelling. Crown works to T9 and T11 should be limited to the removal and or reduction of small diameter tertiary and or secondary branches, where the final cut is less than 1/3rd of the parent branch or to a suitable growth point in line with BS 3998 (2010), **primary branches should not be removed to facilitate development**. This facilitation pruning will result in better clearance for the proposed development and should be undertaken before building works commence. All works are specified within table 2 and must adhere to BS 3998 (2010) good practice.

Soil Amelioration

Where recommendations within table 2 state that trees would benefit from soil amelioration; a simple, cost effective technique can be applied without the need for specialist equipment:

Decompaction of soil or turf is achieved by gentle lifting of the medium using a garden fork; without turning the soil, the fork is inserted (300mm spacing) and levered backwards and forwards in order to create more space for roots to exist within an environment conducive to healthy development.

Top dressing / mulching involves the addition of a layer (no deeper than 150mm at one time) of inert or well composted medium. Addition of fresh (uncomposted) material has the potential to burn root systems, as well as draw out nutrients from the soil (in the short term) and should not be used.