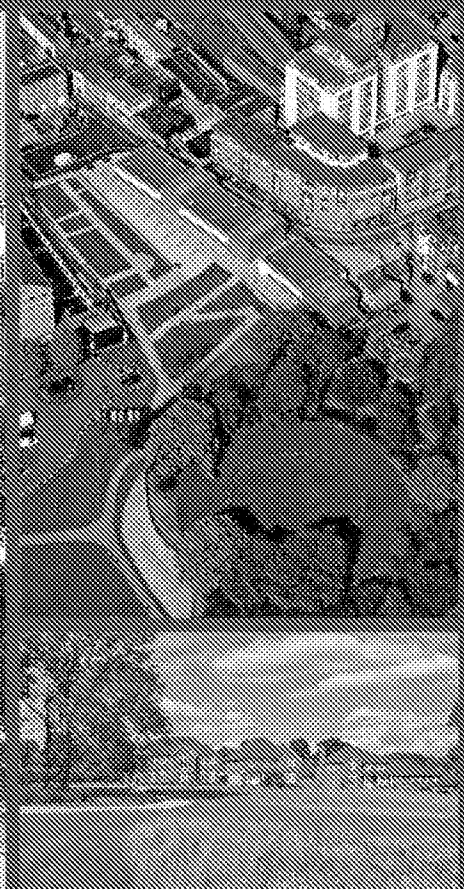




Land west of Anndel Road,
Angmering

Ecological Impact Assessment

Prepared by
CSA Environmental

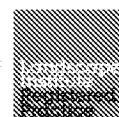
on behalf of
Gladman Developments

Report No: CSA/3467/07

July 2019

This report may contain sensitive ecological information. It is the responsibility of the Local Authority to determine if this should be made publicly available.

Report Reference	Date	Revision	Prepared by	Approved by	Comments
CSA/3467/07	31/07/2019	-	JT	KC	Draft for comment



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Appendices

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Appendix B: Legislation, Planning Policy and Standing Advice

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EXECUTIVE SUMMARY

Mixed development is proposed at Land west of Arundel Road, Angmering, for which outline planning permission will be sought.

CSA Environmental was instructed by Gladman Developments to undertake an Ecological Impact Assessment (EcIA) of the Site to identify important ecological features that could potentially be affected by the proposed development. To inform this assessment, the following surveys have been undertaken:

- Desk study (September 2017)
- Extended Phase 1 Habitat survey (September 2017)
- Building inspection for bats (September 2017)
- Bat activity transects (September 2017 – June 2018)
- Bat remote monitoring (September 2017– June 2018)
- Bat emergence / return to roost surveys (September 2017– June 2018)
- Dormouse surveys (April – September 2018)
- Badger survey (May 2018)
- GCN pond habitat suitability assessment (December 2017)
- GCN surveys (April - May 2018)
- Reptile surveys (April – June 2018)

The following important ecological features are considered to have potential to be subject to adverse effects and/or breaches of legislation as a result of the proposed development, in the absence of mitigation:

- Hedgerows and Trees
- Bats
- Dormice
- Badgers
- Other Mammals
- Nesting birds
- Reptiles
- Amphibians

In the absence of any mitigation measures, the proposed development is anticipated to result in, at most, adverse effects significant at the Local level. However, with the implementation of some straightforward mitigation measures as proposed with this scheme, the development is not anticipated to result in any residual significant adverse effects to important ecological features. The Development Framework Plan will deliver net benefits for wildlife in the form of additional habitats, with the opportunity to provide additional biodiversity enhancement measures alongside the new housing.

Based on successful implementation of mitigation, compensation and enhancement, as set out within the Ecology Mitigation and Enhancement Strategy (CSA/3467/09), the scheme has the scope to accord with all relevant nature conservation legislation, as well as with the provisions of the Arun District Council Local Plan 2003, Draft Local Plan 2014 and Angmering Neighbourhood Plan 2014.

1.0 INTRODUCTION

1.1 This report has been prepared by CSA Environmental on behalf of Gladman Developments. It sets out the findings of an Ecological Impact Assessment (EcIA) of proposed development at Land west of Arundel Road, Angmering – EcIA, Angmering (hereafter ‘the Site’). Mixed development is proposed at the Site, for which outline planning permission will be sought, with all matters reserved apart from access.

1.2 The scope of this assessment has been determined with due consideration for best-practice guidance provided by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2016) and the Biodiversity: Code of practice for planning and development published by the British Standards Institute (BS 42020:2013).

1.3 The Site occupies an area of c. 9.1ha and is located around central grid reference TQ 065 053, to the north of Angmering. It consists of an arable field with an area of semi-improved grassland, bounded by mature hedgerows and woodland, and developed land to the east (both a residential plot and commercial units) (see Habitats Plan in Appendix A).

1.4 An initial desk study and extended Phase 1 Habitat survey were undertaken for the Site in September 2017, the findings of which are presented herein. In addition, the following further survey work was undertaken in 2017 and 2018:

- Desk study (September 2017)
- Extended Phase 1 Habitat survey (September 2017)
- Building inspection for bats (September 2017)
- Bat activity transects (September 2017 – June 2018)
- Bat remote monitoring (September 2017– June 2018)
- Bat emergence / return to roost surveys (September 2017– June 2018)
- Dormouse surveys (April – September 2018)
- Badger survey (May 2018)
- Reptile surveys (April – June 2018)
- GCN pond habitat suitability assessment (December 2017)
- GCN surveys (April - May 2018)

1.5 This EcIA aims to:

- Establish baseline ecological conditions at the Site.
- Identify any likely significant effects of the proposed development, in the absence of mitigation, including cumulative impacts.
- Set out any ecological measures necessary to effectively avoid or mitigate likely significant effects, and identify residual impacts.
- Identify any compensation measures required to offset residual impacts.

- Set out potential ecological enhancement measures that may be delivered by the proposed scheme.
- Confirm how proposed mitigation, compensation and enhancement measures will be secured.
- Provide sufficient information to determine whether the project accords with relevant nature conservation policies and legislation, and where appropriate, to allow conditions or obligations to be proposed by the relevant authority.

1.6 An Ec IA can be used for the appraisal of projects of any scale. This is a best practice evaluation process, recommended by CIEEM (2018). It is intended that the evaluation of findings presented here-in will aid the Arun District Council in their review of the outline application.

2.0 LEGISLATION, PLANNING POLICY & STANDING ADVICE

Legislation

2.1 Legislation relating to wildlife and biodiversity of particular relevance to this EcIA includes:

- The Conservation of Habitats and Species Regulations 2017
- The Wildlife and Countryside Act 1981 (as amended)
- The Natural Environment and Rural Communities (NERC) Act 2006
- The Protection of Badgers Act 1992

2.2 This above legislation has been addressed, as appropriate, in the production of this report. Further information on the above legislation is provided in Appendix B.

National Planning Policy

2.3 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2019) sets out the government planning policies for England and how they should be applied. Chapter 15: Conserving and Enhancing the Natural Environment, is of particular relevance to this report as it relates to ecology and biodiversity. Further details are provided in Appendix B.

2.4 The Government Circular 06/2005, which is referred to by the NPPF, provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.

Local Planning Policy

2.5 A number of local planning policies relate to ecology, biodiversity and/or nature conservation. These are summarised in Table B.1 of Appendix B. These policies have been addressed, as appropriate, in the production of this report.

Standing Advice

2.6 Natural England Standing Advice regarding protected species aims to support local authorities and forms a material consideration in determining applications in the same way as any individual response received from Natural England following consultation. Standing advice has therefore been given due consideration, alongside other detailed guidance documents, in the scoping of ecological surveys and production of this report.

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3.0 METHODS

Desk Study

- 3.1 The Multi-Agency Geographic Information for the Countryside (MAGIC) online database was reviewed in September 2017 to identify the following ecological features (based on the likely 'zone of influence' of such features):
- Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites within 10km of the Site
 - Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature Reserves (LNR) within 3km of the Site
 - Other relevant data e.g. Ancient Woodland Inventory within 1km of the Site
- 3.2 Sussex Biological Records Centre (SxBRC) was contacted for details of any non-statutory designated wildlife sites and records of protected/notable habitats and species. This information was requested for an area encompassing the Site and adjacent land within c. 3km of its central grid reference. This search area was selected to include the likely zone of influence of effects upon non-statutory designations and protected or notable habitats and species.
- 3.3 The Woodland Trust's online Ancient Tree Inventory was reviewed for known ancient or veteran trees within the Site and adjacent land.
- 3.4 In accordance with Natural England's Great Crested Newt (GCN) Mitigation Guidelines (2001), a desktop search was undertaken to identify ponds within 500m of the Site which may have potential to support breeding GCN *Triturus cristatus*, using Ordnance Survey (OS) mapping, the MAGIC database and aerial photography.
- 3.5 All relevant desk study data are presented in Appendix C.

Field Surveys

Extended Phase 1 Habitat Survey

- 3.6 An extended Phase 1 habitat survey was carried out in fine and dry weather conditions on 06 September 2017 by Clare Caudwell MCIEEM and Jessica Tait GradCIEEM, encompassing the Site and immediately adjacent habitats that could be viewed.
- 3.7 Phase 1 Habitat survey is a method of classification and mapping wildlife habitats in Great Britain. It was originally intended to provide "...relatively rapidly, a record of the semi-natural vegetation and wildlife habitat over large areas of countryside." The Phase 1 Habitat Survey method has been widely 'extended' beyond its original purpose to allow the capture

of information at an intermediate level between Phase 1 and Phase 2 Habitat surveys. Here, the standard survey method has been 'extended' in this report to include the following:

- More detailed floral species lists for each identified habitat
- Descriptions of habitat structure, the evidence of management and a broad assessment of habitat condition
- Mapping of additional habitat types (e.g. hard standing)
- Identification of Priority Habitats under Section 41 of the NERC Act (S41 habitats)
- Identification of Habitats Directive Annex I habitat types
- Evidence of, or potential for, European Protected Species (EPS) (including bats, GCN, dormouse and otter)
- Evidence of, or potential for, other protected species (including birds, reptiles, water vole, badger and certain invertebrates)
- Evidence of, or potential for, other notable species (including S41 Species of Principle Importance as well as notable, rare, protected or controlled plants and invertebrates)

- 3.8 Results of the extended Phase 1 Habitat survey are presented on the Habitats Plan in Appendix A. Appendix D provides a list of floral species recorded in each habitat.

Further Survey Work

- 3.9 The following detailed field survey work was carried out in 2017 and 2018, with full methods and results provided in the relevant Appendices:

- Bat building inspection, emergence/return to roost surveys and activity surveys (Appendix F)
- Dormouse surveys (Appendix G)
- Badger survey (Appendix H)
- Reptile surveys (Appendix I)
- GCN pond habitat suitability assessments and surveys (Appendix J)

Limitations

- 3.10 There were no specific limitations to the desktop study or extended Phase 1 habitat survey, which was conducted at an optimum time of year and in good conditions. Limitations to protected species surveys are addressed in the relevant appendices.

Evaluation and Assessment

- 3.11 Ecological features are identified, evaluated and assessed with due consideration for the CIEEM Guidelines for Ecological Impact Assessment (2018), with detailed methods provided in Appendix E. It is, however, an established principle (CIEEM, 2018) that EcIA is an iterative process. Specialist advice on the avoidance and mitigation of the

potential negative effects of the proposed development has been input from an early design stage.

- 3.12 It is also an established principle (CIEEM, 2018) that, wherever possible, potential negative effects should be avoided by 'embedded mitigation' or 'mitigation-by-design', as this gives more certainty over delivery, and demonstrates a well-designed scheme. This also ensures correct application of the 'Mitigation Hierarchy' (as advocated by BS42020:2013, and CIEEM, CIRIA & IEMA 2016).

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4.0 BASELINE ECOLOGICAL CONDITIONS

Nature Conservation Designations

Statutory

- 4.1 There are no statutory nature conservation designations covering any part of the Site.
- 4.2 One statutory European wildlife site was identified within 10km of the Site; Arun Valley Special Area of Conservation (SAC), Special Protection Area (SPA) and wetland of international importance (Ramsar) located c. 8.5km north-west of the Site. Given the legislative frameworks underpinning the designation of European sites, this is considered to be important at the International level.
- 4.3 No national or local statutory nature conservation designations were identified within 3km of the Site.
- 4.4 These statutory designations are described in Table 1 below.

Non-Statutory

- 4.5 Five local non-statutory nature conservation designations were identified within 3km of the Site; the closest sites are Polling Copse Local Wildlife Site (LWS) c. 2km west-north-west of the Site, which is a large semi-natural ancient woodland parcel, and Highdown Hill & the Miller's Tomb LWS c. 2km east-south-east, which is an area of chalk grassland that supports several uncommon plants and animals. These non-statutory sites are described in Table 1 below.
- 4.6 As LWS's are designated according to criteria applied in a county context, these sites are considered to be ecologically important at the County level.

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Table 1. Statutory and non-statutory designations within search radii

Site Name & Designation	Distance & Direction from Survey Area	Brief Description of Designated Site
European Designations within 10km		
Arun Valley Special Area of Conservation (SAC), Special Protection Area (SPA) and wetland of international importance (Ramsar)	c. 8.5km north-west	The site consists of low-lying grazing marsh with an area of peat derived from a relict raised bog. Variation in soils and water supply lead to a wide range of ecological conditions and hence a rich flora and fauna. The ditches and margins between grazing marsh fields have an outstanding aquatic flora and invertebrate fauna. The Arun Valley supports important numbers of wintering waterbirds, which feed in the wetter, low-lying fields and along ditches. <u>SAC reasons for designation</u> Annex II species that are a primary reason for selection of this site: 4056 Ramshorn snail <i>Anisus vorticulus</i> The Arun valley is one of the three main population centres for this species in the UK. This proposed site includes two of its core sites in the wash lands of the Arun floodplain (Pulborough Brooks and Amberley Wild Brooks SSSIs). <u>SPA reasons for designation</u> Overwinter the site supports Bewick's Swan <i>Cygnus columbianus bewickii</i>, 115 individuals representing at least 1.6% of the wintering population in Great Britain (5 year peak mean for 1992/93 to 1996/7). The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl. <u>Ramsar reasons for designation</u> Ramsar criterion 2: The site holds seven wetland invertebrate species listed in the British Red Data Book as threatened. One of these, <i>Pseudamnicola confusa</i>, is considered to be endangered. The site also supports four nationally rare and four nationally scarce plant species. Ramsar criterion 3: In addition to the Red Data Book invertebrate and plant species, the ditches intersecting the site have a particularly diverse and rich flora. All five British duckweed <i>Lemna</i> species, all five water-cress <i>Rorippa</i> species, and all three British water milfoils <i>Myriophyllum</i> species, all but one of the seven British water dropworts <i>Oenanthe</i> species, and two-thirds of the British pondweeds <i>Potamogeton</i> species can be found on site. Ramsar criterion 5: Assemblages of international importance: Species with peak counts in winter: 13774 waterfowl (5 year peak mean 1998/99-2002/2003).

National Designations within 3km		
N/A	-	-
Local Designations within 3km		
N/A	-	-
Non-statutory Designations within 3km		
Poling Copse Local Wildlife Site (LWS)	c. 2.0km west- north-west	A large (51ha) block of ancient, semi-natural woodland. Ancient sections consist mostly of Hazel coppice <i>Corylus avellana</i> with Ash <i>Fraxinus excelsior</i> and Oak <i>Quercus robur</i> standards; more recent woodland is dominated by Sycamore <i>Acer pseudoplatanus</i> with some Hazel, Oak and Ash.
Highdown Hill & the Miller's Tomb LWS	c. 2.0km east- south-east	A 22.9ha chalk grassland site, mostly unimproved with some species-rich areas. Although heavily used for informal recreation, the site supports several uncommon plants and animals. A mosaic of short turf, taller herbs and scrub makes the site a valuable habitat for invertebrates, including Carthusian snail <i>Monacha cartusiana</i> (Red Data Book species), Long-winged Cone-head <i>Conocephalus discolor</i> , Common Lizard <i>Zootoca vivipara</i> , Glow-worm <i>Lampyris noctiluca</i> , the scarce Chalkhill Blue <i>Polyommatus coridon</i> and 17 commoner butterfly species; and a range of birds, including occasional Nightingales <i>Luscinia megarhynchos</i> .
Warningcamp Hill and New Down LWS	c. 2.5km north- west	Designated for its herb-rich chalk grassland, including some extensive patches of Burnet Rose <i>Rosa pimpinellifolia</i> , an uncommon plant in West Sussex. The site also supports a remnant of ancient semi-natural woodland and areas of mixed scrub.
Titnore & Goring Woods Complex LWS	c. 2.5km east	Largest woodland complex in Worthing Borough (78.6ha), much of it ancient in origin, although its structure and species composition vary considerably due to management. The site is important as a large area of semi-natural habitat close to a heavily built-up area.
Clapham Wood LWS	c. 2.9km north- east	An extensive (155.8ha), ancient semi-natural woodland on the undulating dip slope of the South Downs. Its rich ground flora includes a number of notable species: Wood Anemone <i>Anemone nemorosa</i> (ancient woodland indicator species), Bluebells <i>Hyacinthoides non-scripta</i> and Early-purple Orchid <i>Orchis mascula</i> . Tuberous Comfrey <i>Symphytum tuberosum</i> , a very rare plant in West Sussex occurs along a track. Clapham Wood also has a moderately diverse range of breeding birds, including Goldcrest <i>Regulus regulus</i> , Chiffchaff <i>Phylloscopus collybita</i> , Blackcap <i>Sylvia atricapilla</i> , Treecreeper <i>Certhia familiaris</i> , Marsh Tit <i>Poecile palustris</i> , Nuthatch <i>Sitta europaea</i> , Cuckoo <i>Cuculus canorus</i> , Great Spotted Woodpecker <i>Dendrocopos major</i> and Green Woodpecker <i>Picus viridis</i> .

Ancient Woodland

- 4.7 There is no designated Ancient Woodland covering any part of the Site or immediately adjacent land. No trees on or adjacent to Site are listed on the Ancient Tree Inventory. Habitats and Flora

Notable Flora Records

- 4.8 The SxBRC provided records of 27 notable plant species, one lichen and one moss species from within the search area. Those of potential relevance to the Site include the arable weeds corncockle *Agrostemma githago*, corn marigold *Glebionis segetum* and cornfield knotgrass *Polygonum rurivagum*, wild strawberry *Fragaria vesca* and calcareous-favouring species crosswort *Cruciatulae vipes*.

Habitats

- 4.9 The following habitats were recorded on-site and classified in line with current Phase 1 habitat species guidance (JNCC, 1990), as illustrated in Appendix A. Photographs of the Site can be found in Appendix A, with photographs of buildings included within the bat report in Appendix F. An indicative botanical species lists for each habitat is provided in Appendix D.

Arable

- 4.10 Much of the Site comprises a large arable field, which was straw stubble at the time of survey. The field margins are c. 1m wide and comprise grass and arable weeds such as fumitory *Fumaria* spp. and sun spurge *Euphorbia helioscopia*.

Semi-improved grassland

- 4.11 The northern third of the main field comprises semi-improved grassland, which is mostly grass-rich with frequent Timothy *Phleum pratense* and COCK'S-FOOT *Dactylis glomerata* in the relatively short sward. Herb species included common species such as selfheal *Prunella vulgaris*, St. John's wort *Hypericum* sp. and locally abundant silverweed *Potentilla anserina*, common fleabane *Pulicaria dysenterica*, and rush *Juncus* sp. along the eastern woodland edge, indicating wetter conditions in this area.
- 4.12 There is semi-improved grassland along the banks either side of the access road, with species including tufted vetch *Vicia cracca*, agrimony *Agrimonia eupatoria*, wild strawberry *Fragaria vesca*, hedge bedstraw *Galium album*, greater stitchwort *Stellaria holostea*, and crosswort *Crucianella stylosa* which is characteristic of calcareous soils.

Buildings and hardstanding

- 4.13 As shown on the Habitats Plan (CSA/3467/102), there are a number of buildings on-site comprising a residential dwelling and associated out-buildings (B1, B15, B16), a camp site (B17), a small industrial estate (B2 to 12) and three derelict buildings (B8, 13 and 14). These are surrounded by

hard-standing with a surfaced access road stretching to Arundel Road in the east.

- 4.14 The residential bungalow is a single storey building of brick construction with clay roof tiles, and a number of features were noted which are suitable for roosting bats, such as lifted tiles which could provide access between tiles and internal roof lining.
- 4.15 A small partially collapsed barn (B13) is present within the 'Severn Acre Plot' in the north-eastern part of the site overgrown by ivy and scrub, which could also be used by bats as a night roost / feed perch. A second derelict building (B8) is present along the southern boundary, which is overgrown with ivy, bramble scrub and a young ash tree.
- 4.16 The commercial buildings are of varying construction, many with corrugated asbestos roofing; some had features which are suitable for bats (e.g. lifted fascia boards / crevices in brickwork), and many were suitable for roosting birds, particularly for opportunistic species such as swallows *Hirundo rustica* and pigeons *Columba* spp.

Amenity grassland

- 4.17 There is a small area of amenity grassland at the Site comprising a private garden and adjacent area of grass used as a caravan/camp site. It is short mown and predominantly perennial rye grass *Lolium perenne* with a few herbs such as white clover *Trifolium repens*.

Colonising ground and tall ruderal

- 4.18 As identified on the Habitats Plan, colonising vegetation is present within the industrial estate and surrounding the northernmost derelict building (B13) where areas of bare ground have been left unmanaged. These areas are characterised by pioneering species such as bristly ox-tongue *Helminthotheca echioides*, bittercress *Cardamine* sp., ribwort and buckshorn plantain *Plantago major/coronopus*, black medick *Medicago lupulina*, scarlet pimpernel *Anagallis arvensis* and field mallow *Malva sylvestris*. The north-eastern plot contains more developed vegetation including common nettle *Urtica dioica*, ox-eye daisy *Leucanthemum vulgare*, ragwort *Senecio jacobaea*, greater willowherb *Epilobium hirsutum* and hemp agrimony *Eupatorium cannabinum*.

Hedgerows and trees

- 4.19 There are nine hedgerows across the Site, as identified on the Habitats Plan. Six of these are characterised as species rich by having five or more native woody species within them. The arable field is bounded by mature species-rich hedges to the east and west (H4 & H6), a deciduous woodland edge to the north and mature tree belt on top of a bank to the south (H5). There are also tall native hedgerows along the eastern Site boundary (H2, H3, H7, H8, and H9) and a pruned hedgerow south of

the bungalow (H1). The Site is bounded to the north by a woodland edge, with mature trees overhanging the Site by c. 6m.

- 4.20 There is a mature apple tree *Malus* spp. and some conifers in the residential garden, in addition to a number of mature trees within the hedgerows which bound the Site.

Scrub

- 4.21 There is dense scrub dominated by bramble *Rubus fruticosus* agg. along the boundary between the arable field and commercial plot, and in the north-eastern corner of the Site, and scattered scrub along hedgerows in the south-western and north-eastern corners of the Site.

Pond

- 4.22 There is a small ornamental pond in the residential garden, which is plastic-lined and has a stone margin. Plant species include water lily *Nymphaea* spp. and waterweed *Elodea* spp. Goldfish were noted during the GCN surveys.

Importance

- 4.23 Hedgerows are an S41 habitat, with high intrinsic ecological value, so are considered to be important at the Local level.
- 4.24 Both wild strawberry and crosswort were recorded on Site and are listed as near threatened on the IUCN Red List, so are of local importance. However, they were only present within a very limited patch of habitat along the side of the access road. Overall, grassland habitat is not considered to be more important than Site level.
- 4.25 The remaining habitats onsite are not considered to be more important than Site level, so are not considered further in this report.

Fauna

Bats

- 4.26 SxBRC provided 13 bat records from within the search area, including the following species: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and brown long-eared bats *Plecotus auritus*. The closest record is c. 245m south-east of the site and is of a garage which provides a feeding roost where an unspecified pipistrelle species was present in 2014.
- 4.27 The arable field, which dominates the site, is of generally low suitability for foraging bats. However, trees and hedgerows along the boundaries support foraging and dispersal opportunities, as do those in the residential garden. The garden pond further enhances foraging suitability by encouraging insects. Treeline / hedgerow borders also provide connectivity to habitats and resources in the wider landscape,

including the adjoining parcels of mature deciduous woodland to the north and east of the site.

Roosting Bats

- 4.28 Under the current development proposals, no trees considered to hold potential roosting opportunities for bats will be lost. Although the trees along the southern boundary are of a sufficient size, they are in good condition do not exhibit any features suitable to support roosting bats.
- 4.29 A number of the onsite buildings were noted to have features suitable to support roosting bats during the Phase 1 survey (e.g. features such as lifted tiles and gaps beneath cladding). A number of trees adjacent to northern and western Site boundaries were also noted to have features suitable for roosting bats.
- 4.30 Of the 17 buildings identified on-site, one building was assessed as having moderate potential to support roosting bats (B1), four as having low potential (B2, B3, B4 and B13), and two low to negligible potential (B8, B9), with the remainder having negligible potential. Internal inspections of B1, B8, B9 and B13 did not reveal any evidence of past or current use by roosting bats.
- 4.31 Bat emergence / return to roost surveys completed in 2018 revealed that roosting bat(s) are present within B3 and B4, with a single common pipistrelle observed emerging from B3, and a soprano pipistrelle from B4.
- 4.32 Given the low level of roosting activity recorded, by individual / low numbers of common and soprano pipistrelle bats (two of the most common and widespread of the UK bats species), the roost(s) identified are considered to be of low conservation significance. However, given the legal protection and S41 status of bats, overall the Site is considered to be important at up to the Local level for roosting bats.

Foraging / Commuting Bat Activity

- 4.33 During the bat emergence / return to roost, transect surveys and static monitoring undertaken across the Site, at least eight species of bat were recorded. Bat activity was predominantly recorded along the Site boundaries, particularly along the northern Site boundary, which is a woodland edge with a stream and ponds to the north, and western hedgerow; species diversity was also greater at these locations. Activity was dominated by common pipistrelle and soprano pipistrelle calls (peak of 20.78 passes / hours at MP1 for soprano pipistrelle, and 22.08 passes / hours for common pipistrelle at MP3 during static monitoring), with a large number of Myotis species calls along the woodland edge (index of 19.64 passes / hour at MP1). During the remote monitoring surveys 96 barbastelle *Barbastellus barbastellus* calls (indices less than one pass / hour for barbastelle at MP1, 2 and 3.), 49 noctule *Nyctalus noctula* calls and 13 brown long-eared calls (all at less than one pass /

hour at static monitoring points) were recorded. Serotine *Eptesicus serotinus* and Nathusius' pipistrelle were also recorded during the activity transects. Full results are provided in Appendix F.

- 4.34 Using the method provided by Wray et al. (2010) to evaluate the importance foraging and commuting habitats for bats (see Table 2), county value is assigned for common and some rarer species (common pipistrelle, soprano pipistrelle, Myotis species, noctule, Nathusius pipistrelle, and serotine), local for brown long-eared, and regional for barbastelle, due to its rarity.
- 4.35 Given the low level of activity recorded in relation to some of these species (i.e. less than one pass per hour for Myotis species, barbastelle, noctule, Nathusius pipistrelle and brown long-eared; serotine single pass only recorded during transect) across the majority of the Site, and the large proportion of arable land, buildings and hardstanding at the Site which are likely to be of some limited value to bats, it is considered that a more accurate assessment of the importance of the Site for foraging and commuting bats is Local level importance for most bat species, and County importance for barbastelle, due to its rarity. Marginal woodland and hedgerow habitats to the north and west being of greatest importance for foraging, for all species including Myotis and barbastelle in particular.

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Table 2: Valuation of bat foraging and commuting habitat at the Site (following Wray et al (2010) evaluation criteria)

Species	Rarity	No. of bats	Roosts/potential roosts nearby	Commuting habitat	Foraging habitat	Total score	Calculated Importance	Adjusted Importance
Common pipistrelle	Common (2)	Small number (10)	Moderate number (4) – 1 roost present on-site, 4 roost records within 1km from SxBRC, and 2 records of pipistrelle species roosts, including a maternity roost	Well-grown and well-connected hedgerows, small field sizes (4)	Larger, or connected woodland blocks, mixed agriculture, and small villages/hamlets (4)	24	County	Local
Soprano pipistrelle	Common (2)	Small number (10)	Small number (3) – 1 roost present on-site, 2 roost records for pipistrelle species within 1km radius from SxBRC, including a maternity roost	Well-grown and well-connected hedgerows, small field sizes (4)	Larger, or connected woodland blocks, mixed agriculture, and small villages/hamlets (4)	23	County	Local
Myotis species	Rare (5)	Small number (10)	Small number (3) – no roost records within 1km radius from SxBRC, and moderate amount of activity recorded during surveys	Well-grown and well-connected hedgerows, small field sizes (4)	Larger, or connected woodland blocks, mixed agriculture, and small villages/hamlets (4)	26	County	Local
Noctule	Rare (5)	Individual (5)	Small number (3) – no roost records within 1km radius from SxBRC, and low amount of activity recorded during surveys	Well-grown and well-connected hedgerows, small field sizes (4)	Larger, or connected woodland blocks, mixed agriculture, and small villages/hamlets (4)	21	County	Local
Nathusius pipistrelle	Rare (5)	Individual (5)	Small number (3) – 2 roost records for pipistrelle species within 1km radius from SxBRC, including a maternity roost, and low activity recorded during surveys	Well-grown and well-connected hedgerows, small field sizes (4)	Larger, or connected woodland blocks, mixed agriculture, and small villages/hamlets (4)	21	County	Local

Brown long-eared	Common (2)	Individual (5)	Small number (3) – 3 roost records within 1km radius from SxBRC, and low amount of activity recorded during surveys	Well-grown and well-connected hedgerows, small field sizes (4)	Larger, or connected woodland blocks, mixed agriculture, and small villages/hamlets (4)	18	Local	Local
Barbastelle	Rarest (20)	Individual (5)	Small number (3) – no roost records within 1km radius from SxBRC, and low amount of activity recorded during surveys	Well-grown and well-connected hedgerows, small field sizes (4)	Larger, or connected woodland blocks, mixed agriculture, and small villages/hamlets (4)	36	Regional	County
Serotine	Rarer (5)	Individual (5)	Small number (3) – no roost records within 1km radius from SxBRC, and low amount of activity recorded during surveys	Well-grown and well-connected hedgerows, small field sizes (4)	Larger, or connected woodland blocks, mixed agriculture, and small villages/hamlets (4)	21	County	Local

Dormouse

- 4.36 SxBRC provided two records of dormouse *Muscardinus avelanarius* within the search area. The most recent record was from 2015, from the Oval Racecourse c. 950m east of the Site, with little habitat connectivity to the Site. The second record was of feeding signs in Butler's Copse, a patch of Ancient Woodland c. 950m north of the Site across the A27, which may act as a barrier to dispersal for dormice.
- 4.37 Eight species-rich and one species-poor hedgerows are present on-Site and dormice are known to live permanently within hedgerows, which can provide a continuous food resource throughout the active season, with unmanaged, diverse hedgerows most optimal. The hedgerows on-site showed some evidence of management and were found to be comprised mainly of hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, elm *Ulmus* sp. and bramble *Rubus fruticosus* agg., with occasional hazel *Corylus avellana*, ash *Fraxinus excelsior*, dog rose *Rosa canina* sp. and oak sp. *Quercus* sp.. While some of these hedgerows are not considered to offer high quality opportunities for dormice, they do act to connect more optimal habitats in the wider surrounds.
- 4.38 Dense patches of scrub are present at the Site along the eastern boundaries of the arable field and within the north eastern corner of the Site. Dense scrub provides suitable habitat for dormice to persist as the vegetation provides a food resource for a large part of the dormouse active season and is frequently used for hibernation. These scrub patches are connected to the boundary hedgerows and there is potential for dormice to be present within and to be utilising this scrub habitat.
- 4.39 The dormouse survey recorded dormice in the eastern and western hedgerows (H2 and H6) with a peak count of two individuals, and six likely dormouse nests along the woodland edge, eastern and western hedgerows (H3, H6 and H9). As a European Protected Species the population will be of at least Local importance given their local distribution and conservation status.

Badger

- 4.40 SxBRC do not provide records of badger *Meles meles* as this is considered sensitive information. Arable and grassland habitats on-site offer limited suitability for foraging, and the hedgerows and scrub along the boundaries provide cover for setts.
- 4.41 Signs of badger activity and a badger sett were observed on Site. Full details have not been included here for confidentiality reasons, to protect badgers. Further information has been included within a separate badger report (CSA/3467/06).

- 4.42 Badgers are common and widespread and of no local or national conservation concern, but their setts are strictly protected under the Protection of Badgers Act 1992.
- 4.43 The habitat used by badgers is to be retained and buffered by new planting as part of the proposed development, therefore impacts upon badgers have been scoped out of the assessment, but mitigation measures to ensure adherence to legislation have been included.

Riparian Mammals

- 4.44 SxBRC provided 17 records of water vole *Arvicola amphibius* within the search area. All records are c. 900m south of the Site within Angmering itself, most associated with Black Ditch stream which runs through the woodland to the north of the Site, and the most recent is from 2016. While potentially suitable habitat for water voles may be provided by the stream within the woodland immediately north of the site (which is connected to Black Ditch), this habitat is outside of the Site boundary and not likely to be impacted by proposals. Water vole will therefore not be considered further.

Other Mammals

- 4.45 SxBRC provided 12 records of hedgehog *Erinaceus europaeus* from within the search area, the closest c. 30m east of the Site within the woodland patch, recorded in 2015. Hedgehogs were observed in the south-east of the site during the bat emergence / return to roost surveys, on two occasions in 2018. Hedgehogs are a S41 priority species. On-site opportunities for hedgehogs are provided by the hedgerow bases along the site borders and shrubs within the residential garden. However, the habitats present at the Site are common and widespread in the local context, and are considered unlikely to support an important population of this species, so will not be considered further.

Birds

- 4.46 SxBRC provided 2726 records of birds from within the search area, 306 of which were notable species. Those notable species which could be present onsite include birds of prey such as red kite *Milvus milvus*, generalists (e.g. herring gull *Larus argentatus*), species associated with woodland and trees (e.g. lesser spotted woodpecker *Dendrocopos minor*), with hedgerows (e.g. dunnock *Prunella modularis*), with grassland (e.g. skylark *Alauda arvensis*) and with buildings (e.g. swallow).
- 4.47 Trees, hedgerows and shrubs provide foraging habitat for small woodland and garden birds, while more open field habitat may provide hunting/scavenging opportunities for larger birds of prey and those which ground nest / feed over open land. All nesting birds are protected under the Wildlife and Countryside Act 1981.

- 4.48 A number of bird species were seen during the site visit, including swallow and feral pigeon *Columba livia domestica* nesting in the metal storage units north of B10, goldfinch *Carduelis carduelis*, blue tit *Cyanistes caeruleus* and blackbird *Turdus merula* within the hedgerows, and wren *Troglodytes troglodytes* was found nesting in a dormouse tube along H5. Ground nesting birds such as skylark could utilise the parcel of semi-improved grassland at the north of the Site, although farming practices may limit its suitability.
- 4.49 The habitats present at the Site are common and widespread in the local context, and are considered unlikely to support an important assemblage of bird species. The bird assemblage of the Site is therefore considered to be of no more than Local value.

Reptiles

- 4.50 SxBRC provided seven records of grass snake *Natrix natrix* dating from 1990-2002, the closest being 550m north-east of the Site in 2002. SxBRC also provided one record of adder *Vipera berus* from 1991 in grid square TQ0605.
- 4.51 The arable field margins, area of colonising ground and scrub in the north-east corner of the Site and parcel of semi-improved grassland provide opportunities for reptiles. A single common lizard was recorded on site during the seven survey visits, indicating a low population of this species is present on the site. It should be noted that common lizards are often under-represented during surveys due to their highly mobile nature. Full details of the surveys are provided in Appendix J.
- 4.52 Common lizards (and all other UK reptile species) are protected under the Wildlife and Countryside Act (1981 and are a S41 species); the reptile population on site is therefore considered of Local importance.

Amphibians

- 4.53 SxBRC provided 11 records of amphibians within the search area, including common frog *Rana temporaria*, common toad *Bufo bufo*, palmate newt *Lissotriton helveticus* and smooth newt *Lissotriton vulgaris*, dating from 1987-2016. No records of GCN *Titurus cristatus* were found within the search area.
- 4.54 The closest record is of 200 common toad in the large pond where the ditch in the adjacent northern woodland terminates, c. 145m north-west of the Site, recorded in 1992.
- 4.55 Onsite aquatic habitat for amphibians is limited to the small garden pond. However, the hedgerows and scrub provide suitable terrestrial habitat for amphibians.
- 4.56 Of the eight mapped ponds within a 500m radius of the Site, one was found to no longer exist (pond 7), five were assessed to have average

suitability to support GCN (ponds 1, 2, 3, 5 and 6) one below average suitability (pond 4), and one poor suitability (pond 8). Results are summarised in Table 3 below, and full results are presented in Appendix G.

Table 3. Summary of the pond habitat suitability assessment for GCN within 500m of land to the west of Arundel Road, Angmering in December 2017 and GCN surveys in spring 2018

Pond number	Distance to Site	HSI Score	Suitability	GCN present/ likely absent
1	On-Site	0.65	Average	Likely absent
2	95m east	0.66	Average	Likely absent
3	250m south-west	0.65	Average	Access denied
4	130m north	0.57	Poor	-
5	85m north-west	0.61	Average	Likely absent
6	260m west	0.61	Average	Likely absent
7	435m north-west	Filled in	-	-
8	480m north-west	0.34	Poor	-

4.57 Full presence / likely absence surveys were completed for ponds 1, 2, 5 and 6. GCN were not recorded during the pond surveys, nor were any recorded under refugia during the reptile survey. It is concluded that GCN are likely absent from the Site and adjacent areas.

4.58 Common toads are a S41 priority species. As a large breeding population of toad have previously been recorded within Pond 5, it is likely that they are present within suitable terrestrial and aquatic habitat on-Site (largely restricted to the site margins). The on-Site pond is very small, so unlikely to support significant numbers of toads, and the terrestrial habitat on-Site is of lower quality to that provided within the woodland to the north. The on-Site toad population is anticipated to be of Site importance.

Invertebrates

4.59 SxBRC provided 26 records of notable invertebrates from within the search area, including: four species of butterfly (purple emperor *Apatura iris*, swallowtail *Papilio Machaon*, grizzled skipper *Pyrgus malvae*, and white admiral *Limenitis Camilla* – the closest of the butterfly records, in the woodland to the east of site in 2008); 11 species of moth (the closest record being ten spawler moths *Asteroscopus sphinx* in the woodland to the east of site in 2007) and one true fly in 2015 (*Volucella zonaria*, which is considered rare in Sussex). SxBRC also provided six records of stag beetle *Lucanus cervus* (Habitats Directive Annex 2) from between 2002 and 2015, the closest c. 400m east-south-east of the site in 2015. A comma butterfly *Polygonia c-album* was also seen during the site visit.

4.60 The semi-improved grassland, garden and colonising ground / tall ruderal vegetation provide open flower-rich habitat for pollinators, the

small pond provides a limited amount of aquatic habitat, and the hedgerows provide flower, fruit and dead wood resources. Overall, the range of habitats and resources across the Site could support a reasonable assemblage of common invertebrates, but it is unlikely that any rare species would be present. Overall, the invertebrate assemblage of the Site is likely to be of Site value, so is not considered further in this report.

Future Baseline

- 4.61 The Site is presently under active arable management, including the periodic cutting of field margins and hedgerows. Notwithstanding the potential rotation of crop-type, these management interventions maintain the on-site conditions in a relatively stable state. There is no known intention to cease this management, other than to accommodate the proposed development should planning permission be granted. As such, the future baseline status of important ecological features is not anticipated to vary significantly from that at present.

Summary of Ecological Features

- 4.62 Table 4 below summarises all important or legally protected ecological features identified within their respective zones of influence, along with their geographic context of importance and/or protection status:

Table 4. Summary of important ecological features and their geographic context

Ecological Feature	Geographic Context of Importance and/or Protection Status
Hedgerows and trees	Local
Bats	Local to County
Badger	Protected
Dormouse	Local
Birds	Local
Reptiles	Local
Amphibians	Local

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5.0 ASSESSMENT OF EFFECTS

5.1 Outline planning permission is sought for mixed development at the Site. The following impact assessment is based on the Development Framework Plan (DFP) (CSA/3467/136) prepared by CSA Environmental on behalf of Gladman Developments.

5.2 The construction phase of the proposed development will comprise the following:

- Cessation of arable cultivation
- Demolition of existing buildings
- Removal of hedgerows H1, H4, H7 and H9, and partial loss of H3 and H5 for vehicular and pedestrian access and to facilitate construction
- Clearance of semi-improved grassland, amenity grassland, scrub, tall ruderal/colonising ground vegetation, and a pond
- Construction of up to 160 residential dwellings and an employment/commercial centre
- Construction of associated gardens, parking, access infrastructure, and two senior (110m x 70m) football pitches
- The establishment of formal and informal Public Open Space (POS) including new tree, thicket and meadow planting, as well as recreational routes
- The establishment of a woodland belt (c. 0.5ha) along the southern edge of the residential parcel, separating it from the proposed employment/commercial centre and sports hub to the south
- Construction of a Sustainable Urban Drainage System (SUDS) including a large attenuation basin set within the POS to the north-west of the developed area
- Strengthening of boundary vegetation with a significant amount (c. 0.4ha) of new native thicket planting and planting of nearly 500 new trees

5.3 The operational phase of the proposed development will comprise the following:

- Occupation of new residential dwellings and use of commercial/employment centre
- Increase in human activity, including use of vehicles and presence of domestic pets
- Increased artificial lighting and anthropogenic noise
- Management of habitats within POS

Assumptions

5.4 The following assumptions have been made during the assessment of potential effects of the proposed development on Important Ecological

Features. Although taken as part of the pre-mitigation scenario, these measures are referenced in the proceeding sections where integral to the mitigation strategy.

5.5 In accordance with BS42020:2013 (biodiversity code of practice for planning and development), it is assumed that a Construction Environmental Management Plan (CEMP) will be secured by planning condition and prepared at the detailed design stage for each phase of development. In addition to the construction phase impact avoidance and mitigation measures identified in the following sections, these will detail standard environmental control measures, including though not limited to the following:

- Implementation of strict protection measures for the root protection areas of retained trees and hedgerows, in accordance with BS5837:2012
- Standard best practice construction phase pollution prevention and control measures
- Sensitive working methods and timing to avoid direct impacts to nesting birds
- All working measures needed to comply with the terms of EPS derogation licencing specific to the development phase or works activity
- Updated ecological surveys, where necessary, to identify shifts in the baseline ecological condition (such as to support EPS derogation licence applications) in order that revised impact avoidance and mitigation measures can be adopted as required

5.6 In accordance with BS42020:2013, it is assumed that a Landscape and Ecology Management Plan (LEMP) will be secured by planning condition and submitted alongside detailed development proposals at the Reserved Matters stage. These will set out measures for the establishment and management of newly created and retained habitats.

Assessment of Likely Significant Effects

5.7 Likely effects on ecological features as a result of the proposed development have been assessed in the absence of mitigation, but take account of mitigation by design measures incorporated into the DFP. Additional measures to avoid, mitigate and compensate potential impacts are discussed within the following section of the report, and are detailed within the accompanying Ecological Mitigation and Enhancement Strategy (CSA/3467/09).

Hedgerows and trees

Predicted effects

- 5.8 The proposed development will result in the loss of hedgerows H1, H4, H7 and H9, partial loss of H3 and H5, and c. 10 trees present within the residential garden, north-east and south-east corners of the Site, a total of c. 0.4ha of habitat. However, new planting proposals include a significant number of new trees and thicket planting to buffer retained hedgerows (c. 0.4ha), and a new woodland belt along the south of the residential parcels (c. 0.5ha), which will generate an overall increase in available habitat across the site.

Mitigation

- 5.9 The majority of on-site hedgerows will be retained as part of the proposed development, as shown on the EMES plan (CSA/3467/111); this is in line with policies ENV SP1 and DM4.

Residual Effects

- 5.10 The significant amount of new buffer planting is anticipated to have a beneficial effect in terms of increasing hedgerow resources on-site, but these are not anticipated to be significant given the hedgerow loss. Overall, the proposed development is anticipated to have no significant effect on hedgerow and tree resources.

Bats

Predicted effects

- 5.11 Under the current development proposals, no trees considered to hold potential roosting opportunities for bats will be lost.
- 5.12 Current roosting by a single common pipistrelle was confirmed within B3, emerging from under a ridge tile on 06 June 2018. A roost was also identified within B4 with a soprano pipistrelle bat flying low from the north of the building on the 15 May and 06 June 2018, and seen emerging from a hole in the brickwork in section d on 12 June 2018. Buildings with confirmed and potential bat roosts have been identified within the bat emergence and return to roost survey plan (CSA/3467/122).
- 5.13 During the construction phase, foraging and commuting habitat will be lost in the east, north-east and south of the Site as hedgerows, scrub, trees, grassland and the pond are removed. This will reduce habitat connectivity from Steyne Wood to the north, through the Site to the woodland across Arundel Road to the east, and along the southern boundary. However, the POS will include a significant amount of buffer planting along the edge of Steyne Wood and the majority of the site boundaries, in addition to the new woodland belt, both of which will strengthen commuting routes. In addition, new meadow planting and a SUDs basin will provide a variety of foraging habitats.

- 5.14 During the operational phase, ambient light levels could be increased due to artificial street lighting, although it should be noted that significant flood lighting is currently in place within the industrial park.
- 5.15 In the absence of mitigation, the proposed development could have an adverse impact on bats, through roost loss / disruption of foraging habitat. However, this effect is predicted to be limited to the Site level, given the small number of minor confirmed roosts and focus of bat activity within retained habitats to the north and west.

Mitigation Measures

- 5.16 Mitigation shall be required for the loss of bat roosting opportunities within B3 and B4. Details of measures to avoid direct impacts to bats during demolition and to provide alternative roosting opportunities by way of compensation are detailed within Appendix D of the EMES. The proposed scheme includes installation of one pair of bat boxes (Schwegler 2FN, 2FN-FDP, or similar) on a retained mature tree per roost to be lost as mitigation, with additional boxes on trees and integrated into new dwellings (Habitat bat tube, or similar) by way of enhancement.
- 5.17 Demolition of B3 and B4, will need to take place under European Protected Species (EPS) licence, using methods to minimise the risk of killing or injury of roosting bats (set out within Appendix D of the EMES (CSA/3467/03)). Given the low conservation significance of the roost(s) identified, EPS licencing may be progressed by the traditional Natural England approach or via Low Impact Class Licencing (BLICL), dependent upon the survey results.
- 5.18 In line with policies ENV SP1 and DM5, to maintain habitat suitability for bats a sensitive lighting strategy will be developed to minimise light spill onto retained and new vegetation through choice of products, positioning, and use of cowl, hoods and timers. New buffer planting along the woodland edge should also help to prevent light spill from affecting the woodland interior.

Residual Effects

- 5.19 Subject to mitigation measures being successfully implemented, the proposed development is anticipated to have no significant effect on roosting or foraging bats.

Badger

Predicted Impacts

- 5.20 All badger sett tunnel entrances are located 20-30m from the construction footprint, with most tunnels dug away from the direction of the site, and will be buffered from development by the POS and new thicket planting. New meadow and amenity grassland areas will also provide foraging opportunities.

- 5.21 Badgers could experience an increased level of disturbance in the operational phase due to walkers and dogs using the site. However, the significant amount of new buffer planting should provide some screening of the sett and discourage access.
- 5.22 Overall, no significant impacts to badgers are anticipated and badgers are not considered further in this assessment. However, mitigation measures to minimise the risk of contravening legislation are set out below.

Mitigation Measures

- 5.23 As badgers are protected under the Protection of Badgers Act (1992), a pre-construction badger check will be completed to confirm the presence or likely absence of badger activity from the construction footprint, or close enough that they would be affected by the development. If any setts are found in this area, they will be closed under EPS licence.
- 5.24 Precautionary working methods during construction will be employed during construction to prevent badgers from becoming trapped in excavations, and minimise their risk of injury, to be compliant with legislation.

Dormouse

Predicted Effects

- 5.25 A significant proportion of the on-Site hedgerows will be retained and buffered by the planting of c. 0.4ha thicket planting, to be supplemented by c. 490 new trees and a new woodland belt to the south of the residential parcels (c. 0.5ha).
- 5.26 There will be loss of c. 0.4ha of scrub and hedgerows to allow creation of the primary site access, additional pedestrian access points, and facilitate the construction. This will result in a permanent loss of suitable nesting and foraging habitat (more than compensated for by new planting), and temporary reduction in habitat connectivity until new planting matures.
- 5.27 There is the potential for direct impacts to this species during the construction phase, as vegetation clearance activities may result in an offence whereby dormice are injured, killed or disturbed and/or their breeding or resting places are damaged or destroyed. During the operational phase, dormice may be at greater risk of predation due to domestic cats, and traffic collision.
- 5.28 Overall, in the absence of mitigation, the proposed development could have the potential for adverse impact on dormice significant at the Local level.

Mitigation Measures

- 5.29 Although some habitat will be lost to facilitate site access and construction, a significant amount of new buffer planting (c. 0.4ha) and a new woodland belt (c. 0.5ha) is to be included in the scheme, which will result in an overall increase in available dormouse habitat on site. The new planting will include native species of benefit to dormice, such as hazel *Corylus avellana* and blackthorn *Prunus spinosa*. Strategic placement of thorny species should also deter domestic cats. Habitat removal has been avoided where feasible, to ensure breaks in the boundary vegetation are minimised and habitat connectivity is maintained. Although the new site access will create a break in the eastern boundary and remove the majority of the southern boundary, connectivity will be maintained across the site and to the wider landscape via the western hedgerow, woodland edge to the north, and new woodland belt to be created.
- 5.30 Retained habitat will be protected against accidental damage during construction works by use of heras-style fencing or tree protection fencing as appropriate.
- 5.31 Significant areas of retained habitat will be able to accommodate a nest box scheme to provide sheltering locations whilst the new planting matures, and eventually increase availability of suitable nesting habitat. As for bats, a sensitive lighting strategy will be developed to minimise light spill onto retained and new vegetation. Appropriate management of the new buffer planting and hedgerows will ensure this new habitat maintains suitability for this species and other fauna.
- 5.32 Mitigation and development will need to be subject to an EPS licence from Natural England, which will be applied for once full planning permission has been granted, and all relevant conditions have been discharged. Habitat clearance will be subject to seasonal constraints and will adopt the recommended standard two-stage clearance methodology as recommended within the Mitigation and Compensation Methods Section of the Dormouse Conservation Handbook¹ to minimise the risk of harming dormice. Details of this can be found within the method statement in Appendix E of the EMES (CSA/3467/09).
- 5.33 The full survey results will be used to inform a Mitigation Strategy to accompany a detailed / reserved matters planning submission and any subsequent EPS licence application.

Residual Effects

- 5.34 It is considered that the scheme offers sufficient scope to ensure that impacts are avoided and that habitat compensation and enhancement measures can be delivered. Subject to a suitable Mitigation Strategy being agreed, and delivery under EPS licence, it is

considered that the proposed development has the capacity to ensure no significant effect on dormice.

Birds

Predicted Effects

- 5.35 The proposed development will result in an initial loss of nesting bird habitat through vegetation clearance and demolition of buildings, and risks killing or injuring any birds nesting during habitat clearance. New planting proposed will include a significant number of new trees, thicket planting and meadow planting. Until this new planting matures, the proposed development is anticipated to have a temporary adverse effect on nesting birds, but due to the habitat availability in the surrounding landscape this effect will not be significant.
- 5.36 During the operational phase, nesting birds will experience increased levels of disturbance due to walkers and dogs, with ground nesting / foraging species particularly affected. As the habitat currently present on Site is sub-optimal for ground nesting birds, it is unlikely this will result in a significant adverse effect.
- 5.37 In the absence of mitigation, the proposed development is anticipated to have the potential for an adverse impact on birds significant at the Site level.

Mitigation Measures

- 5.38 New planting within the POS (including woodland, tree, thicket and meadow planting, and SuDS basin creation) will provide a significant habitat resource for foraging and nesting birds; and shall provide mitigation for that removed to facilitate development. Access routes and planting in the POS will be sensitively designed with an aim to minimise disturbance of nesting birds from walkers and dogs, in line with policies ENV SP1 and DM5.
- 5.39 As all wild birds and their nests are protected under the Wildlife and Countryside Act (1981, as amended), all clearance of nesting bird habitat will be undertaken outside of nesting bird season (March to September) or immediately following a check by a suitably qualified ecologist to confirm the absence of any active nests.

Residual Effects

- 5.40 Overall, the proposed development is anticipated to have no significant effect on the bird population on site.

Reptiles

Predicted Effects

- 5.41 A very low population of common lizard is present on site (only one individual recorded). Although the proposed development will result in

a loss of some suitable habitat from the centre of the site, the majority of the boundary vegetation will be retained, and proposals include widened field boundaries with new thicket and meadow planting.

- 5.42 Habitat to be retained includes a significant proportion of the boundary hedgerows (c. 0.3ha), and grassland along the northern boundary (c. 0.1ha), so it is anticipated that sufficient opportunities for reptiles will still exist.
- 5.43 The habitat which will be removed mostly comprises semi-improved grassland (c. 2ha) which is tall, relatively uniform and of sub-optimal suitability for reptiles. In addition, a small amount of tall ruderal / colonising ground vegetation (c. 0.3 ha) and scrub and hedgerow (c. 0.4ha) will be removed. Should reptiles be present within suitable habitat to be cleared, they are at risk of killing / injury during construction works.
- 5.44 Reptiles could experience an increased level of disturbance in the operational phase due to walkers and dogs using the site, and predation from domestic cats.
- 5.45 In the absence of mitigation, the proposed development is anticipated to have potential for an adverse impact on reptiles significant at the Site level.

Mitigation Measures

- 5.46 The POS shall include new habitats of value to reptiles. The functionality of this habitat for reptile species will be maintained through appropriate management, with implementation of a low-intensity cutting regime to create a dense and tussocky sward. Meadow and thicket habitat will be enhanced for reptiles and other wildlife through creation of log piles and hibernacula to increase refuge and hibernation opportunities. In line with policies ENV SP1 and DM5, access routes and planting in the POS will be sensitively designed with an aim to minimise disturbance to reptiles from walkers and dogs.
- 5.47 To minimise the risk of killing or harming individuals, vegetation clearance will be undertaken using a two-stage approach under an ecological watching brief, which is aligned with clearance of dormouse habitat. Full details can be found within section 5 of the EMES.

Residual Effects

- 5.48 Subject to the implementation of suitable mitigation measures as appropriate, the proposed development is anticipated to have no significant effect on reptile species.

Amphibians

Predicted Effects

- 5.49 GCN are likely absent from the Site. Other amphibian species, including common toad, an S41 species, could be present on Site within suitable terrestrial habitat.
- 5.50 The proposed development will result in a loss of some habitat suitable for use by amphibians during their terrestrial life phase, and a small garden pond. There is a risk of direct impacts (killing / injury) of amphibians during habitat clearance works.
- 5.51 The new POS will include widened field boundaries which include new meadow and thicket planting, likely to be value to amphibian species, in the longer term.
- 5.52 The new SuDS attenuation basin will provide some wetland habitat (c. 0.25ha), including wet meadow grassland and marginal planting. The attenuation basin will include a permanently wet core, which will provide aquatic habitat. New aquatic habitat provision will be beneficial to amphibian species which could use the Site.
- 5.53 In the absence of mitigation, the proposed development is anticipated to have no significant adverse impact on amphibians. However, mitigation measures have been included below in line with best practice.

Mitigation Measures

- 5.54 Habitats within the POS will be managed to maximise their suitability for amphibians and other fauna, in line with legislation and policy requirements (e.g. policies ENV SP1 and DM5). This will include a low intensity cutting regime for the meadow planting, to maintain a dense and tussocky sward.

Summary of Effects

- 5.55 Table 5 below summarises the assessment of effects, including any mitigation and subsequent residual effects.

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Table 5. Summary of effects

Important Ecological Feature	Potential Likely Significant Effect and/or Legal Implication (before mitigation)	Avoidance & Mitigation Measures	Mechanism by which Mitigation is Secured	Residual Effects (after mitigation)
Hedge rows and trees	- Loss of hedge rows H1, H4, H7 and H9, and partial loss of H3 and H5 - Loss of small number of trees - New woodland, tree and buffer planting	- Retention of majority of hedge rows	Ecological Mitigation and Enhancement Strategy (EMES)	No significant effect
Bats	- Loss of minor common pipistrelle roost and minor soprano pipistrelle roost - Temporary loss of foraging habitat (until new planting matures) - Creation of SUDs basin - Increase in ambient lighting	- Mitigation to be delivered under EPS licence including provision of replacement roost locations - Sensitive lighting strategy; delivery of POS to buffer woodland to north	EMES & EPS licence	No significant effect
Badger	- Temporary loss of habitat (until new planting matures) - Risk of falling into open excavations - Increased risk of traffic collisions, disturbance	- Pre-construction badger check - Mitigation as required if should set closure be necessary - Precautionary working methods	EMES	No significant effect
Domouse	- Temporary loss of nesting/foraging habitat (until new planting matures, which will compensate) - Temporary loss of dispersal routes (until new planting matures) - Greater risk of predation from domestic cats, and traffic collision - Increase in ambient light - Strengthening of dispersal routes along N and W boundaries, and S (once new planting matures) - Significant increase in area of habitat (once new planting matures)	- Mitigation to be delivered under EPS licence, to include provision of nest boxes - New native planting including thorny species to deter predators	EMES & EPS licence	No significant effect
Birds	- Temporary loss of habitat (until new planting matures) - Increased disturbance	- Timing of clearance works - Sensitive design of POS access routes and planting to limit disturbance	EMES	No significant effect

Important Ecological Feature	Potential Likely Significant Effect and/or Legal Implication (before mitigation)	Avoidance & Mitigation Measures	Mechanism by which Mitigation is Secured	Residual Effects (after mitigation)
Reptiles	- Minor net loss of terrestrial habitat - Risk of killing/injury during construction works - Increased disturbance	- Sensitive design of POS access routes and planting to limit disturbance - Low intensity cutting regime of grassland to ensure suitable habitat long-term	EMES	No significant effect
Amphibians	- Minor net loss of terrestrial habitat - Loss of aquatic habitat (if SuDS attenuation basin can't have permanently wet core) - Risk of killing/injury during construction works - Increased disturbance	- Sensitive design of POS access routes and planting to limit disturbance - Low intensity cutting regime of grassland to ensure suitable habitat long-term	EMES	No significant effect

Cumulative Effects

- 5.56 Other nearby plans and projects that could potentially give rise to a significant cumulative effect on the ecological features identified in Table 5 above have been assessed as much as possible using publicly available information. The plans and projects and their confirmed / likely effects on ecological features are summarised in Table 6 and detailed below.

Strategic Housing Allocation in Angmering

- 5.57 Within the Arun Local Plan 2011 – 2031, the draft Policy H SP1 Strategic Housing Allocation sets out a strategic allocation for 800 homes in north Angmering and 250 homes in south and east Angmering.
- 5.58 Within the Angmering Neighbourhood Plan 2014 – 2029, policy HD2: Parish Housing Allocation sets out a strategic allocation for at least 66 dwellings on land at Bramley Green South (Mayflower Way), at least 16 dwellings on the Field in Mayflower Way, at least 20 dwellings on the Chandlers site in the centre of the village.
- 5.59 The majority of landowners within this strategic land allocation have submitted planning applications, and are currently under construction:
- A/82/12: Land to east of Roundstone Lane. Residential development comprising 138 dwellings.
 - A/144/15/PL: Land at West End Nursery. Residential development comprising 246 residential dwellings.
 - A/154/14/OUT: Pound Place, Roundstone Lane. Residential development comprising 18 dwellings.

Other Developments in Angmering

- 5.60 Other developments proposed in Angmering included in the assessment are as follows:
- A/45/19/PL: BMW House, Chandlers Garage Ltd (Undecided). Residential development comprising 19 dwellings.
 - A/46/19/PL: Land North of Mayflower Way (Undecided). Residential development comprising 24 dwellings.
 - A/9/19/PL: Pound Place Roundstone Lane (Undecided). A 62 bedroom care home.
 - A/132/17/OUT: Quiet Waters, Roundstone Lane (Undecided). Residential development comprising 30 dwellings.

- A/131/16/OUT: Land between New Place Bungalow & Arundel Road (Conditioned with S106) Residential development comprising 9 dwellings.
- A/113/15/PL: Premier Inn Spinney and Burberry House Roundstone Lane / Roundstone Road East Preston (Approved Conditionally). Commercial development comprising construction of hotel annexe.
A/178/17/OUT: Crete Nursery Dappers Lane (Undecided). Residential development comprising retention of 1 dwelling & the erection of 7 dwellings.
- A/168/18/RES & A/142/16/OUT: Merry England Nursery Dappers Lane (Conditioned with S106). Residential development comprising 18 dwellings.

- 5.61 The majority of nearby developments, both proposed and under construction, include adequate avoidance, mitigation and compensation measures to result in no significant adverse effects to IEFs. Most of the developments retain much of their boundary vegetation, with the exception of access breaks. Many of the developments, particularly the larger schemes, include significant new native planting and habitat creation which will benefit a range of wildlife.
- 5.62 No significant impacts nor potential for cumulative impacts were noted with regards to planning applications A/45/19/PL, A/9/19/PL, A/46/19/PL, A/82/12, A/132/17/OUT, A/178/17/OUT, A/142/16/OUT.
- 5.63 With regard to development at Land between New Place Bungalow & Arundel Road, potential adverse impacts in relation to dormice are predicted. Whilst no dormouse surveys were completed to inform this planning application, nor was any specific mitigation provided, dormice have now been recorded along H2, H3 and H9 which border this site. Outline proposals for the site include retention of boundary vegetation and strengthening along the roadside with native broadleaved planting. However, development at both sites will increase risk of disturbance by noise and artificial lighting, and predation of dormice by domestic cats. Overall, it is anticipated that there will be a cumulative adverse impact significant at the Site level.
- 5.64 Development at Land at West End Nursery and Premier Inn Spinney and Burberry House is anticipated to overall have a beneficial impact on a number of IEFs through ecological enhancement measures. Development at Pound Place is anticipated to have an adverse effect on nesting birds through habitat removal.
- 5.65 Cumulatively, the nearby developments in combination with the proposed development are anticipated to have a temporary adverse impact on nesting birds significant at the local level, as there will be a reduction in available nesting and foraging habitat through vegetation

clearance. This effect will be relatively short term (c. 5 years) and only last until new planting matures.

Table 6. Summary of cumulative effects

Ecological Feature	Description of Potential Residual Effects Inclusive of Mitigation (if applicable)				Geographic Scale of Cumulative Effect with Proposed Development
	A/144/15/PL	A/154/14/OUT	A/131/16/OUT	A/113/15/PL	
Hedge rows and trees	Positive impact significant at Site level	Adverse impact significant at Site level	No significant impact	No significant impact	No significant impact
Bats	Positive impact significant at Site level	Adverse impact significant at Site level	No significant impact	Positive impact significant at Site level	No significant impact
Badger	No significant impact	No significant impact	No significant impact	No significant impact	No significant impact
Dormouse	No significant impact	No significant impact	Adverse impact significant at Site level	No significant impact	Adverse impact significant at Site level
Birds	No significant impact	Adverse impact significant at Site level	No significant impact	No significant impact	Temporary adverse impact significant at local level until new planting matures
Reptiles	Positive impact significant at Site level	No significant impact	No significant impact	No significant impact	No significant impact
Amphibians	Positive impact significant at Site level	No significant impact	No significant impact	No significant impact	No significant impact

Compensation

- 5.66 To compensate for the temporary loss of bird nesting habitat until new planting matures, 10 nest boxes will be installed on retained mature trees and integrated into new buildings. A mix of nest boxes will be selected which are suitable for the species of conservation concern present locally, including swallow terraces to compensate for lost opportunities within the buildings.

Enhancement

- 5.67 The Development Framework Plan includes landscape planting enhancements which will make positive contributions to on-site biodiversity. New habitat creation will provide opportunities for species

confirmed to be present on-site at baseline, such as nesting birds. In addition to these enhancements which are embedded into development proposals, a range of additional ecological enhancement measures will be delivered as part of the proposed development, as identified below. Further details can be found in the EMES, and will be set out in full in a Landscape and Ecology Management Plan (LEMP) at the detailed design stage, however as an indicative guide:

- Inclusion of plant species of known wildlife value within the landscaping scheme, including night-scented varieties to benefit bats, and species of known benefit to dormice such as honeysuckle *Lonicera periclymenum* and hazel.
- Provision of new bat roosting opportunities: At least 15 bat boxes will be erected on mature trees or new builds. These will be a purpose-built, durable and long-lasting variety such as available from Schweigler or Habibat. Where possible, these will be incorporated into the fabric of new builds.
- Provision of new dormouse nesting opportunities: At least 20 new heavy-duty dormouse boxes will be erected on retained trees along the Site boundaries.
- Provision of new bird nesting opportunities: At least 10 bird nesting boxes will be provided in new/retained planting to benefit generalist bird species.
- Creation of log piles: Timber generated from tree clearance works at the Site will be used to make at least 5 log piles for wildlife benefit. These will be sited within boundary vegetation where they will be least disturbed. New material can be added as required following any future management works.
- Appropriate management of the POS: Both retained habitat and new planting within the ecology corridor will be managed to maximise their suitability for wildlife, to include a low-intensity cutting regime for the meadow and extended cutting intervals for hedgerows.

Monitoring

- 5.68 Ongoing monitoring of newly established and enhanced habitats as part of the POS will be completed. This commitment will be made, and further detail provided, within the LEMP to be prepared at the detailed design stage.
- 5.69 Monitoring of the bat boxes is proposed to occur in the summer of year 1 post-development, although no formal monitoring requirement is

anticipated for the EPS licence given the low conservation status of the roost(s) to be lost.

- 5.70 Monitoring of the dormouse boxes is proposed to occur in years 1 and 3 post-development, to be confirmed in the EPS licence, with monitoring checks undertaken in May, August and September each year (often the peak months). The results will be used to inform future management if necessary and will be reported to Natural England, the local records centre and any local interest groups. It is hoped that liaison with the local dormouse group can ensure that monitoring of the boxes is undertaken in the longer-term.
- 5.71 Any records of protected species will be submitted to the Sussex Biodiversity Records Centre annually, and records of bat roosts will be provided to Sussex Bat Group who will also be encouraged to continue monitoring in the longer term. These commitments will be made, and further detail provided, within the LEMP to be prepared at the detailed design stage.

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6.0 CONCLUSIONS

- 6.1 In the absence of any mitigation measures, the proposed development would be anticipated to have, at most, adverse effects significant at the Local level. However, with the implementation of some straightforward mitigation and precautionary measures as proposed with this scheme, the development is not anticipated to result in any significant adverse residual effects to important ecological features.
- 6.2 Based on successful implementation of avoidance, mitigation and enhancement measures to be informed by further survey work as set out herein, the development proposals have the scope to accord with relevant nature conservation legislation, as well as with the provisions of the Arun District Council Local Plan 2003, Draft Local Plan 2014 and Angmering Neighbourhood Plan 2014.
- 6.3 The Development Framework Plan will deliver net benefits for wild life in the form of additional habitats, with the opportunity to provide additional biodiversity enhancement measures alongside the new housing. The measures set out herein can be secured through appropriate conditions imposed upon any planning consent, and the development may therefore be delivered without harm to nature conservation interests.

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Appendix A

Habitats Plan & Photosheet

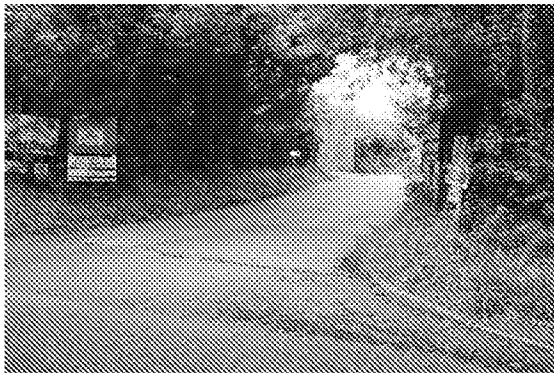


Plate 1. Site entrance from Arundel Road

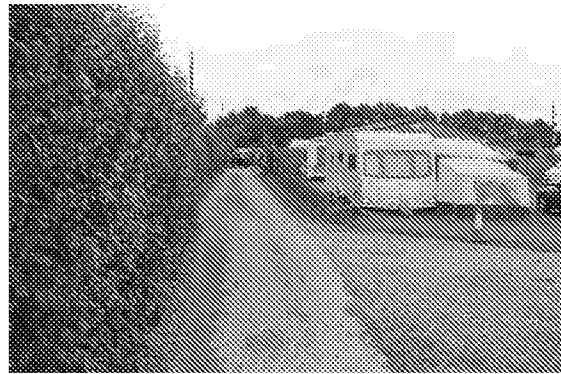


Plate 2. Caravan park with amenity grassland and hardstanding in north-east of Site



Plate 3. Pond in garden of bungalow



Plate 4. Tall ruderaland colonising ground in north-east of Site



Plate 5. Arable stubble and mature boundary vegetation



Plate 6. Arable stubble and mature boundary vegetation and scrub



Photo 7. Arable on left, semi-improved grassland and woodland edge to right



Photo 8. Mature oak tree along western boundary

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Appendix B

Legislation and Planning Policy

The Conservation of Habitats and Species Regulations 2017 (as amended) enacts the Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, and Council Directive 79/409/EEC on the Conservation of Wild Birds, into UK law. The Regulations allow for the designation of Statutory Nature Conservation-sites (SACs and SPAs) and European Protected Species ('EPS' including all UK bat species, great crested newt, hazel dormouse and otter) which are assigned a greater level of protection than under national legislation.

The Wildlife and Countryside Act 1981 (as amended) forms the primary piece of UK legislation relating to the protection of habitats and species (including nesting birds, reptiles and water vole). Additionally, badgers are protected under the Protection of Badgers Act, 1992.

Section 40(1) of the Natural Environment and Rural Communities (NERC) Act 2006 states that each public authority "must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity". This legislation makes it clear that planning authorities should consider impacts to biodiversity when determining planning applications, with particular regard to the Section 41 list of 56 habitats and 943 species of principal importance, irrespective of whether they are covered by other legislation. The S41 list was taken forward for action under the UK BAP (first published in 1994). The UK BAP has now been superseded by the Biodiversity 2020 Strategy¹, which continues to prioritise the S41 list, setting national targets for the period to 2020, and the UK Post-2010 Biodiversity Framework², which shows how these contribute to targets at the European level. Whilst BAPs are therefore no longer formally recognised, many of the tools and resources originally developed for the BAP remain in use, such as the background information which still forms the basis of work at national level.

The National Planning Policy Framework (2019) (NPPF) sets out the government planning policies for England and how they should be applied. With regards to ecology and biodiversity, Chapter 15: Conserving and Enhancing the Natural Environment, paragraph 170, states that the planning system and planning policies should minimise impacts on and provide net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

Paragraph 175 sets out the principles that local planning authorities should apply when determining planning applications:

- If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts).

¹ De fra (2011) *Biodiversity 2020: A strategy for England's wildlife and ecosystem services*. De fra, London

² JNCC and De fra (2012) *UK Post-2010 Biodiversity Framework* (on behalf of the Four Countries' Biodiversity Group). July 2012.

- Development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest.
- Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists.
- Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

The Government Circular 06/2005, which is referred to within the NPPF, defines statutory nature conservation sites and protected species as a material consideration in the planning process.

Local planning policies of relevance to ecology, biodiversity and/or nature conservation have been set out in Table B.1 below.

Table B.1. Summary of regional and local planning policy relating to ecology

Policy	Summary
Arun District Local Plan 2011-2031 (Adopted July 2018)	
Policy ENV SP1: Natural Environment	Arun District Council will encourage and promote the preservation, restoration and enhancement of biodiversity and the natural environment through the development process and particularly through policies for the protection of both designated and non-designated sites. Where possible it shall also promote the creation of new areas for habitats and species. In relation to designated sites, development will be permitted where it protects sites listed in Tables 17.1-17.7 that are recognised for the species and habitats contained within them.
Policy ENV DM1: Designated Sites of biodiversity or geological importance	a) Proposed development likely to have an adverse effect on land with the designated features of any Site of Biodiversity or Geological Importance as listed in Tables 17.1-17.7 or any subsequently designated sites (either individually or in combination with other developments), will not normally be permitted. Consideration will be given to the exact designated features present on the site, the scarcity/rarity and recognition of the protection offered by the existing status. Development on wildlife sites with the highest value will only be permitted exceptionally where the following can be demonstrated: - There is no alternative solution (which shall be adequately demonstrated by the developer). - There are reasons of public health or public safety or

Policy	Summary
	iii. There are benefits of primary importance to the environment or iv. There are imperative reasons of overriding public interest. Notwithstanding the above however, the presumption in favour of sustainable development does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined. b) In determining any planning application affecting Sites of Biodiversity or Geological Importance the Council will ensure that the intrinsic natural features of particular interest are safeguarded or enhanced having regard to; i. The European, National or Local status and designation of the site; ii. The nature and quality of the site's features, including its rarity value; iii. The extent of any adverse impacts on the notified features of interest; iv. The need for compensatory measures in order to recreate remaining features of habitats on or off the site. c) Where appropriate the Council will ensure the effective management of designated sites through the imposition of planning conditions or Section 106 agreements as appropriate.
Policy ENV DM4: Protection of trees	Development will be permitted where it can be demonstrated that trees protected by a Tree Preservation Order(s), (TPO) identified as Ancient Woodland, in a Conservation Area or contributing to local amenity, will not be damaged or destroyed now and as they reach maturity, unless development: a. Would result in the removal of one or more trees in the interests of good arboricultural practice. This shall be demonstrated by the developer following the advice of a suitably qualified person which shall be guided by BS 5837 (2012). Details of any advice received having regard to BS 5837 (2012) shall be submitted, in writing, as part of a planning application; or b. Would enhance the survival and growth prospects of other protected trees; c. The benefits of the proposed development in a particular location outweigh the loss of trees or woodland, especially ancient woodland. Where planning permission is granted in any of the above instances, conditions shall be used to ensure that, for any trees which are removed as part of a development, at least an equivalent number of a similar species and age (where practical) are planted on the proposed development site. Sufficient space for replacement trees to mature without causing future nuisance or damage shall be provided. The planting of new trees shall form an integral part of the design of any development scheme. Proper provision must be made for the protection and management of trees or areas of woodland on-site when

Policy	Summary
	undertaking development. A management plan shall be provided as part of a planning application in accordance with BS 5837 (2012) in order to ensure that trees are adequately protected during development and appropriately maintained in the future. Conditions for the continued protection of trees on sites shall be included in any planning permission given. Where there are existing trees on or adjacent to a development site, developers shall be required to provide: d. Land and tree surveys e. A tree constraints plan f. An arboricultural impact assessment to include a tree protection plan and arboricultural method statement These will ensure that development is planned to take a comprehensive view of tree issues at an early stage in the design process and that development works do not have a negative impact on existing trees.
Policy ENV DM5: Development and biodiversity	Development schemes shall, in the first instance, seek to achieve a net gain in biodiversity and protect existing habitats on site. They shall also however incorporate elements of biodiversity including green walls, roofs, bat and bird boxes as well as landscape features minimising adverse impacts on existing habitats (whether designated or not). Development schemes shall also be appropriately designed to facilitate the emergence of new habitats through the creation of links between habitat areas and open spaces. Together, these provide a network of green spaces which serve to reconnect isolated sites and facilitate species movement. Where there is evidence of a protected species on a proposed development site, planning applications shall include a detailed survey of the subject species, with details of measures to be incorporated into the development scheme to avoid loss of the species. This involves consideration of any impacts that will affect the species directly or indirectly, whether within the application site or in an area outside of the site, which may be indirectly affected by the proposals. All surveys shall be carried out at an appropriate time of year and shall be undertaken by a qualified and, where appropriate, suitably licensed person. All developments shall have regard to Natural England's standing advice for protected species.

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Appendix C

Desk Study Information

SSSI Impact Risk Zones - to assess planning applications for likely impacts on SSSIs/SACs/SP As & Ramsar sites (England)

1. DOES PLANNING PROPOSAL FALL INTO ONE OR MORE OF 2. IF YES, CHECK THE CORRESPONDING DESCRIPTION(S) BELOW. LPA SHOULD CONSULT THE CATEGORIES BELOW? NATURAL ENGLAND ON LIKELY RISKS FROM THE FOLLOWING:

All Planning Applications

Infrastructure

Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals.

Wind & Solar Energy

Minerals, Oil & Gas

Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction.

Rural Non Residential

Residential

Rural Residential

Air Pollution

Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, pig & poultry units, slurry lagoons > 200m² & manure stores > 250t).

Combustion

General combustion processes >20MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.

Waste

Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill.

Composting

Any composting proposal with more than 75000 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.

Discharges

Water Supply

Large infrastructure such as warehousing / industry where total net additional gross internal floorspace following development is 1,000m² or more.

Notes

GUIDANCE – How to use the Impact Risk Zones

[/Metadata_for_magic/SSSI IRZ User Guidance MAGIC.pdf](#)

1. DOES PLANNING PROPOSAL FALL INTO ONE OR MORE OF 2. IF YES, CHECK THE CORRESPONDING DESCRIPTION(S) BELOW. LPA SHOULD CONSULT THE CATEGORIES BELOW? NATURAL ENGLAND ON LIKELY RISKS FROM THE FOLLOWING:

All Planning Applications

Infrastructure

Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals.

Wind & Solar Energy

Wind turbines.

Minerals, Oil & Gas

Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction.

Rural Non Residential

Large non residential developments outside existing settlements/urban areas where footprint exceeds 1ha.

Residential

Residential development of 50 units or more.

Rural Residential

Any residential development of 10 or more houses outside existing settlements/urban areas.

Air Pollution

Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, pig & poultry units, slurry lagoons > 200m² & manure stores > 250t).

Combustion

General combustion processes >20MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.

Waste

Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill.

Composting

Any composting proposal with more than 75000 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.

Discharges

Any discharge of water or liquid waste of more than 5m³/day to ground (ie to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location).

Water Supply

Large infrastructure such as warehousing / industry where total net additional gross internal floorspace following development is 1,000m² or more.

Notes

GUIDANCE – How to use the Impact Risk Zones

[/Metadata_for_magic/SSSI IRZ User Guidance MAGIC.pdf](#)

1. DOES PLANNING PROPOSAL FALL INTO ONE OR MORE OF 2. IF YES, CHECK THE CORRESPONDING DESCRIPTION(S) BELOW. LPA SHOULD CONSULT THE CATEGORIES BELOW? NATURAL ENGLAND ON LIKELY RISKS FROM THE FOLLOWING:

All Planning Applications

Infrastructure

Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals.

Wind & Solar Energy

Wind turbines.

Minerals, Oil & Gas

Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction.

Rural Non Residential

Large non residential developments outside existing settlements/urban areas where footprint exceeds 1ha.

Residential

Residential development of 50 units or more.

Rural Residential

Any residential development of 10 or more houses outside existing settlements/urban areas.

Air Pollution

Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, pig & poultry units, slurry lagoons > 200m² & manure stores > 250t).

Combustion

General combustion processes >20MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.

Waste

Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill.

Composting

Any composting proposal with more than 75000 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.

Discharges

Water Supply	Large infrastructure such as warehousing / industry where total net additional gross internal floorspace following development is 1,000m² or more.
Notes	
GUIDANCE – How to use the Impact Risk Zones	/Metadata_for_magic/SSSI IRZ User Guidance MAGIC.pdf
1. DOES PLANNING PROPOSAL FALL INTO ONE OR MORE OF THE CATEGORIES BELOW?	2. IF YES, CHECK THE CORRESPONDING DESCRIPTION(S) BELOW. LPA SHOULD CONSULT NATURAL ENGLAND ON LIKELY RISKS FROM THE FOLLOWING:
All Planning Applications	
Infrastructure	Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals.
Wind & Solar Energy	
Minerals, Oil & Gas	Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction.
Rural Non Residential	Large non residential developments outside existing settlements/urban areas where footprint exceeds 1ha.
Residential	
Rural Residential	Any residential development of 100 or more houses outside existing settlements/urban areas.
Air Pollution	Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, pig & poultry units, slurry lagoons > 200m² & manure stores > 250t).
Combustion	General combustion processes >20MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.
Waste	Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill.
Composting	Any composting proposal with more than 75000 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.
Discharges	Any discharge of water or liquid waste of more than 5m³/day to ground (ie to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location).
Water Supply	Large infrastructure such as warehousing / industry where total net additional gross internal floorspace following development is 1,000m² or more.
Notes	
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Wind & Solar Energy	Wind turbines.
Minerals, Oil & Gas	Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction.
Rural Non Residential	Large non residential developments outside existing settlements/urban areas where footprint exceeds 1ha.
Residential	Residential development of 50 units or more.
Rural Residential	Any residential development of 10 or more houses outside existing settlements/urban areas.
Air Pollution	Pig & poultry units, slurry lagoons > 750m² & manure stores > 3500t.
Combustion	General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.
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General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.

Any discharge of water or liquid waste of more than 20m³/day to ground (ie to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location).

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Local Nature Reserves (England)	
No Features found	
National Nature Reserves (England)	
No Features found	
Sites of Special Scientific Interest (England)	
No Features found	

Site Check Report Report generated on Thu Oct 26 2017
You selected the location: Centroid Grid Ref: TQ065053
The following features have been found in your search area:

Ramsar Sites (England)

Name	ARUN VALLEY
Reference	UK11004
Hectares	530.42

Special Areas of Conservation (England)

Name	ARUN VALLEY
Reference	UK0030366
Hectares	487.48
Hyperlink	http://inco.defra.gov.uk/protectedsites/sacselection/sac.asp?euocode=UK0030366

Special Protection Areas (England)

Name	ARUN VALLEY
Reference	UK9020281
Hectares	530.42

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Legend

- ☒ Local Nature Reserves (England)
- ☒ National Nature Reserves (England)
- ☒ Sites of Special Scientific Interest (England)
- ☐ SSSI Impact Risk Zones - to assess planning applications for likely impacts on SSSIs/SACs/SPAs & Ramsar sites (England)

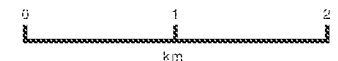
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ymin = 99150

xmax = 519100

ymax = 111700



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Legend

-  Ramsar Sites (England)
-  Special Areas of Conservation (England)
-  Special Protection Areas (England)

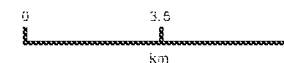
Projection = OSGB36

xmin = 459600

ymin = 82600

xmax = 557400

ymax = 128800



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Appendix D

Habitats and Flora Species List

Table D1. Indicative botanical species list for habitats present in land to the west of Arundel Road, Angmering collected during the Phase 1 habitat survey September 2017

Latin name	Common name	Garden (introduced shrub planting and amenity grassland)	Semi-improved grassland	Hard standing with colonising ground	Arable field margins	Hedge rows
Herb species						
<i>Achillea millefolium</i>	Yarrow					✓
<i>Agrimonia</i> spp.	Agrimony					✓
<i>Anagallis arvensis</i>	Scarlett pimpernel			✓		
<i>Arcium</i> spp.	Burdock sp.			✓		
<i>Argentina anserina</i>	Silverweed		✓ (east margins)	✓		
<i>Aster</i> spp.	Aster sp.			✓		
<i>Belis perennis</i>	Daivy			✓		
<i>Calystegia sepium</i>	Hedge bindweed				✓	✓
<i>Capsella bursa-pastoris</i>	Shepherd's purse			✓		
<i>Cardamine hirsuta</i>	Bittercress			✓		
<i>Centaurea nigra</i>	Common knapweed					✓
<i>Centranthus ruber</i>	Red valerian			✓		
<i>Cerastium fontanum</i>	Common mouse-ear		✓			
<i>Chenopodium</i> spp.	Goosefoot				✓	
<i>Cirsium arvense</i>	Creeping thistle		✓	✓		
<i>Cirsium</i> spp.	Thistles			✓	✓	
<i>Cirsium vulgare</i>	Spear thistle		✓	✓		
<i>Clematis</i> spp.	Clematis					✓
<i>Convolvulus arvensis</i>	Field bindweed		✓			
<i>Cruciferae</i>	Crosswort					✓
<i>Dahlia</i> spp.	Dahlia	✓				
<i>Dipsacus</i> spp.	Tesel	✓	✓	✓	✓	
<i>Epilobium</i> spp.	Willow herb			✓		
<i>Erigeron</i> spp.	Fleabane	✓	✓	✓	✓	✓
<i>Eupatorium cannabinum</i>	Hemp agrimony			✓		
<i>Euphorbia helioscopia</i>	Sun spurge				✓	
<i>Euphorbia</i> spp.	Spurge sp.			✓		
<i>Fragaria vesca</i>	Wild strawberry					✓
<i>Fumaria officinalis</i>	Fumitory				✓	
<i>Galium</i> spp.	Bedstraw					✓
<i>Geranium molle</i>	Doves foot				✓	
<i>Geranium</i> spp.	Cranebill		✓			
<i>Glechoma hederacea</i>	Ground ivy			✓		
<i>Helianthus</i> spp.	Sunflower	✓				
<i>Heraclum</i> spp.	Hogweed	✓				
<i>Hibiscus syriacus</i>	Rose of Sharon	✓				
<i>Hypericum perforatum</i>	St John's wort	✓	✓			✓
<i>Jacobaea vulgaris</i>	Ragwort		✓	✓		
<i>Lamium purpureum</i>	Red dead nettle			✓		
<i>Leucanthemum vulgare</i>	Oxeye daisy			✓		
<i>Malva neglecta</i>	Field mallow			✓		

Matricaria chamomilla	Scented mayweed			✓		
Medicago lupulina	Black medick			✓		
Myosotis spp.	Forget-me-not			✓		
Ononis repens	Rest harrow		✓			
Picris echinoides	Bristly ox tongue		✓	✓		
Plantago coronopus	Buckhorn plantain			✓		
Plantago lanceolata	Ribwort plantain			✓		
Plantago major	Greater plantain			✓		
Potentilla reptans	Creeping cinquefoil			✓		
Prunella vulgaris	Selfheal	✓		✓		
Pteridium spp.	Bracken					✓
Ranunculus spp.	Buttercup	✓	✓			
Rumex spp.	Dock	✓	✓	✓	✓	
Solanaceae spp.	Nightshade sp.			✓		
Sonchus spp.	Sow thistles			✓		
Stachys sylvatica	Hedge woundwort		✓ (margins)			
Stellaria holostea	Greater stitchwort					✓
Taraxacum spp.	Dandelion			✓		
Tielfium repens	White clover		✓	✓		
Tielfium spp.	Clover		✓	✓	✓	
Tripleurospermum inodorum	Scentless mayweed			✓		
Urtica spp.	Nettle		✓	✓	✓	
-	Various ornamental shrubs	✓				
Vicia cracca	Tufted vetch		✓			
Grasses, rushes and sedges						
Bromus hordeaceus	Soft-brome		✓			
Dactylis glomerata	Cock's-foot		✓		✓	✓
Festuca rubra	Red fescue	✓				
Holcus lanatus	Yorkshire fog		✓	✓		
Lolium perenne	Perennial rye grass	✓	✓	✓		
Phleum pratense	Timothy		✓			
Poa annua	Annual meadow-grass	✓		✓		
Arrhenatherum elatius	False oat grass					✓
Brachypodium sylvaticum	False brome					✓
Juncus inflexus	Hard rush					✓
Woody species						
Acer campestre	Field maple					✓
Acer pseudoplatanus	Sycamore					✓
Aesculus hippocastanum	Horse chestnut					✓
Alnus glutinosa	Common Alder					✓
Buddleja spp.	Buddleia	✓				
Buddleja spp.	Buddleia					✓
Clematis vitalba	Traveler's joy					✓
Comus spp.	Dogwood	✓				
Corylus avellana	Hazel					✓

Cotoneaster spp.	Cotoneaster					✓
Crataegus monogyna	Hawthorn					✓
Cupressus × leylandii	Leylandii					✓
Euonymus europaeus	Spindle					✓
Fagus sylvatica	Beech					✓
Fraxinus excelsior	Ash			✓		✓
Hedera spp.	Ivy					✓
Ligustrum vulgare	Wild privet					✓
Malus spp.	Apple tree	✓				
Populus spp.	Poplar spp.					✓
Populus tremula	Aspen					✓
Prunus avium	Cherry					✓
Prunus spinosa	Blackthorn					✓
Prunus spp.	Prunus (domesticated)	✓				✓
Quercus spp.	Oak spp.					✓
Rosa arvensis	Field rose					✓
Rosa canina spp.	Dog rose					✓
Rubus fruticosus agg.	Bramble					✓
Salix spp.	Willow					✓
Sambucus nigra	Elder					✓
Tilia platyphyllos	Large-leaved lime					✓
Ulmus spp.	Elm					✓

Table D2. Indicative botanical species list for hedgerows present in land to the west of Arundel Road, Angmering collected during the Phase 1 habitat survey September 2017

Hedgerow Number		H1	H2	H3	H4	H5	H6	H7	H8	H9
Common name	Latin name	Managed garden hedge	Mature c.4m tall	Mature c.4m tall	Mature c.5m tall	Tall tree belt	Wide & scrubby, outgrown with mature trees	Dense c.5m tall	Dense, mature, c.5m tall	Dense, outgrown, c.4m tall
Woody species										
Acer campestre	Field maple				✓	✓				
Acer pseudoplatanus	Sycamore									
Aesculus hippocastanum	Horse chestnut									
Alnus glutinosa	Common Alder					✓				
Buddleja spp.	Buddleia									✓
Clematis vitalba	Traveler's joy						✓			
Corylus avellana	Hazel								✓	
Crataegus monogyna	Hawthorn		✓	✓	✓		✓		✓	
Cupressus × leylandii	Leylandii		✓ (dominant to north)							
Euonymus europaeus	Spindle			✓						
Fagus sylvatica	Beech	✓	✓							
Fraxinus excelsior	Ash		✓	✓		✓ (dominant)				
Hedera spp.	Ivy	✓		✓	✓	✓			✓	

Ligustrum vulgare	Wild privet			✓						
Populus sp.	Poplar spp.					✓				
Populus tremula	Aspen					✓				
Prunus avium	Cherry					✓				
Prunus spinosa	Blackthorn		✓	✓			✓ (dominant)	✓	✓	✓
Prunus spp.	Prunus (domesticated)				✓					
Quercus sp.	Oak sp.					✓	✓			
Rosa arvensis	Field rose			✓						
Rosa canina spp.	Dog rose		✓		✓		✓			
Rubus fruticosus agg.	Bramble	✓	✓							
Salix spp.	Willow (saplings)				✓		✓			✓
Sambucus nigra	Elder	✓				✓			✓	✓
Tilia platyphyllos	Large-leaved lime					✓				
Ulmus sp.	Elm			✓	✓		✓		✓	✓
Cotoneaster sp.	Cotoneaster	✓								
Herb species										
Achillea millefolium	Yarrow			✓						
Agrimonia sp.	Agrimony			✓						
Calystegia sepium	Hedge bindweed									✓
Centaurea nigra	Common knapsweed			✓						
Clematis sp.	Clematis			✓						

Cruc i a t a l a e v i p e s	Crosswort			✓						
Erige ron sp .	Fle a b a n e			✓						
Fra g a r i a v e s c a	Wild stra w b e r r y			✓						
G a l i u m sp .	Be d s t r a w			✓						
Hype ric um pe r f o r a t u m	St John's wort			✓						
Pte rid i u m sp .	Bra c k e n			✓						
Ste l l a r i a h o l o s t e a	Gre a t e r s t i t c h w o r t			✓						
Gra s s e s , r u s h e s a n d s e d g e s										
Arrhe na the rum e l a t i u s	Fa l s e o a t g r a s s			✓						
Bra c h y p o d i u m s y l v a t i c u m	Fa l s e b r o m e			✓						
Da c t y l i s g l o m e r a t a	C o c k ' s - f o o t			✓						
Junc us in fle x u s	Ha rd r u s h									

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Appendix E

Evaluation & Assessment Methods

Ecological features are evaluated and assessed with due consideration for the Chartered Institute of Ecology and Environmental Management (CIEEM) 2018 Guidelines for Ecological Impact Assessment (EcIA). For clarity, the evaluation and assessment process adopted within this EcIA is set out below.

Establishing Potentially Important Ecological Features

Ecological features are assessed where they are considered to be important, and where they may be impacted by a proposed development. A feature may be considered important for a variety of reasons, such as quality, extent, rarity and/or statutory protection. Table E.1 below sets out a non-exhaustive list of ecological features that are typically considered, along with key examples:

Table E.1. Potentially important ecological features (adapted from CIEEM 2018)

Potentially Important Ecological Features	Typical examples
Statutory designated sites under international conventions or European Legislation	Wetlands of International Importance (Ramsar sites), Special Areas of Conservation (SAC), Special Protection Areas (SPA)
Statutory designated sites under national legislation	Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature Reserves (LNR)
Non-statutory, locally designated wildlife sites	Local Wildlife Sites (LWS), County Wildlife Sites (CWSs), Sites of Importance for Nature Conservation (SINCs)
National biodiversity lists	Habitats or Species of Principal Importance for the Conservation of Biodiversity (Section 41, NERC Act 2006), Ancient Woodland Inventory
Local biodiversity lists	Local Biodiversity Action Plan (BAP) priority species or habitats
Red Listed / Rare Species	Species of conservation concern, Red Data Book (RDB) species, Birds of Conservation Concern, nationally rare and nationally scarce species
Legally Protected Species	E.g. species listed under Sch.5 of the W&C Act 1981, or Sch.2 of the Hag. Regs. 2017
Legally Controlled Species	E.g. species listed under Sch.9 of the W&C Act 1981

It should also be noted that the social, community, economic or multi-functional importance attributed to ecological features are not assessed as they fall outwith the scope of this assessment.

Establishing Likely Zone of Influence

The 'zone of influence' for a project is the area over which ecological features may be subject to significant effects as a result of the project and associated activities. The project's zone of influence varies across different ecological features, which have different vulnerabilities and sensitivities. For the purposes of this assessment, the following zones were considered:

- International statutory nature conservation designations up to 10km from the Site
- National and local statutory nature conservation designations up to 3km from the Site
- Non-statutory locally designated wildlife sites up to 1km from the Site

These arbitrary distances are considered sufficient for identifying the nature conservation designations which could be subject to significant effects. However, it is acknowledged that in certain circumstances effects beyond these distances are possible and should be considered as far as is reasonably practicable to do so.

For other ecological features, such as habitats and species, the appropriate zone of influence is described and justified as appropriate within the report, depending on their respective sensitivity to an environmental change.

The results of professionally accredited or published scientific studies have been used and referenced, where available, to establish the spatial and temporal limits of the biophysical changes likely to be caused by specific activities, and to justify decisions about the zone of influence.

Geographic Context and Significance Criteria

The importance of ecological features, as well as the significance of any likely impacts and their effects, are considered here within a defined geographic context:

- International
- National
- Regional
- County
- Local

The size, conservation status and the quality of features are all relevant in determining their importance and assigning this to the geographic scale. Where the importance of a feature is considered to fall below the Local scale, they are scoped out of detailed assessment.

Impacts and their effects are taken to be significant where they support or undermine biodiversity conservation objectives, with the scale of significance defined according to the above geographic context. Where

an impact or effect is unlikely to be perceptible at a Local scale, this is taken to be not significant.

Characterising Ecological Impacts and their Effects

Where likely significant ecological impacts and effects are identified in connection with the proposed project, these are considered and described with reference to the following characteristics (where this is helpful in accurately portraying the ecological effect and determining the scale of significance):

- Positive or negative (i.e. does the anticipated change accord with nature conservation policies and objectives?)
- Extent (i.e. the spatial area over which the impact or effect may occur)
- Magnitude (i.e. the quantified size, amount, intensity or volume)
- Duration (i.e. the time frame over which the impact or effect may occur, in both human and ecological terms)
- Frequency and timing (i.e. the number of times an activity occurs, where this is likely to influence the effect)
- Reversibility (i.e. is spontaneous recovery possible or may the effect be counteracted by mitigation?)

Appendix F

Bat survey report

Building inspection photosheet

Bat activity transect survey routes plan (CSA/3467/109)

Bat habitat utilisation plan (CSA/3467/110)

Bat building survey plan (CSA/3467/122)

Introduction

Survey design, data analysis and interpretation set out herein has been undertaken with due consideration for the Bat Conservation Trust (BCT) guidelines 3rd Edition (BCT, 2016).

Legislation

All species of British bats are legally protected under part 3 (Section 41) of the Conservation of Habitats and Species Regulations 2017. These Regulations make it an offence to:

- Deliberately capture, injure, or kill a bat;
- Deliberately disturb bats, impairing their ability to survive, breed, reproduce or rear/nurture their young;
- Damage or destroy a breeding site or resting place used by bats; or
- Be in possession of, transport, sell, exchange or offer to sell/exchange a bat (dead or alive) or any part of a bat.

All bats and their roosts in England, Scotland and Wales were originally protected under the Wildlife & Countryside Act 1981. Subsequent amendments to the legislation for England and Wales has removed bats from most of the provisions of the Act, however it remains an offence to:

- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection; or
- Intentionally or recklessly obstruct access to any structure or place that a bat uses for shelter or protection.

Disturbance of bats is covered by both the 2010 Regulations and the 1981 Act, with the magnitude of disturbance critical. Disturbance that impairs survival or successful reproduction would be covered by the Regulations with no legal defence existing. Less significant acts of disturbance may only be covered by the Wildlife & Countryside Act 1981, which includes some legal defences that may be applied in certain circumstances.

It is important to note that bat roosts are protected throughout the year, regardless of whether or not bats are present at the time. Under the Conservation of Habitats and Species Regulations the offence of damaging or destroying a breeding site or resting place of bats is not subject to any legal defence, i.e. an offence will have been committed even if the damage or destruction occurs accidentally.

Licensing

Where development is proposed that would result in an offence under the Habitats and Species Regulations a European Protected Species (EPS) licence needs to be granted by Natural England to permit an act that would otherwise be unlawful. This provides for a specific derogation from the legislation, to prevent a legal infringement occurring. To obtain an EPS

licence for development it must be demonstrated that the purpose of the act to be licensed is for:

“preserving public health or public safety or other imperative reasons of overriding public interest including those of social or economic nature and beneficial consequences of primary importance for the environment” (Regulation 53(2)(e)).

In addition Natural England will not grant an EPS licence unless they are satisfied that:

*“There is no satisfactory alternative” (Regulation 53(9)(a)); and
“The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range” (Regulation 53(9)(b)).*

Methods

Preliminary Roost Assessment

The aim of the preliminary roost assessment is completed to determine the suitability of the building for roosting bats. Where significant potential for, or evidence of, roosting bats is identified, further bat roost surveys are generally necessary to determine the presence or likely absence of a roost, and to characterise any roost present. The method described below has been followed with due consideration of the current guidelines (BCT, 2016).

A detailed inspection of the exterior of structures at the Site was undertaken to (i) identify any Potential Roost Features (PRFs) and potential bat ingress / egress points, and (ii) locate any evidence of bats such as live or dead specimens, droppings, urine splashes, fur-oil staining, feeding remains (e.g. moth wings) and/or squeaking noises. Internal inspections were also undertaken for buildings B1, B2, B7, B8, B9 and B13, which were scoped in due to suitable features noted during the external inspections. Equipment used included ladders, high-powered torches and close-focusing binoculars, as appropriate. The external inspection of the on-site structures and internal inspection of B1 was carried out by Clare Caudwell ACIEEM (2015-15070-CLS-CLS) and Jessica Taft GradCIEEM on 06 September 2017. The external and internal inspection of B2, B8 and B13 was carried out by Tilly Fitzwebster (2017-31876-CLS-CLS) and Jessica Taft on 13 March 2018.

Evaluation

Following the assessments, each structure was assigned one of the following categories in respect of its potential to support roosting bats (adapted from Collins, 2016):

- Negligible: no obvious PRFs
- Low: a structure with one or more PRFs that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions

and/or suitable surrounding habitat to be used on a regular basis by large numbers of bats.

- Moderate – a structure with one or more PRFs 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.
- High – a structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

Dusk Emergence Survey

During the survey, surveyors were positioned strategically to maximise their visual coverage of the building. Emergence surveys began c. 15 minutes before British Summer Time (BST) sunset and continued for approximately 1.5 hours after sunset with due consideration for the BCT good practice guidelines. The survey work was led by Jessica Tait GradCIEEM, an experienced bat surveyor. The survey was undertaken in suitable weather conditions (see Table 1 below).

Table F.1 Weather conditions during emergence survey, 20 September 2017

Survey Date	Buildings Surveyed	Sunset/ Sunrise	Start Time	End Time	Temperature (°C)		Precipitation	Cloud Cover (Okta's)		Wind (Beaufort Scale)	
					Min	Max		Min	Max	Min	Max
20/09/17	1	19:04	19:04	20:34	15	15	Dry	46	46	23	23
01/05/18	8, 9	20:22	20:03	21:45	12	11	Dry	8	4	2	1
09/05/18	8, 9	20:35	20:30	22:00	14	12	Dry	8	8	2	2
14/05/18	13, 15, 16	20:43	20:45	22:13	18	15	Dry	4	2	1	1
15/05/18	2, 3, 4	05:13	03:45	05:13	13	12	Dry	0	0	5	4
06/06/18	2, 3, 4	21:11	20:41	22:41	22	17	Dry	2	3	0	1
07/06/18	1, 13	04:50	03:25	04:50	19	15	Dry	8	8	2	1
12/06/18	3, 4	21:16	21:01	22:46	16	19	Dry	0	6	0	0

During the survey, the surveyors, each equipped with a hand-held Wildlife Acoustics EM3 bat detector or Eikon BatLogger M, watched for any bats emerging from/entering parts of the buildings/trees and using key flight lines. A note was made of all bat passes, along with the time, species and any information regarding behaviour, including direction of flight, and activity e.g. foraging/commuting. As it was hard to access/ view the narrow alley between buildings B3 and B4, a Wildlife Acoustics SM2 bat detector was affixed to an infrared camera rig to record footage of any bats and their calls and thereby assist with identifying the species of any bats filmed emerging from/returning to roost in this area.

Following the survey all bat calls were downloaded from the EM3 detectors and BatLoggers and analysed using AnalookW v.4.1z and BatExplorer

Software, respectively, to enable species identification, where possible, and quantitative analysis of the data.

Remote Monitoring

Remote monitoring was undertaken to provide additional data to inform the assessment of bat activity across the Site. The extended time period covered by this type of survey allows for a more accurate assessment of bat species diversity and activity levels to be made.

Two Wildlife Acoustics Songmeter (SM2/SM2+) static detectors were deployed on three occasions during early and late September 2017, and May 2018 to provide six data-sets. The locations of each Monitoring Point (MP) are shown in Figure F.1 below. MP4 was installed at the entrance to B13, a dilapidated out-building. Whilst this building was not considered to be provide good opportunities for use as a day roost, bat activity at the barn entrance was monitored to provide any indication of use as a night roost / feeding perch. In June 2018, a static detector was again deployed inside B13 for 4 nights.

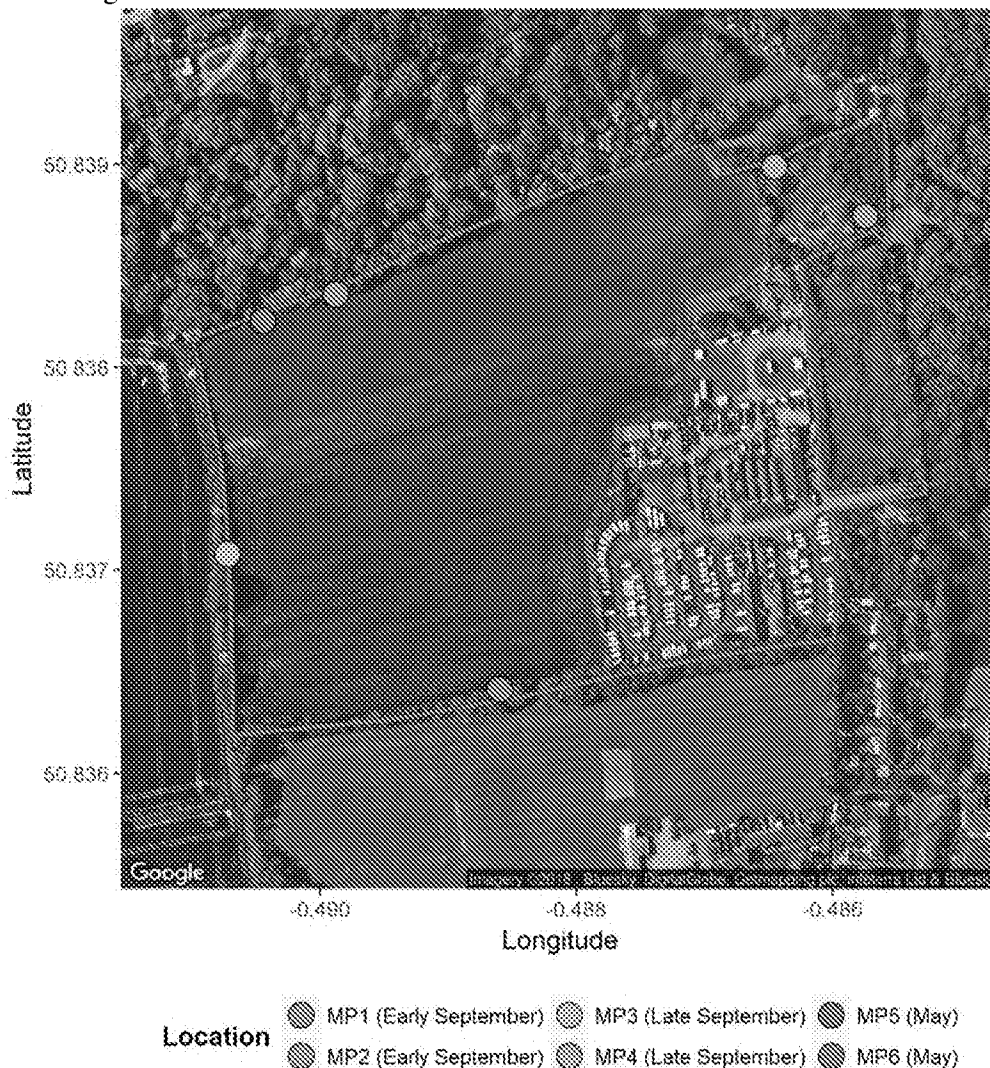


Figure F.1 Map to show the locations of each Monitoring Point (MP) surveyed during static monitoring surveys in September

The detectors were installed on-site and setup to record bat activity automatically for the period from half an hour before sunset until half an hour after sunrise each night. Each monitoring period spanned at least five consecutive nights.

Weather conditions were obtained for each night surveyed using historic weather data from the World Weather Online website, with weather observations taken from the nearest weather station in Shoreham Airport. The five nights showing the most optimal weather conditions (in terms of temperature, precipitation and wind speed) were taken forward for analysis.

Recorded bat calls were analysed using the specialist software AnaLookW to identify the species present. Each recorded file is considered to represent a single bat 'pass'. Quantitative analysis of bat activity levels is then undertaken by calculating the mean number of bat passes per hour.

Static data analysis and graphics were also produced in the statistical computing and graphics software R and this report has been written and generated using the authoring format R Markdown through R-Studio.

Bat Activity Transect Survey

Transect surveys were undertaken at the Site in September 2017, May and June 2018 to assess the level and distribution of bat activity across on-site habitats. Two transect routes were walked on each occasion which covered different areas of the Site at random. Several circuits of the survey area could be made during each survey, each of which was altered at random to visit different habitat types or features. Effort was made to ensure that all parts of the Site were visited and thus represented during subsequent analysis, in order to give the truest possible reflection of bat activity. Each transect was walked at a moderate and consistent speed with bat activity and observations of bat behaviour recorded during the survey. Each transect survey commenced at sunset (British Summer Time), continuing for the following two hours and was undertaken during suitable weather conditions as summarised in Table F.1.

Bat calls were recorded using Eikon Batlogger M detectors, with recordings later analysed using BatExplorer software to identify each bat call to species or genus level. Batlogger M detectors automatically record each time an ultrasound signal is detected with a one second delay between recordings. Each of these automatically recorded sound files, which contain a variable number of call pulses, is designated as a 'bat contact' and then manually assigned a species identification, where possible. At the point of contact, each sound file is assigned a GPS location.

Bat data analysis and graphics have been produced in the statistical computing and graphics software R and this report has been written and generated using the authoring format R Markdown through R-Studio.

The transect survey design, data analysis and interpretation takes account of the Bat Conservation Trust (BCT) guidelines 3rd Edition (Collins, 2016).

Limitations

Due to access constraints, it was not possible to complete an internal inspection of B8. Some parts of B2, B4 and B9 also could not be accessed, either because the loft access had been closed up (B2, B9) or due to volume of storage (B4), however a partial internal inspection was possible. Any information on the building interiors which could be collected during the external inspection has been recorded.

Batlogger M detectors automatically assign a GPS location to each bat contact, allowing distribution maps to be plotted (see Results section of this report). The accuracy of the GPS locations provided for each contact is variable and may depend on the number of satellites available and the strength of the signal received. This in turn is affected by environmental conditions such as cloud or tree canopy cover. The accuracy of GPS coordinates may vary between 5-15m during a transect survey and, as a result, this must be taken into account when viewing the distribution maps within this report.

It should be noted that the findings described herein for static monitoring surveys are based on the bat activity recorded at the location immediate to each static detector, and therefore only describe localised activity at the Site. Detectors were moved around the Site between monitoring periods to sample different areas and reduce the effect of this limitation, however caution should be used when applying results to the wider area.

A fifth static detector was deployed for the second monitoring period along the southern Site boundary to increase coverage. Unfortunately due to microphone issues, it did not record properly. No static recording data is therefore available for this part of the site, although it was covered during the transect surveys undertaken.

Results

Preliminary Roost Assessment

Results of the assessment are detailed in Table F.2 and summarised below. Photos can be found in the photosheet to the rear.

Of the eleven buildings surveyed, one building has high potential to support roosting bats (B1), six have moderate potential (B2, B3, B4, B8, B9, B13), with the remainder having negligible potential.

B1 was inspected both internally and externally. The external inspection revealed a number of features suitable for use by roosting bats, including lifted tiles, missing mortar and a missing brick. The internal inspection found the loft void was generally well sealed, in regular use, and very clean, with no signs of roosting bats. Although roosting bats are likely absent from the loft void, the external features noted are suitable for crevice-dwelling species of bat, such as pipistrelle species *Pipistrellus* sp.

B2, B3, B4 and B8 have external features suitable for roosting bats, including gaps beneath weatherboarding, in mortar and under corrugated roofing.

B9 has a loft void with numerous access points, and is adjacent to a tree line. Internal features were present which could be suitable for both crevice-dwelling and hanging species, such as brown long-eared *Plecotus auritus*.

B13 is derelict and open, so easily accessible to bats. Some internal features suitable for crevice-dwelling species were noted. Due to its openness it is unlikely to be suitable as a day roost for hanging species, but as it is close to woodland where high bat activity was recorded in 2017, it is likely this building is used as a night roost (feeding perch).

Table F.2 Results of Building Inspection Survey

Building Ref.	Building Description	External features/ evidence	Internal features/ evidence	Bat roost potential
B1	Residential bungalow in current use. Constructed in 1960s with a hipped roof and wooden soffit box. Flat roofed sections with bitumen felt on top of bay windows and small extension to north on western side, and south on eastern side.	On most faces there is a gap under the roof tiles c. 2 tiles down from the ridge. Under a line of lifted tiles below the ridge on the eastern side there is visibly less moss cover beneath. Missing mortar under hip tiles on south-eastern corner and north-western corner. Gaps under roof tiles around the chimney on the western side. Some lifted tiles around window and in valley near window. Missing brick at the top of the wall on the western side.	Rough sawn timber beams with purlin. Open loft void with no trusses. Loft is generally well sealed and has recently been re-insulated, and is in regular use. The roof liner laps over the top of the ridge beam, forming a seal. There are two tears in the bitumen roof liner in the south-east section of the roof which provide access to the tiles and space under the ridge beam. The section with the window is very bright, but elsewhere is dark. Good ventilation gaps to soffit. No signs of droppings, feeding debris or urine signs.	High
B2	Breeze block construction with corrugated asbestos pitched roof. The building is split into two sections, a two storey section to the north (B2a) and a single storey section to the south (B2b).	Gap at apex of B2a at northern end. Gap under metal cladding and asbestos insulation along wall between B2a and B2b. Gaps at ridge and under subsided sections of roof on B2b (tenant noted hornets' nest is present and active in summer). Opportunities for crevice-dwelling bats in gaps under corrugated roofing material, in brickwork and at top of wall under roof.	Within B2a, roof is boarded underneath, with no loft void. Gaps between asbestos and internal sarking boards. Within B2b is a fibreglass sealed space which used to be used previously to grow mushrooms. Unlikely to be suitable for bats.	Moderate
B3	Two storey building of brick construction with corrugated asbestos pitched roof.	Gappy plastic weatherboarding on the eastern side, and gappy metal flashing on the western side with large gaps at the top of the wall beneath the roof. Crack in mortar on western end. Gaps under corrugated roofing on both north and south sides, some of which are cobwebbed. Extension linking B3 and B4 has very gappy plastic weatherboarding.	Roof is boarded underneath, with no loft void.	Moderate
B4	Single storey building comprised of five adjacent round-roofed sections (B4a-e west to east) of brick	Numerous gaps behind weatherboarding, in mortar and at tops of walls / doors. Bricked up windows and doors on B4c and B4d with a 9 inch wide gap at the top across the length of	No loft void, building is open to corrugated roof. Some units are actively used for workshop space (B4a, b) and office space (B4e). Some units are used	Moderate

Building Ref.	Building Description	External features/ evidence	Internal features/ evidence	Bat roost potential
	construction with single-skinned corrugated asbestos roof. B4a and b are in use as workshops. B4e linked to B3 by conservatory.	the window; the void leads up to the roof. Dropping found on ledge of B4c beneath gap, the morphology and composition of which indicated it was from a bat. Gaps between the brickwork and corrugated asbestos roofing in the south-east corner of B4e. Some holes in corrugated bitumen roof leading to space underneath.	for storage (B4c, d) and are rarely disturbed; direct access was not possible to these sections. Disused sections could be suitable for bats if access to interior is possible.	
B5	Single storey building of brick construction with corrugated asbestos pitched roof.	Small gaps at apex and where roof panelling overlaps, but expandable foam can be seen at eaves.	N/A	Negligible
B6	Single storey building with corrugated metal cladding and corrugated asbestos pitched roof.	No internal roof lining, so temperature of building is likely to fluctuate a lot, making it unsuitable for roosting bats.	N/A	Negligible
B7	Single storey building of breeze block construction with corrugated asbestos pitched roof.	Building was open, so bats could enter through the doorway.	Half the roof is unlined, and half is lined in blue plastic. Some gaps are visible around the rotten rafters, but no evidence of roosting bats was seen.	Negligible
B8	L-shaped lean-to / shack with concrete walls, a half-pitched corrugated metal roof and awning to the south. Lots of dense ivy and ash tree growing on south-west side of building in corner of "L".	Gap between metal and bitumen liner draped over rafters c. 4 inches wide. No features for bats to hang off, but suitable for crevice-dwellers.	N/A – access not possible	Moderate
B9	Single storey building of breeze block construction with corrugated asbestos pitched roof.	Gaps under eaves all along sides of building.	Timber A-frame roof with timber beams on top of dividing walls, unlined. Access only possible to southern section as no loft hatches or access through dividing walls. Gaps along ridge line and eaves throughout, gaps through dividing walls around beams. Lots of ash seeds, mouse droppings and cobwebs, which could obscure bat droppings.	Moderate

Building Ref.	Building Description	External features/ evidence	Internal features/ evidence	Bat roost potential
B10	Small single storey service building of breeze block construction with a corrugated asbestos roof.	Well sealed with no apparent gaps or potential roosting features.	N/A	Negligible
B11	Single storey, flat roofed storage containers / site office	N/A	N/A	Negligible
B12	Single storey, flat roofed storage containers / site office	N/A	N/A	Negligible
B13	Dilapidated single storey barn. Roof has partially collapsed and completely covered with dense ivy.	Open doors and partially bricked-up windows provide access points. No external features offering roosting opportunities noted.	No enclosed roof space, corrugated asbestos resting on supporting beams. Beams covered with encroaching ivy. Missing bricks in south-west provide access into cavity wall. Gap around wooden door frame c. 1 inch wide. Gaps between beams and roof for crevice-dwellers, or beams for hanging-species. Interior of building open and quite exposed.	Moderate
B14	Brick out-building; mostly collapsed – roof no longer present.	None identified.	None identified.	Negligible
B15	Small single storey brick garage with flat roof with corrugated asbestos.	Well sealed with no apparent gaps or potential roosting features.	N/A	Negligible
B16	Glass greenhouse.	N/A	N/A	Negligible
B17	Campsite toilet block	N/A	N/A	Negligible

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Dusk Emergence / Dawn Return to Roost Surveys

Summary of roosting activity

Current roosting by a single common pipistrelle was confirmed within B3, emerging from under a ridge tile on 06 June 2018. A roost was also identified within B4 with a soprano pipistrelle bat flying low from the north of the building on the 15 May and 06 June 2018, and seen emerging from a hole in the brickwork in section d on 12 June 2018. Buildings with confirmed and potential bat roosts have been identified within the bat emergence and return to roost survey plan (CSA/3467/122).

General bat activity

At least six species of bat were noted within the survey locality during the 2017/2018 surveys, including common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, Nathusius' pipistrelle *Pipistrellus nathusii*, Myotis species, noctule *Nyctalus noctula* and brown long-eared *Plecotus auritus*. The majority of activity was attributed to common pipistrelle bats, with low numbers of common pipistrelle bats identified foraging around the hedgerows associated with the buildings. Low numbers of noctule and soprano pipistrelle were recorded passing over the site, with passes from Nathusius' pipistrelle and Myotis recorded on occasion.

Transect Survey Results

The dates and weather conditions for each transect survey are provided in Table F.3 below.

Table F.3 Bat transect survey weather conditions

Survey Date	Sunset/ Sunrise Time	Start Time	End Time	Temperature (°C)		Precipitation	Cloud Cover (Okta's)		Wind (Beaufort Scale)	
				Start	End		Start	End	Start	End
06/09/17	19:37	19:33	21:37	14	15	Dry	0	1	0	1
09/05/18	20:46	20:46	22:46	12	13	Dry	4	8	1	2
06/06/18	21:11	21:05	23:11	18	20	Dry	5	7	1	1

At least eight species of bat were recorded at the site during the transect surveys, comprising common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, Nathusius' pipistrelle *Pipistrellus nathusii*, *Pipistrellus* species, noctule *Nyctalus noctula*, *Nyctalus* species, serotine *Eptesicus serotinus*, big bat species, Myotis species, brown long-eared *Plecotus auritus*, barbastelle *Barbastella barbastellus* and bat species. The number of bat contacts recorded for each species are summarised in Table F.4 below. The locations of each bat contact and the overall distribution of activity across the Site are illustrated in Figures F.2 and F.3.

Bat activity was predominantly recorded along the Site boundaries, in particular the northern and western boundaries, and was dominated by common and soprano pipistrelle calls. Some calls from Myotis species, noctule, pipistrelle species, serotine, brown long-eared and barbastelle were also recorded. Fewer calls were recorded along the southern Site boundary and around the commercial buildings, although there was activity recorded around the bungalow and garden. The greatest amount of bat activity was recorded along the northern and western Site boundaries. Barbastelle, brown long-eared and noctule were only recorded here, and the majority of soprano pipistrelle were recorded here. The northern Site boundary comprises the edge of a parcel of woodland which extends north and includes a stream. Serotine were recorded in the more open habitats in the east and west of the Site, and a single Nathusius' pipistrelle was recorded in the arable field. Common pipistrelle calls were relatively ubiquitous around the Site boundaries.

Table F4. Summary of bat contacts recorded during the transect surveys

Month	Barbastelle	Bat Sp	Big Bat	Brown long-eared	Common pipistrelle	Myotis species	Nathusius' pipistrelle	Noctule	Pipistrellus species	Serotine	Soprano pipistrelle
May	5	1	4	4	190	0	0	19	3	3	6
June	0	0	0	0	42	2	1	4	1	5	17
September	1	0	0	1	129	39	0	12	1	1	87

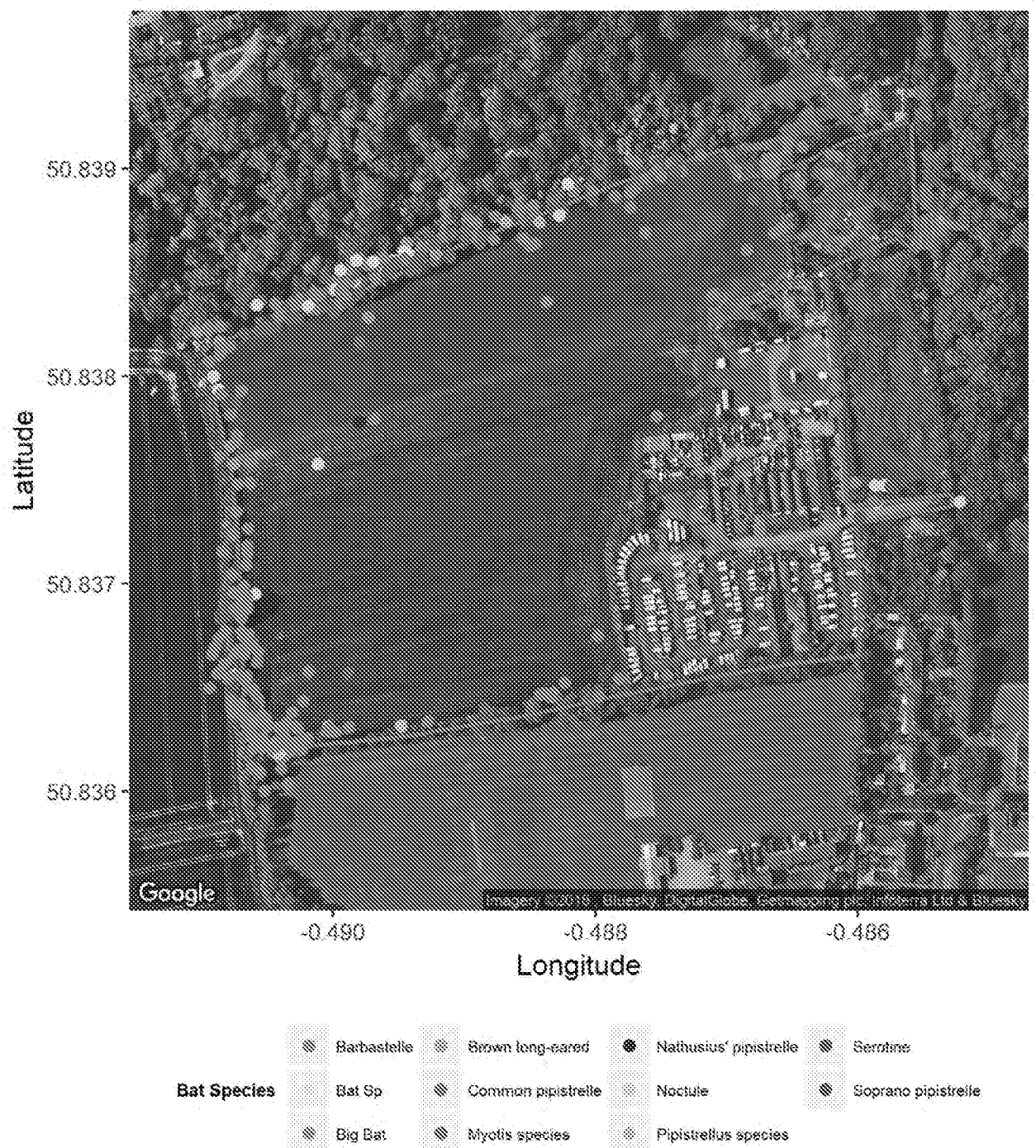


Figure F.2. The locations of individual bat contacts recorded during transect surveys

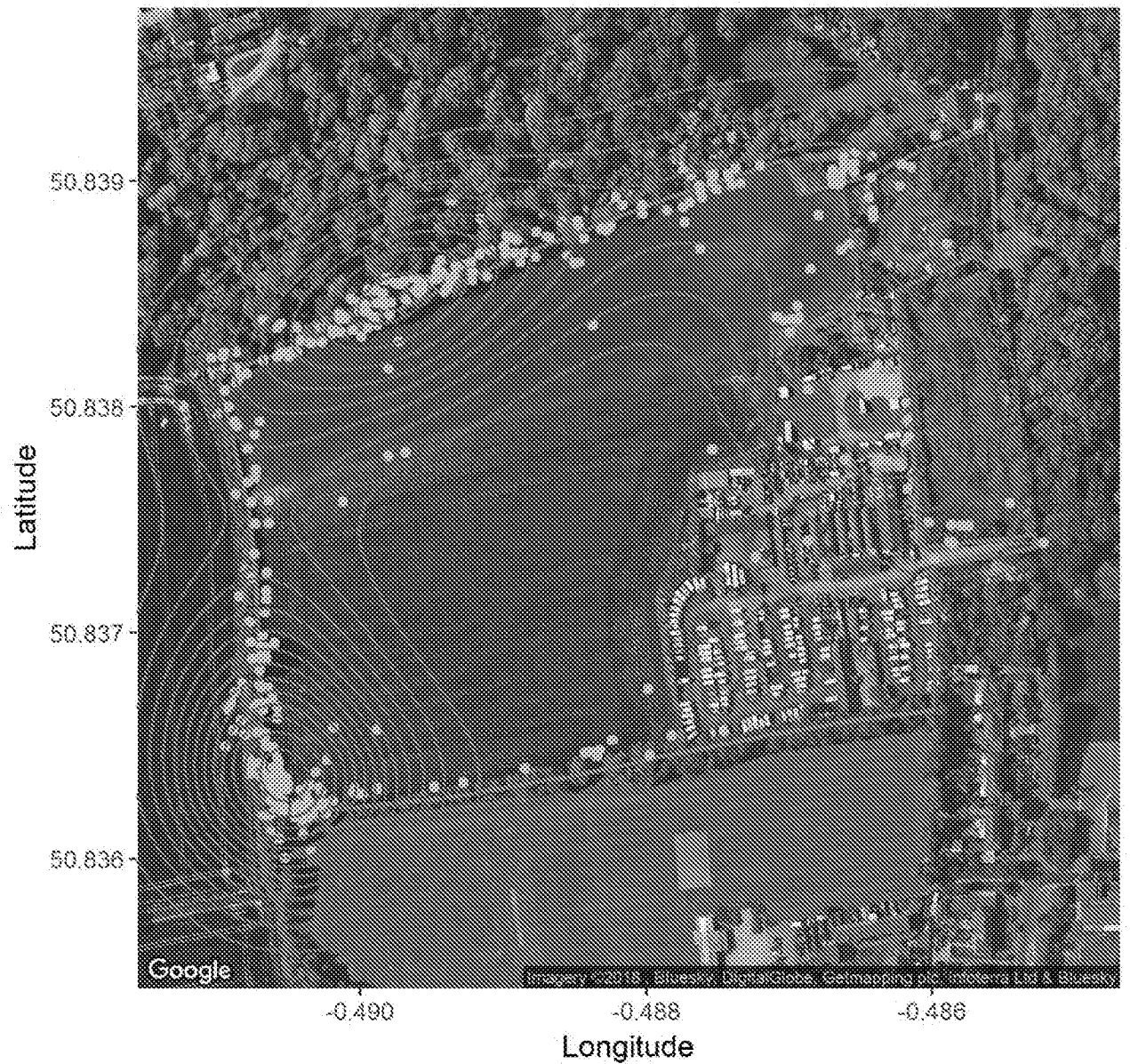


Figure F.3. The locations of each bat contact recorded during transect surveys, with contour lines indicating the density of contacts. Closer contours represent more concentrated bat activity.

Static Monitoring Results

The weather conditions experienced during the five nights where data was analysed are provided in Table F.5 below.

Table F.5. Overnight weather conditions during static monitoring periods

Survey Month	Dates Sampled	Temperature (°C)		Precipitation	Cloud Cover (%)		Wind (mph)	
		Min	Max		Min	Max	Min	Max
September	06/09/17	15	17	Dry	0	74	12	13
September	07/09/17	12	17	Dry	84	100	8	21
September	08/09/17	15	17	Moderate rain at 21:00	16	100	13	24
September	09/09/17	11	12	Dry	0	25	18	22
September	10/09/17	9	13	Dry	0	39	7	24
September	20/09/17	15	15	Dry	46	46	23	23
September	21/09/17	14	15	Dry	0	58	21	25
September	22/09/17	11	12	Dry	0	0	8	12
September	23/09/17	11	15	Dry	0	54	10	14
September	24/09/17	14	17	Dry	0	78	9	14
May	10/05/18	9	13	Dry	3	37	5	15
May	11/05/18	10	14	Light rain from 21:00 to 03:00	51	100	4	14
May	12/05/18	9	11	Very light rain at 21:00 and light rain at 03:00	56	89	5	9
May	13/05/18	8	11	Dry	3	17	8	17
May	14/05/18	11	16	Dry	9	86	11	16
June	08/06/18	13	16	Dry	25	69	5	7
June	09/06/18	13	16	Dry	25	93	6	10
June	10/06/18	13	16	Dry	24	32	9	10
June	11/06/18	12	16	Very light rain at 21:00 and 00:00	39	88	9	12

The total number of bat passes recorded across all monitoring locations for each bat species are provided in Figure F.4 and Table F.6 below.

Calls from common pipistrelle were the most frequently recorded, in addition to a large number of calls from soprano pipistrelle and Myotis species. A significant number of barbastelle calls were also recorded, with a small number from noctule, Nyctalus species, pipistrelle species, brown long-eared, Nathusius' pipistrelle and Nyctalus/Eptesicus species.

The majority of calls were recorded at MP1 (northern boundary, woodland edge, early September 2017) and MP3 (western boundary, hedgerow). A large number of soprano pipistrelle and Myotis species calls were recorded at MP1, and common pipistrelle at MP3 with fewer calls from other species than MP1 but the greatest number of species recorded overall. A moderate number of calls were recorded at MP5 (northern boundary, woodland edge, May 2018). Few calls were recorded at MP2 (tree in north-east of Site), MP4 (building in north-east of Site) or MP6 (southern boundary).

Two common pipistrelle calls were recorded by the static detector deployed inside B13 in June 2018. These calls were not indicative of cluttered flying conditions, so are most likely to be from bats passing by the door of the building, rather than using the interior space itself. No other calls were recorded.

It should be noted that comparisons drawn of the number of passes by different species can only give an indication of relative species abundance at the Site, as detectability varies between species.

Figure F.5 and Table F.7 show the total bat passes per hour recorded at all monitoring points surveyed.

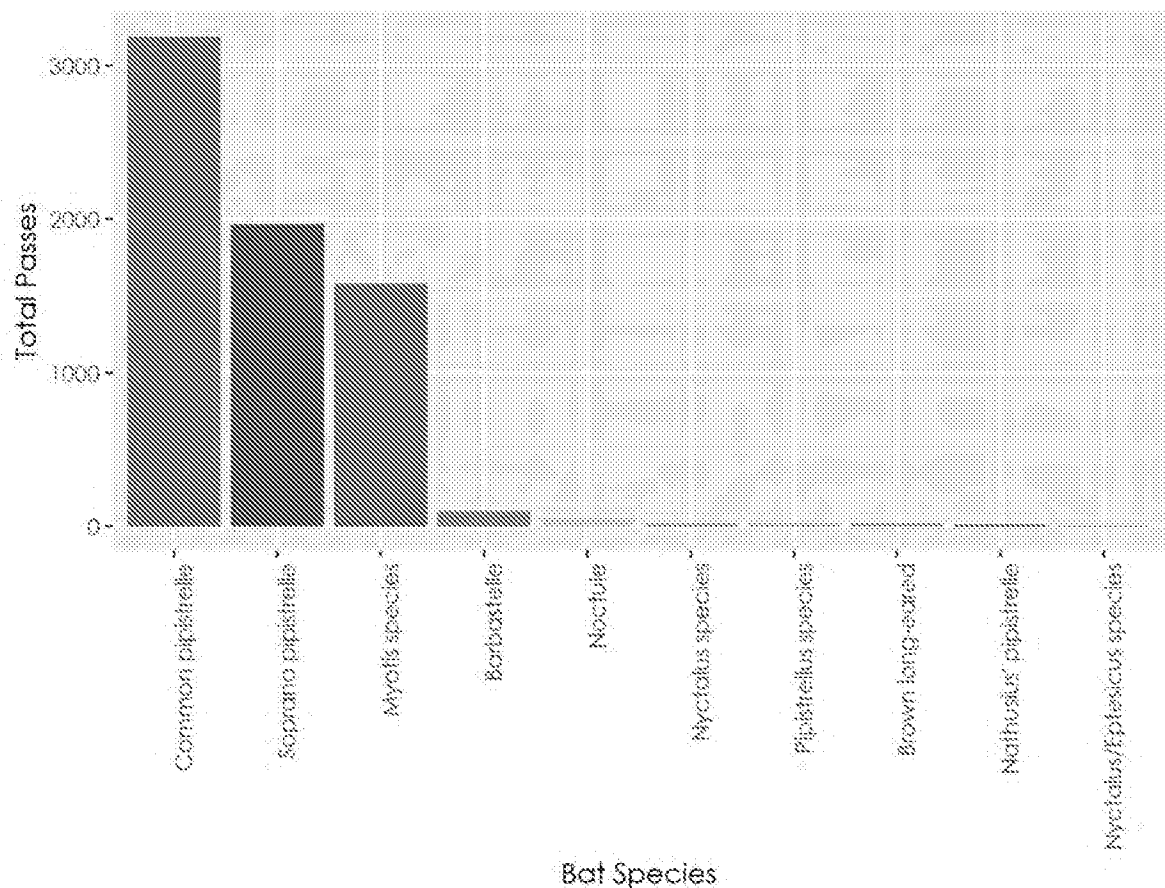


Figure F.4. Bat passes per species recorded in total during the static monitoring surveys

Table F.6 Bat passes per species recorded in total during static monitoring periods (early and late September 2017, and May 2018) with two detectors per monitoring period

Common pipistrelle	Soprano pipistrelle	Myotis species	Barbastelle	Noctule	Brown long-eared	Nathusius' pipistrelle	Nyctalus species	Nyctalus/Eptesicus species	Pipistrellus species
3190	1966	1579	96	49	13	5	20	2	18

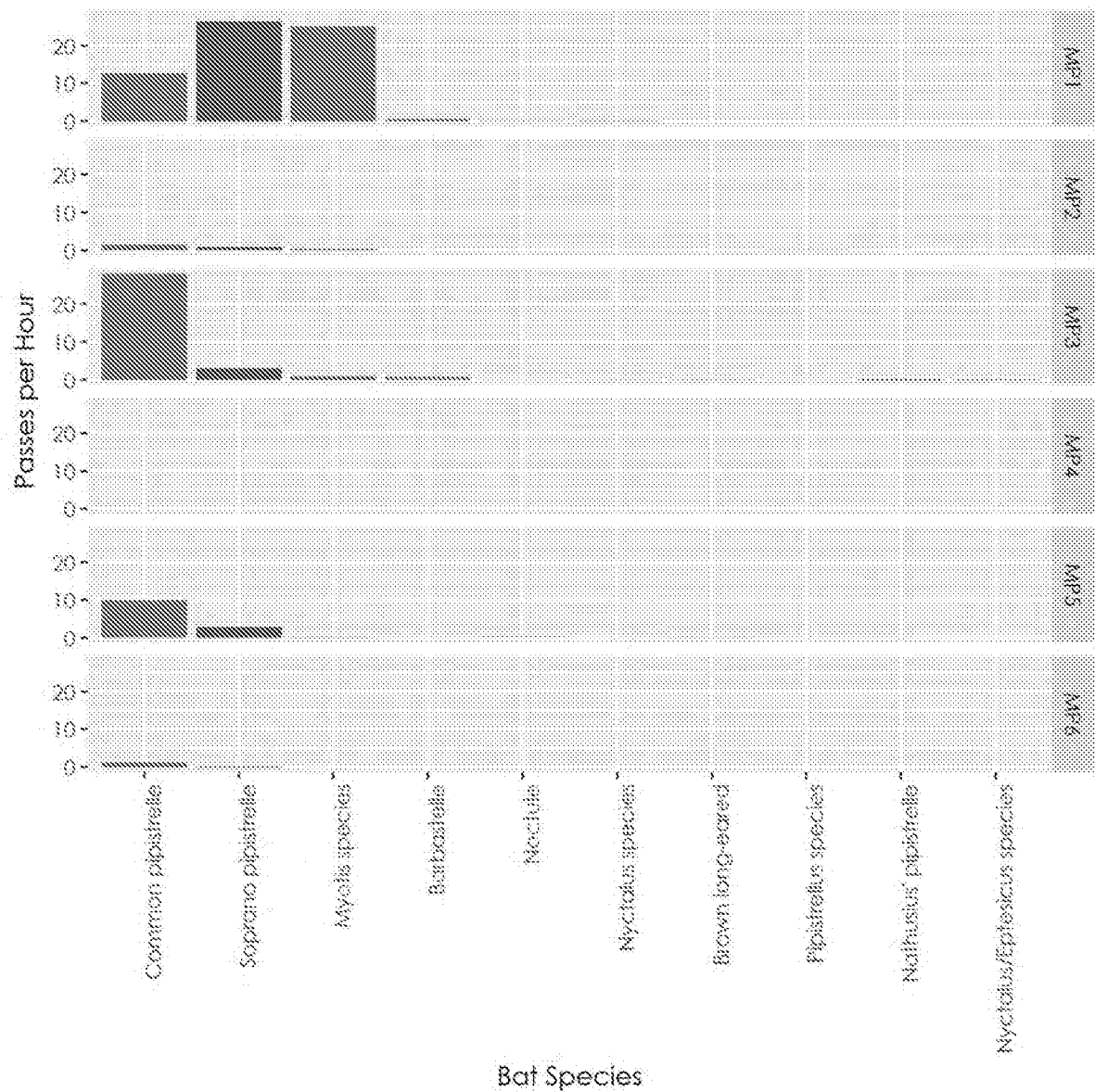


Figure F.5. Average bat passes per hour recorded for each bat species at each static monitoring point, across all monitoring periods

Table F.7. Average bat passes per hour recorded for each bat species at each static monitoring point, across all monitoring periods

MP	Common pipistrelle	Soprano pipistrelle	Myotis species	Barbastella	Noctule	Nyctalus species	Brown long-eared	Pipistrellus species	Nathusius' pipistrelle	Nyctalus/Eptesicus species
MP1	12.69	26.41	24.97	0.67	0.40	0.18	0.05	0.02	0.00	0.02
MP2	1.46	0.94	0.37	0.02	0.02	0.02	0.02	0.15	0.00	0.00
MP3	27.93	2.89	0.89	0.85	0.14	0.08	0.06	0.06	0.06	0.02
MP4	0.08	0.02	0.02	0.00	0.00	0.00	0.00	0.03	0.00	0.00
MP5	10.12	2.90	0.17	0.00	0.31	0.06	0.10	0.02	0.02	0.00
MP6	1.19	0.15	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00

Photosheet



Plate 1. Northern and western aspect of bungalow (B1)



Plate 2. Southern and eastern aspect of bungalow (B1) with missing mortar under hip tiles.



Plate 3. Western aspect of extension section of bungalow (B1) with gaps under tiles around window and in valley.



Plate 4. Northern aspect of bungalow (B1) with gaps under tiles around chimney.



Plate 5. Loft of bungalow (B1)



Plate 6. B2a from the east



Plate 7. Wall between B2a and B2b showing gappy metal cladding.



Plate 8. B2b from the east

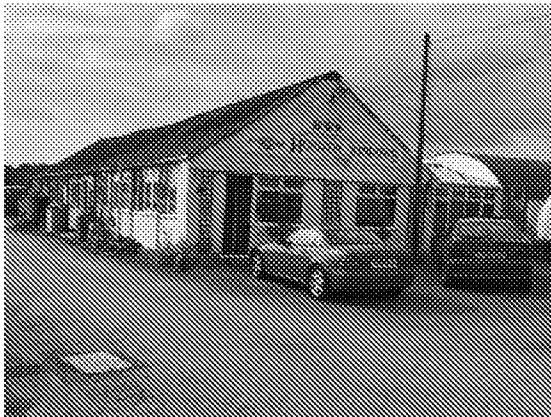


Plate 9. B3 from the east



Plate 10. B3 from the west

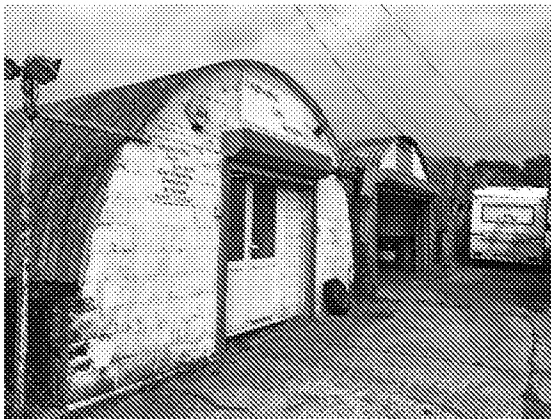


Plate 11. B4 from the west

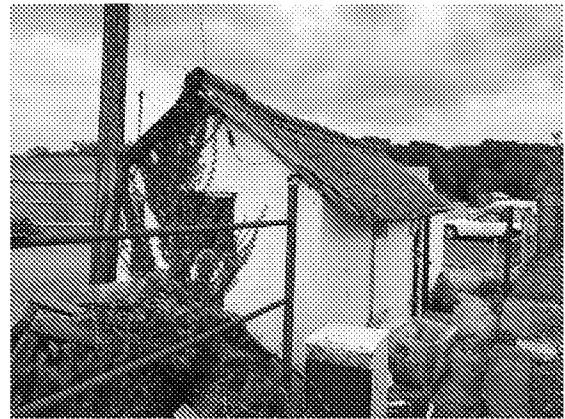


Plate 12. B5

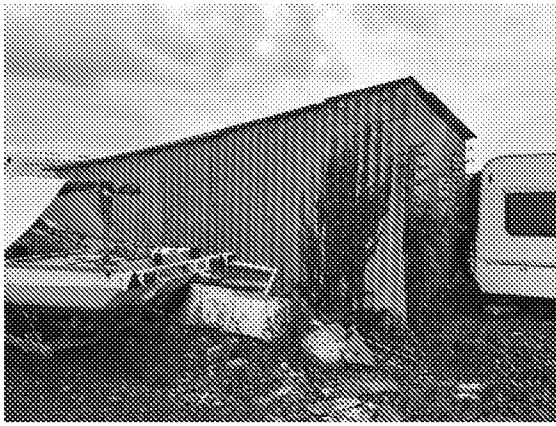


Plate 13. B6

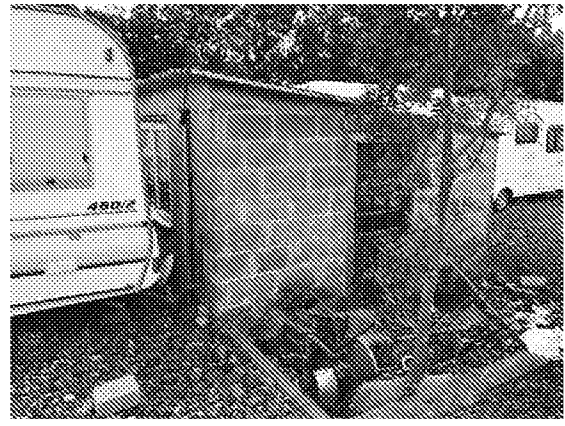


Plate 14. B7

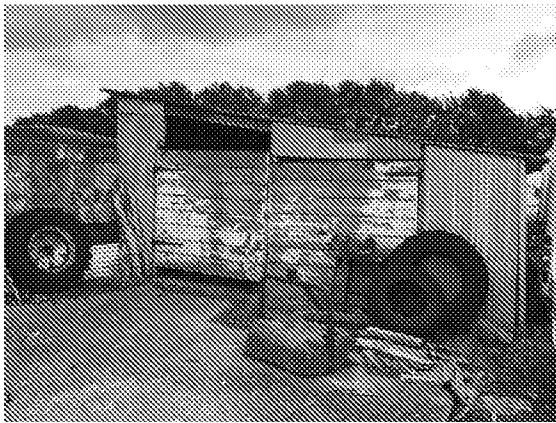


Plate 11. B8



Plate 12. B9



Plate 15. B15



Plate 16. B13 – ivy covered dilapidated barn

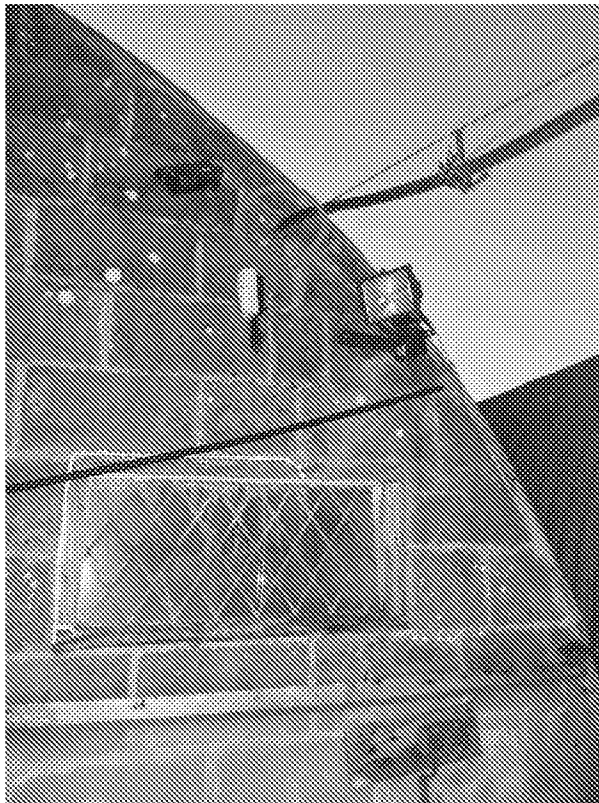


Plate 17. B4d showing hole in brickwork where soprano pipistrelle emerged in June 2018



Plate 17. B3 showing ridge tiles where common pipistrelle emerged in June 2018

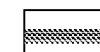
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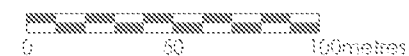
Legend



Site boundary



Walked transects



Office 20, Gillingham, 93 Gillingham Road,
Brighton BN1 4ST

t: 01273 573871
e: brighton@csa-environmental.co.uk
w: csa-environmental.co.uk

Project Land West of Arundel Road, Angmering

Drawing Title Bat Activity Survey Transect Routes Plan

Client Gladman Developments Ltd.

Date June 2018

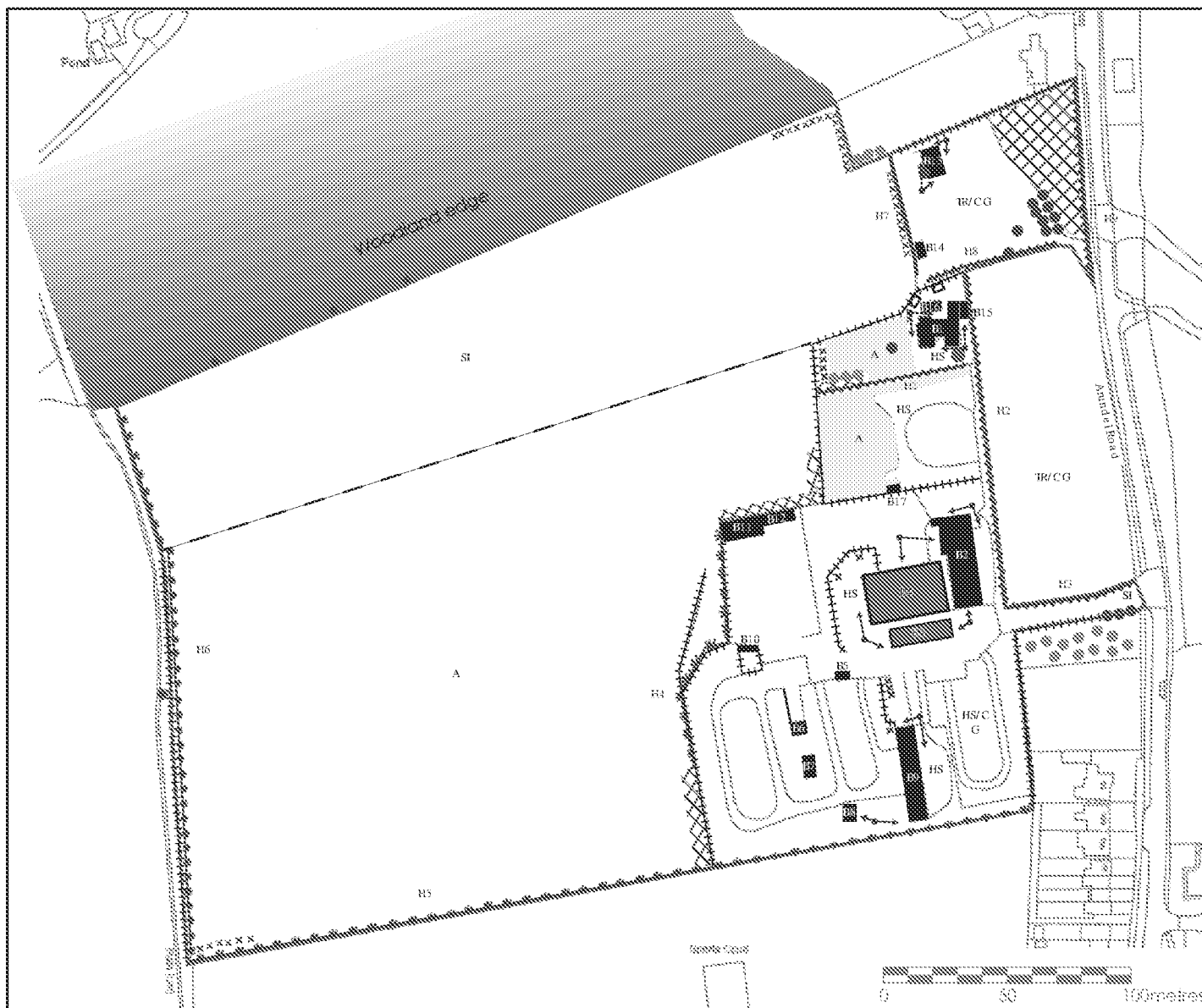
Scale: A4 See scale bar

Drawn JT

Drawing No. CSA/3467/109

Rev. A

Checked CC



Legend

- Site Boundary
- Surveyor locations
- Buildings with no bat activity
- Buildings with confirmed roosts



Office 20, Gillingham, 93 Gillingham Road,
Brighton BN1 4ST

T: 01273 573871
E: brighton@csa-environmental.co.uk
W: csa-environmental.co.uk

Project Land West of Arundel Road, Angmering
Drawing Title Bat Emergence and Return to Roost survey Plan
Client Gladman Developments Ltd.

Date: June 2018
Drawing No. CSA/3467/122
Scale: 1:100 See scale bar
Rev. A
Drawn: AS
Checked: JT

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Appendix G

Dormouse Survey Report

Legislation

The hazel dormouse *Muscardinus avellanarius* is legally protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and is afforded significant further protection as a European Protected Species under the Conservation of Habitats and Species Regulations 2017 (as amended).

Collectively and in summary, this legislation *inter alia* makes it an offence to:

- Intentionally or deliberately kill, injure or capture dormice;
- Intentionally, deliberately or recklessly disturb dormice in such a way as to be likely to significantly affect the ability of any significant group of dormice to survive, breed, or rear or nurture their young or the local distribution of or abundance of the species;
- Intentionally or recklessly damage, destroy or obstruct access to places used by Dormice for shelter or protection (whether occupied or not) or intentionally or recklessly disturb a dormouse whilst it is occupying such a place;
- Damage or destroy a breeding site or resting place of a dormouse;
- Possess or transport a dormouse (or any part thereof) unless under licence; and
- Sell or exchange dormice.

Development proposals affecting the dormouse require a European Protected Species licence from Natural England.

Methods

Dormouse nest tubes were installed at the site on 27 March 2018 by Jessica Taft Grad CIEEM and Kate Wolstenholme. The intention of these surveys is to determine the presence or likely absence of dormice within suitable habitat within all areas that will be impacted. A total of 63 dormouse nest tubes were distributed across the Site, along boundary vegetation, including hedgerows and patches of scrub. The location of these nest tubes is shown in the Dormouse Survey Plan (CSA/3467/118).

Nest tubes are made from stiff, double-walled black plastic sheets or similar material, 25cm long with a 5cm x 5cm cross-section. A thin plywood tray is inserted into the tube with a short projection at one end and an end block at the other which seals the tube. The tubes are then tied in a suitable location along a horizontal branch in vegetation. Dormice are known to readily use these tubes to build their nests (Natural England, 2006).

Monthly checks of these tubes for the presence of dormice and/or their nests commenced in April 2018. The checks are being undertaken by

Jessica Tait, Kate Wolstenholme and licensed surveyor Alexandria Shaw GradCIEEM (2017-32017-CLS-CLS). Bird droppings and other material such as wood mouse nests are cleaned out if found, to maintain the potential of each tube to be used by dormice.

Limitations

Checks of the final nest tube (number 63) have thus far not been possible due to a locked gate preventing access at the time of survey. On the second (May) check, it was noted that two treadles/trays were in need of replacement (replacement completed during the June check), meaning these two tubes of the 63 were not available for use for a period during between 18 April and 14 May 2018. In the June visit, tube 57 could not be found so was not checked.

For dormice which escaped on approach to the tubes, it was not possible to collect any biometric data (i.e. weight, sex, age class, breeding status).

Otherwise, no further limitations to the survey have been encountered.

Results

The results of the dormouse survey are detailed in Table G.1 and summarised below.

The presence of dormice on site was confirmed during the May check, with two individuals clearly observed escaping from tubes 35 and 58 (within each of which nests had been built) on approach. No biometric data on the two dormice were recorded as these were escapees and not handled.

An additional six likely dormouse nests were recorded during the survey, with no dormice present. A possible dormouse nest constructed of bracken was recorded in tube 59 in May, which was damp and unoccupied at the time of survey. Further possible dormouse nests were recorded in tubes 8 and 22 in June, 36 in July, and 39 and 42 in September, all of which were constructed of woven grass and leaves, and were empty at the time of survey. Nest photographs are provided below.

The locations of these findings are shown on the Dormouse Survey Results Plan (CSA/3467/120), with dormice recorded along Hedgerows H6 at the west of the Site and H2 at the east, and possible dormouse nests along H3 and H9 at the east, and the woodland edge along the northern site boundary.

Table G. 1 Results of the April, May and June 2018 dormouse survey visits at land to the west of Arundel Road, Angmering.

Tube No.	Location	Date and Surveyor(s)					
		18/04/18	14/05/18	06/06/18	03/07/18	02/08/18	05/09/18
		JT/KW	JT/KW	AS/JT	AS/KW	AS	AS/JT
1	H1	-	-	-	-	-	-
2	H1	-	-	-	-	-	2 x green leaves
3	H1	-	-	-	-	-	-
4	Scrub west of Bungalow garden	-	-	-	Treadle out, replaced	Treadle out, replaced	Treadle out
5	H8	-	-	-	-	-	-
6	H8	-	-	-	-	-	-
7	H8	-	-	-	-	-	Green and brown leaves and some strips of grass.
8	Ash by gate on H9	-	-	Possible dormouse nest, woven grass and green leaves.	Same as previous month. No new nest material	Same as previous month	Same as previous month
9	NE scrub corner	-	-	-	-	-	Green and brown leaves, wood mouse (male, 11g)
10	NE scrub corner	-	-	-	-	-	-
11	NE scrub corner	-	-	-	-	-	-
12	NE scrub corner	-	-	-	Treadle out, replaced	-	-
13	H7	-	Needs new treadle	Treadle replaced	-	-	Food cache
14	H7	-	-	-	-	-	Food cache
15	H7	-	-	-	Not found	-	Green and brown leaves, food cache
16	H7	-	-	-	-	-	-

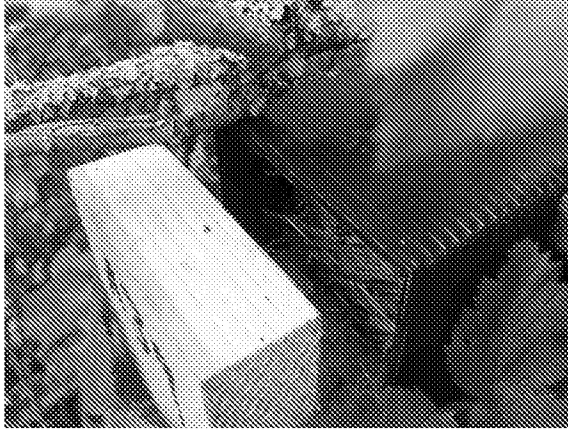
Tube No.	Location	Date and Surveyor(s)					
		18/04/18	14/05/18	06/06/18	03/07/18	02/08/18	05/09/18
		JT/KW	JT/KW	AS/JT	AS/KW	AS	AS/JT
17	Woodland edge	-	-	-	-	-	-
18	Woodland edge	-	-	-	-	Tre ad le out, replaced	-
19	Woodland edge	-	-	-	-	-	Food cache
20	Woodland edge	-	-	-	-	-	-
21	Woodland edge	-	-	-	-	Tre ad le out, replaced	Tre ad le out
22	Woodland edge	-	-	-	-	-	-
23	Woodland edge	-	-	Possible dormouse nest, woven grass, leaves, bracken.	Same as previous month. No new nest material	Same as previous month	Same as previous month
24	Woodland edge	-	-	-	-	-	Food cache
25	Woodland edge	-	-	-	-	-	Food cache
26	Woodland edge	-	-	-	-	-	-
27	Woodland edge	-	-	-	-	-	-
28	Woodland edge	-	-	Needs new tre ad le	Tre ad le replaced	-	-
29	Woodland edge	-	-	-	Few brown leaves	Tre ad le out, replaced	-
30	Woodland edge	-	-	-	-	-	Food cache
31	Woodland edge	-	-	-	-	-	Food cache
32	Woodland edge	-	-	-	-	-	Food cache
33	Woodland edge	-	Start of birds nest	Same as previous	Same as previous	Same as previous	Same as previous, with food cache
34	H6	-	-	-	-	-	-
35	H6	-	Dormouse escaped, white tail tip. Nest with green leaves and woven grass.	Same nest, green leaves.	Same nest, one green leaf, warm nest.	Same nest, no new material.	Same as previous month, plus food cache.

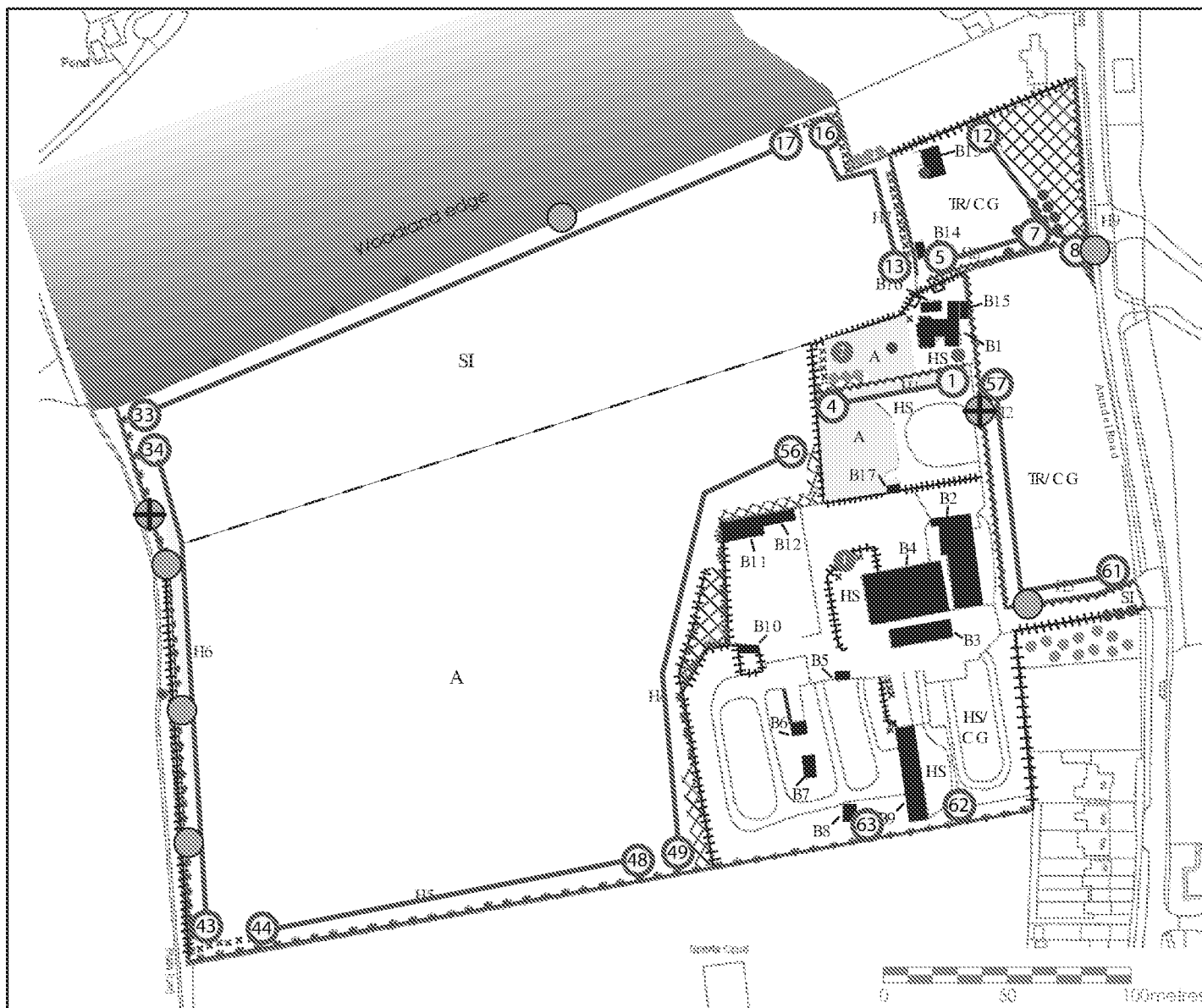
Tube No.	Location	Date and Surveyor(s)					
		18/04/18	14/05/18	06/06/18	03/07/18	02/08/18	05/09/18
		JT/KW	JT/KW	AS/JT	AS/KW	AS	AS/JT
36	H6	-	-	-	Possible dormouse nest with tightly woven grass and green leaves.	Same as previous month, nest damp.	Same as previous month.
37	H6	-	-	-	-	-	-
38	H6	-	-	-	-	-	-
39	H6	-	-	-	Not found	Not found	Possible dormouse nest, woven grass, old and damp.
40	H6	-	-	-	-	-	-
41	H6	-	-	-	-	Brown and green leaves, not woven	Same material, damp
42	H6	-	-	-	-	-	Possible dormouse nest, woven grass and green leaves
43	H6	-	-	-	-	-	-
44	H5	-	-	-	-	-	-
45	H5	-	-	-	-	-	-
46	H5	-	-	-	Treadle out, replaced	-	-
47	H5	-	-	-	-	-	-
48	H5	-	-	-	-	-	-
49	Corner of H5 and H4	-	-	Wren's nest with fledglings possibly in tube or very nearby, so tube not checked.	-	-	-
50	H4	-	-	-	-	Couldn't reach	-
51	H4	-	-	-	-	-	-
52	H4	-	-	-	-	-	-

Tube No.	Location	Date and Surveyor(s)					
		18/04/18	14/05/18	06/06/18	03/07/18	02/08/18	05/09/18
		JT/KW	JT/KW	AS/JT	AS/KW	AS	AS/JT
53	H4	-	-	-	-	Green and brown leaves	Same as previous month
54	H4	-	-	-	-	-	-
55	Field maple corner of B11	-	Needs new treadle	Treadle replaced	-	-	-
56	Scrub between telegraph pole and B12	-	-	Not found	Not found	Not found	Not found
57	H2	-	-	-	Green and brown leaves	Same as previous month	Same as previous month
58	H2	-	Dormouse escaped, nest of woven grass and leaves.	Same nest, no new material	Same nest, no new material	Same as previous month, no new material	Wood mouse (male, 23g)
59	Corner of H2 and H3	-	Possible dormouse nest, tightly packed bracken, damp.	Same nest, no new material	Same nest, no new material	Same nest, no new material	Same nest, no new material
60	H3	-	-	-	-	-	-
61	H3	-	-	-	-	-	-
62	H5, on elder within caravan park	-	-	-	-	-	-
63	H5, ivy bramble bank east of B9	Gate locked	Gate locked	Gate locked	-	Couldn't find	-

Below: dormouse nest at Hedgerow H6, from which a dormouse with white tail tip was observed escaping in May 2018.

Right: possible dormouse nest at H2.





-  Dormouse tube locations and reference numbers
-  Dormouse and nest recorded
-  Possible dormouse nest recorded

For habitats symbol key please refer to the Habitats Plan (CSA/3467/102)



Office 20, Gifford, 93 Offchilling Road,
Brighton BN1 4ST

t: 01273 573871
e: brighton@csa-environmental.co.uk
w: csa-environmental.co.uk

Project Land West of Arundel Road, Angmering

Drawing Title Dormouse Survey Plan

Client Gladman Developments Ltd.

Date: September

Drawing No. CSA/3467/120

Scale: A4

See scale
bar

Rev. A

Drawn: JT

Checked: CC

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Appendix H

Ba d g e r S u r v e y R e p o r t

Legislation

Badgers and their setts are protected under the Protection of Badgers Act 1992 therefore a Natural England licensing system exists to permit certain works that would otherwise be illegal. Works that require a license include direct impacts to badger holes and certain works within close proximity to a badger sett that may disturb badgers.

Method

A dedicated badger survey was conducted in April 2018 by Jessica Taft GradCIEEM, using standard survey methods, searching the Site and immediately adjacent areas for field signs of badger and mapping any present such as:

- Feeding signs such as snuffle holes made during foraging.
- Hairs caught on vegetation or fences.
- Latrines, usually positioned on territorial boundaries.
- Foraging tracks through vegetation or under fences.
- Badger setts.

When badger setts are found the number of holes are recorded as well as the level of usage. Recording this information gives an indication of the type of sett by categorising it according to the criteria listed in Table 2 below (Harris et al. 1989, Cresswell et al. 1990, Wilson et al. 1997).

Table G.1. Criteria used to determine sett type.

Sett Type
Main Setts - These usually have a large number of holes with large spoil heaps, and the sett generally looks well used. There will be well-used paths to and from the sett and between sett entrances. Although normally the breeding sett is in continuous use, it is possible to find a main sett that has become disused due to excessive digging or some other reason; it should be recorded as a disused main sett. In the first survey, the average size of an active main sett was twelve holes (including all categories of use).
Annexe setts - They are often close to a main sett, usually less than 150 metres away, and are usually connected to the main sett by one or more obvious well-worn paths. They usually have several holes, but may not be in use all the time even if the main sett is very active. In the first survey the average size was five holes (including all categories of use).
Subsidiary setts - These often only have a few holes; four (including all categories of use) was the average number in the first survey. They are usually at least 50 metres from a main sett, and do not have an obvious path connecting with another sett. They are not continuously active.
Outlying setts - These usually have only one or two holes, often have little spoil outside the hole, have no obvious path connecting with another sett, and are only used sporadically. When not in use by badgers, they are often taken over by foxes or even rabbits. However, they can still be recognised as badger setts by the shape of the tunnel (not the actual entrance hole), which is usually at least 250mm in diameter, and is rounded or a flattened oval shape. Fox and rabbit tunnels are smaller and often taller than broad.
Hole Type
Well used holes - These are clear of any debris or vegetation, are obviously in regular use, and may or may not have been excavated recently.

Partially used holes - These are not in regular use and have debris such as leaves and twigs in the entrance, or have moss and / or other plants growing in or around the entrance. Partially used holes could be in regular use after a minimal amount of clearance.

Disused holes - These have not been in use for some time, are partially or completely blocked, and could not be used without a considerable amount of clearance. If the hole has been disused for some time, all that may be visible is a depression in the ground where the hole used to be, and the remains of the spoil heap, which may be covered in moss or plants.

Results

Signs of badger activity and a badger sett were observed on Site. Full details have not been included here for confidentiality reasons, to protect badgers. Further information and a survey results plan (CSA/3467/121) have been included within a separate badger report (CSA/3467/06).

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Appendix I

Re p tile Surve y Re p o rt

Legislation

All native British reptiles are afforded protection against intentional or reckless killing and injury, under the Wildlife and Countryside Act 1981. This includes the widespread reptile species, slow-worm *Anguis fragilis*, common lizard *Zootoca vivipara*, grass snake *Natrix natrix* and adder *Vipera berus*.

Two rare species, sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca*, are additionally protected under the Conservation of Habitats and Species Regulations 2017 which afford strict protection (via Regulation 41) for species listed within Schedule 2. However the Site does not offer opportunities for these species.

In addition to their legal protection, all British reptile species are also included on a list of species of principal importance for conserving biodiversity in England, which was drawn up in response to the Natural Environment and Rural Communities (NERC) Act 2006 (Section 41).

Methods

Approximately 106 refugia, comprising of squares of roofing felt (minimum size of 0.5 x 0.5m) were distributed across all suitable areas of habitat on 27 March 2018. Mats were distributed across the site offering suitable habitat opportunities for reptiles to determine presence / absence. Areas of the site included within the survey are shown on the Reptile Survey Plan (CSA/3467/119).

Following a period of 'bedding-in' ten daytime survey visits were carried out from 19 April to 07 June 2018, during which time the refugia were checked for the presence of reptiles. Careful visual searching between refugia was also undertaken. This survey effort is considered to provide a reasonable survey effort with which to establish the presence / absence of reptile species at the Site. On each occasion the surveys were carried out in suitable weather conditions for reptile basking as shown in Table J1. The full results are presented in Table I.2, alongside the date of each survey.

Table I.1 Reptile survey weather conditions April – June 2018

Survey Date	Time	Temperature (°C)	Cloud Cover (Okta s)	Wind (Beaufort Scale)	Precipitation
19/04/2018	10.45-11.15	18	0/8	1	None
25/04/2018	15.45-16.30	13	3/8	3	Rain just before survey
01/05/2018	17.00-17.30	11	1/8	4	None
09/05/2018	17.00-17.30	14	2/8	3	None
14/05/2018	17.30-18.00	17	3/8	5	None
01/06/2018	13.15-14.30	19	8/8	1	Rain overnight
07/06/2018	10.30-11.30	16	7/8	2	None

Re sults

A single common lizard was found during reptile surveys within Area B (see Reptile Survey Plan CSA/3467/119). No other reptiles were recorded during these surveys. Based on suitable reptile habitat which forms c. 2.2ha of the Site, the estimated common lizard population size, using guidance from HGBI (1998)³ is considered to be low (<50/ha). Full results can be found in Table J2.

³ Herpetofauna Groups of Britain and Ireland (HGBI), 1998. Evaluating Local Mitigation/Translocation Programmes: Maintaining Best Practice and Lawful Standards. HGBI Advisory Notes for Amphibian and Reptile Groups (ARGs). Halesworth: Froglife.

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Appendix J

GCN survey report
Pond plan (CSA/3467/112)

Legislation

Great crested newts are legally protected as European Protected Species (EPS) under Part 3 (Section 41) of the Conservation of Habitats and Species Regulations 2010. These Regulations make it an offence to:

- Deliberately capture, injure, kill or capture a great crested newt
- Deliberately disturb great crested newts, impairing their ability to survive, breed, reproduce or rear/nurture their young
- Damage or destroy a breeding site or resting place used by a great crested newt

Great crested newts are also fully protected under the Wildlife & Countryside Act 1981, making it an offence to:

- Intentionally or recklessly disturb a great crested newt while it is occupying a structure or place of shelter or protection
- Intentionally or recklessly obstruct access to any structure or place of shelter or protection

Disturbance of great crested newts is covered by both the 2010 Regulations and the 1981 Act. Disturbance that impairs survival or successful reproduction would be covered by the Regulations, while less significant acts of disturbance may only be covered by the Act.

It is important to note that great crested newts and their habitats (such as breeding ponds) are protected throughout the year, regardless of whether or not newts are present at the time.

Great crested newts are also listed as a species of principal importance for the conservation of biodiversity in England, under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006. The S41 species list is used to guide decision-makers, including planning authorities, in implementing their duty under Section 40 of the NERC Act to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

Licensing

Where development is proposed that would result in an offence under the Habitats and Species Regulations, a statutory derogation licence may be granted by Natural England to permit an act that would otherwise be unlawful. To obtain an EPS licence for development, it must be demonstrated that the purpose of the act to be licensed is for:

“preserving public health or public safety or other imperative reasons of overriding public interest including those of social or economic nature and beneficial consequences of primary importance for the environment”
(Regulation 53(2)(e))

In addition, Natural England will not grant an EPS licence unless they are satisfied that:

"There is no satisfactory alternative" (Regulation 53(9)(a))

"The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range" (Regulation 53(9)(b))

Methods

In accordance with Natural England's Great Crested Newt Mitigation Guidelines (2001), a desktop search was undertaken to identify ponds within 500m of the Site which may have potential to support breeding great crested newts *Triturus cristatus*, using Ordnance Survey (OS) mapping, the MAGIC database and aerial photography. 500m is the generally accepted typical maximum dispersal range of this species, with great crested newt most likely to use terrestrial habitat within 250m of breeding ponds.

The desk based search for ponds and subsequent site visits identified eight water bodies occurring within 500m of the Site. These ponds are all identified on the Pond Plan (CSA/3467/112).

Habitat Suitability Index (HSI) Assessment

Where ponds were situated within a 500m radius and connected to the Site by traversable terrestrial habitats, access permission was requested to undertake a Habitat Suitability Index (HSI) assessment, using the standard approach set out by Oldham et al (2000). These assessments were undertaken by licensed surveyor Jessica Tait GradCIEEM (Natural England GCN Licence Ref: 2016-26999-CLS-CLS) and Kate Wolstenholme. Pond 7, located c. 435m north-west of the Site was not assessed as this had been filled in.

Presence / Likely Absence Surveys

Following the HSI assessments, great crested newt presence / likely absence surveys were undertaken in suitable ponds within 500m of the survey area in accordance with Natural England guidelines. Access was granted for Ponds 1, 2, 5 and 7. Pond 3 was not surveyed as access was not granted, and Ponds 4 and 8 were not surveyed as they scored 'poor' suitability in the HSI assessment.

Survey visits were undertaken to confirm the presence / absence of GCN were completed in spring 2018 (surveys undertaken on 27 March and the 18, 25 April, and 01 May), using a combination of bottle trapping, torchlight searching, and egg searching survey techniques. On each survey where possible bottle traps were set out in the evening, before dusk. The traps were then checked and removed early the following morning and any captured newts were examined, recorded and then released. All surveys were undertaken by at least two surveyors, including at least one licenced great crested newt surveyor.

Torchlight surveys were carried out after dark at suitable temperatures, where the ponds were surveyed visually with one million candlepower Clulite TM

torches. Any amphibians seen were recorded, as well as air temperature, vegetation cover and turbidity of the water.

Egg searches were also conducted amongst any pond vegetation for the presence of great crested newt eggs.

Limitations

The pond assessments were undertaken outside of the optimum time period (May to September, inclusive) and so the aquatic vegetation coverage is unlikely to reflect that present during the GCN breeding season. For the HSI calculations, surveyors predicted the extent of vegetation cover in summer, based on the current extent and estimated growth rates of plant species.

Access permission was not granted for all ponds at the time of the HSI assessment; however, some ponds could be viewed and assessed as best as possible from public footpaths. Pond 5 was viewed from a distance, and was assumed to be largely similar to pond 6.

Precautionary assumptions were made regarding the presence of wildfowl and fish during the habitat suitability assessment of ponds 5 and 6. Once full access permission was granted for the presence / likely absence surveys, a large number of fish and wildfowl were noted in both ponds, meaning they were less suitable for GCN than originally assessed. However, on a precautionary basis, due to the excellent surrounding terrestrial habitat and connectivity to the site, full surveys were completed.

Similarly, no fish were noted during the HSI assessment of pond 1. During the presence / likely absence surveys, fish were recorded, meaning the pond is less suitable for GCN than originally assessed. However, as the pond is on site and would be lost as a result of the proposed development, it was surveyed on a precautionary basis.

Results

HSI Assessment

The HSI assessment concluded that Ponds 1, 2, 3, 5 and 6 had 'average' suitability to support breeding great crested newts, whilst both Pond 4 and Pond 8 had 'poor' suitability, as shown in Table J1.

Presence / Likely Absence Surveys

The presence / likely absence surveys found no evidence of GCN within any of the ponds that were surveyed. Other amphibians were recorded during the surveys however, including breeding common toad *Bufo bufo* and common frog *Rana temporaria*. Unidentified small newts seen during torchlight surveys were also recorded. Full results can be found below in Table J.2.

Table J.1 Summary of Habitat Suitability Index assessment results in December 2017 for ponds within a 500m radius of land to the west of Arundel Road, Angmering

Pond no.	SI ₁	SI ₂	SI ₃	SI ₄	SI ₅	SI ₆	SI ₇	SI ₈	SI ₉	SI ₁₀	HSI	Suitability
	Location	Pond Area	Pond Drying	Water Quality	Shade	Fowl	Fish	Ponds	Terrestrial Habitat	Macrophytes		
1	Zone A	<50m ²	Never Dries	Moderate	0-60%	Absent	Absent	6	Moderate	46-50%	0.65	Average
2	Zone A	125m ²	Sometimes Dries	Moderate	86-90%	Absent	Absent	7	Good	21-25%	0.66	Average
3	Zone A	50-100m ²	Sometimes Dries	Moderate	0-60%	Minor	Absent	11	Moderate	86-90%	0.65	Average
4	Zone A	<50m ²	Never Dries	Poor	0-60%	Absent	Major	6	Good	<1%	0.36	Poor
5	Zone A	>2000m ²	Never Dries	Poor	86-90%	Minor	Minor	9	Good	<1%	0.61	Average
6	Zone A	>2000m ²	Never Dries	Poor	86-90%	Minor	Minor	10	Good	<1%	0.61	Average
8	Zone A	1900m ²	Never Dries	Moderate	0-60%	Major	Major	2	Good	46-50%	0.34	Poor



Site Boundary



c. 500m radius from Site Boundary



Pond location and number

Pond number	Distance to Site	HSI Score	Suitability
1	On-site	0.65	Average
2	95m east	0.66	Average
3	260m south-west	0.65	Average
4	130m north	0.57	Below average
5	85m north-west	0.61	Average
6	260m west	0.61	Average
7	433m north-west	Filled in	-
8	480m north-west	0.34	Poor

CSA
environmental

Office 20, Gilbride, 93 Offchurch Road,
Brighton BN1 4ST

T: 01273 573871
E: brighton@csa-environmental.co.uk
W: csa-environmental.co.uk

Project Land West of Arundel Road, Angmering

Drawing Title Pond Plan

Client Gladman Developments Ltd.

Date: Dec 2017

Drawing No. CSA/3467/112

Scale: A4 See scale bar

Rev: -

Drawn: JT

Checked: CC

Pond Assessment

GENERAL INFORMATION	
Pond Number: 1	Site description: Garden pond next to hedge, some amenity grassland and introduced shrub planting. Plastic liner and stone border. Plants include water lily and waterweed.
OS Grid Reference: TQ066053	

HABITAT SUITABILITY FACTORS	SI SCORE	
1. Map location A (optimal), B (marginal) or C (unsuitable)	A	1
2. Pond area in m ² Estimate	<50m ²	0.05
3. Number of years in 10 pond dries up Estimate or ask landowner	Never Dries	0.9
4. Water quality 1 = bad, 2 = poor, 3 = moderate, 4 = good	Moderate	0.67
5. Percentage perimeter shade to at least 1m from shore Estimate	0-60%	1
6. Waterfowl impact (excluding moorhen) 1 = major, 2 = minor, 4 = absent	Absent	1
7. Fish presence 1 = major, 2 = minor, 3 = possible 4 = absent	Absent	1
8. Number of ponds within 1km not separated by barriers	6	0.84
9. Terrestrial habitat 1 = none, 2 = poor, 3 = moderate, 4 = good	Moderate	0.67
10. Percentage of pond surface occupied by aquatic vegetation (March – May)	46-50%	0.8

PHOTOGRAPH		
	HSI SCORE	CATEGORY
		Poor (<0.5)
		Below average (0.5 – 0.59)
	0.65	Average (0.6 – 0.69)
		Good (0.7 – 0.79)
		Excellent (>0.8)

Pond Assessment

GENERAL INFORMATION	
Pond Number: 2	Site description: Pond in campsite on edge of woodland / amenity grassland. Island in the middle. Steep earth banks, ditch and scrubby margins. Plants include iris and sedge. Leaf litter.
OS Grid Reference: TQ068053	

HABITAT SUITABILITY FACTORS	SI SCORE	
1. Map location A (optimal), B (marginal) or C (unsuitable)	A	1
2. Pond area in m ² Estimate	125m ²	0.25
3. Number of years in 10 pond dries up Estimate or ask landowner	Sometimes Dries	0.5
4. Water quality 1 = bad, 2 = poor, 3 = moderate, 4 = good	Moderate	0.67
5. Percentage perimeter shade to at least 1m from shore Estimate	86-90%	0.4
6. Waterfowl impact (excluding moorhen) 1 = major, 2 = minor, 4 = absent	Absent	1
7. Fish presence 1 = major, 2 = minor, 3 = possible 4 = absent	Absent	1
8. Number of ponds within 1km not separated by barriers	7	0.85
9. Terrestrial habitat 1 = none, 2 = poor, 3 = moderate, 4 = good	Good	1
10. Percentage of pond surface occupied by aquatic vegetation (March – May)	21-25%	0.55

PHOTOGRAPH		
	HSI SCORE	CATEGORY
		Poor (<0.5)
		Below average (0.5 – 0.59)
	0.66	Average (0.6 – 0.69)
		Good (0.7 – 0.79)
		Excellent (>0.8)

Pond Assessment

GENERAL INFORMATION	
Pond Number: 3	Site description: Ditch-fed pond in corner of arable field, connected to wider landscape via hedge/ditch. Lots of typha, some bramble scrub, young willow trees. Grassy bank c. 2m tall.
OS Grid Reference: TQ062049	

HABITAT SUITABILITY FACTORS	SI SCORE	
1. Map location A (optimal), B (marginal) or C (unsuitable)	A	1
2. Pond area in m ² Estimate	50-100m ²	0.1
3. Number of years in 10 pond dries up Estimate or ask landowner	Sometimes Dries	0.5
4. Water quality 1 = bad, 2 = poor, 3 = moderate, 4 = good	Moderate	0.67
5. Percentage perimeter shade to at least 1m from shore Estimate	0-60%	1
6. Waterfowl impact (excluding moorhen) 1 = major, 2 = minor, 4 = absent	Minor	0.67
7. Fish presence 1 = major, 2 = minor, 3 = possible 4 = absent	Absent	1
8. Number of ponds within 1km not separated by barriers	11	0.975
9. Terrestrial habitat 1 = none, 2 = poor, 3 = moderate, 4 = good	Moderate	0.67
10. Percentage of pond surface occupied by aquatic vegetation (March – May)	86-90%	0.9

PHOTOGRAPH		
	HSI SCORE	CATEGORY
		Poor (<0.5)
		Below average (0.5 – 0.59)
	0.65	Average (0.6 – 0.69)
		Good (0.7 – 0.79)
		Excellent (>0.8)

Pond Assessment

GENERAL INFORMATION	
Pond Number: 4	Site description: Small, lined pond with several inlet pipes and no vegetation.
OS Grid Reference: TQ063055	

HABITAT SUITABILITY FACTORS	SI SCORE	
1. Map location A (optimal), B (marginal) or C (unsuitable)	A	1
2. Pond area in m ² Estimate	<50m ²	0.05
3. Number of years in 10 pond dries up Estimate or ask landowner	Never Dries	0.9
4. Water quality 1 = bad, 2 = poor, 3 = moderate, 4 = good	Poor	0.33
5. Percentage perimeter shade to at least 1m from shore Estimate	0-60%	1
6. Waterfowl impact (excluding moorhen) 1 = major, 2 = minor, 4 = absent	Absent	1
7. Fish presence 1 = major, 2 = minor, 3 = possible 4 = absent	Absent	1
8. Number of ponds within 1km not separated by barriers	6	0.84
9. Terrestrial habitat 1 = none, 2 = poor, 3 = moderate, 4 = good	Good	1
10. Percentage of pond surface occupied by aquatic vegetation (March – May)	<1%	0.3

PHOTOGRAPH		
Landowner could not be contacted. Pond was viewed from the driveway, so photograph is not shown here.	HSI SCORE	CATEGORY
		Poor (<0.5)
	0.57	Below average (0.5 – 0.59)
		Average (0.6 – 0.69)
		Good (0.7 – 0.79)
		Excellent (>0.8)

Pond Assessment

GENERAL INFORMATION	
Pond Number: 5	Site description: Large pond with sluice gate, mature trees at margins, surrounded by woodland on one side and grassland on other. Lots of leaf litter, little vegetation.
OS Grid Reference: TQ061053	

HABITAT SUITABILITY FACTORS	SI SCORE	
1. Map location A (optimal), B (marginal) or C (unsuitable)	A	1
2. Pond area in m ² Estimate	>2000m ²	1
3. Number of years in 10 pond dries up Estimate or ask landowner	Never Dries	0.9
4. Water quality 1 = bad, 2 = poor, 3 = moderate, 4 = good	Poor	0.33
5. Percentage perimeter shade to at least 1m from shore Estimate	86-90%	0.4
6. Waterfowl impact (excluding moorhen) 1 = major, 2 = minor, 4 = absent	Minor	0.67
7. Fish presence 1 = major, 2 = minor, 3 = possible 4 = absent	Minor	0.33
8. Number of ponds within 1km not separated by barriers	9	0.9
9. Terrestrial habitat 1 = none, 2 = poor, 3 = moderate, 4 = good	Good	1
10. Percentage of pond surface occupied by aquatic vegetation (March – May)	<1%	0.3

PHOTOGRAPH		
	HSI SCORE	CATEGORY
		Poor (<0.5)
		Below average (0.5 – 0.59)
	0.61	Average (0.6 – 0.69)
		Good (0.7 – 0.79)
		Excellent (>0.8)

Pond Assessment

GENERAL INFORMATION	
Pond Number: 6	Site description: Large pond with sluice gate, mature trees at margins, surrounded by woodland on one side and grassland on other. Lots of leaf litter, little vegetation.
OS Grid Reference: TQ059052	

HABITAT SUITABILITY FACTORS	SI SCORE	
1. Map location A (optimal), B (marginal) or C (unsuitable)	A	1
2. Pond area in m ² Estimate	>2000m ²	1
3. Number of years in 10 pond dries up Estimate or ask landowner	Never Dries	0.9
4. Water quality 1 = bad, 2 = poor, 3 = moderate, 4 = good	Poor	0.33
5. Percentage perimeter shade to at least 1m from shore Estimate	86-90%	0.4
6. Waterfowl impact (excluding moorhen) 1 = major, 2 = minor, 4 = absent	Minor	0.67
7. Fish presence 1 = major, 2 = minor, 3 = possible 4 = absent	Minor	0.33
8. Number of ponds within 1km not separated by barriers	10	0.95
9. Terrestrial habitat 1 = none, 2 = poor, 3 = moderate, 4 = good	Good	1
10. Percentage of pond surface occupied by aquatic vegetation (March – May)	<1%	0.3

PHOTOGRAPH		
	HSI SCORE	CATEGORY
		Poor (<0.5)
		Below average (0.5 – 0.59)
	0.61	Average (0.6 – 0.69)
		Good (0.7 – 0.79)
		Excellent (>0.8)

Pond Assessment

GENERAL INFORMATION	
Pond Number: 8	Site description: Large pond within pasture/improved grassland with mature trees. Plants include rushes, reeds, scrub, water lilies, sedge. Shallow earth banks.
OS Grid Reference: TQ061058	

HABITAT SUITABILITY FACTORS	SI SCORE	
1. Map location A (optimal), B (marginal) or C (unsuitable)	A	1
2. Pond area in m ² Estimate	1900m ²	0.81
3. Number of years in 10 pond dries up Estimate or ask landowner	Never Dries	0.9
4. Water quality 1 = bad, 2 = poor, 3 = moderate, 4 = good	Moderate	0.67
5. Percentage perimeter shade to at least 1m from shore Estimate	0-60%	1
6. Waterfowl impact (excluding moorhen) 1 = major, 2 = minor, 4 = absent	Major	0.01
7. Fish presence 1 = major, 2 = minor, 3 = possible 4 = absent	Major	0.01
8. Number of ponds within 1km not separated by barriers	2	0.6
9. Terrestrial habitat 1 = none, 2 = poor, 3 = moderate, 4 = good	Good	1
10. Percentage of pond surface occupied by aquatic vegetation (March – May)	46-50%	0.8

PHOTOGRAPH		
	HSI SCORE	CATEGORY
	0.34	Poor (<0.5)
		Below average (0.5 – 0.59)
		Average (0.6 – 0.69)
		Good (0.7 – 0.79)
		Excellent (>0.8)

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