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Preliminary Ecological Appraisal and Phase 1 Habitat Survey

Rev 03

Land West of Tye Lane, Walberton, West Sussex

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Report Summary

- 1. The Ecology Co-op has been commissioned by David Wilson Homes to undertake an Extended Phase 1 Habitat Survey at Land West of Tye Lane, Walberton, West Sussex. A site walkover survey visit was carried out on the 9th of February 2018 to map the habitat types and evaluate the site for its potential to support EU and UK protected species. The purpose of this report is to record the findings of the survey and identify potential ecological constraints to a proposed new residential development. This survey was undertaken by Jess Burkitt, BSc (Hons), Grad CIEEM.**
- 2. The site comprises four fields used for grazing horses and one large arable field. There are a number of ditches throughout the site with surrounding dense scrub patches with scrub patches along the boundaries of the site. There are hedgerows bordering all fields and improved grassland makes up the majority of Fields 2, 3, 4 and 5.**
- 3. In August 2020, a repeat site walkover was undertaken and an assessment of a small parcel of land added to the existing scheme was completed. This new parcel of land comprises a small residential garden area of mown amenity grassland, ornamental shrubs, a mature oak and species poor hedgerows with trees. This parcel of land is referred to as Field 6 in this report.**
- 4. Further surveys are required for bats, dormice, reptiles, great crested newts and breeding birds. Full details for these surveys are outlined in Section 4 of this report.**
- 5. In addition, if any protected species are identified within the site during the construction process, work must be stopped immediately, and an ecologist must be contacted immediately for advice.**

This report has been prepared by The Ecology Co-operation Ltd, with all reasonable skill, care and diligence within the terms of the Contract with the client. This report only becomes the property of the client once payment for it has been received in full.

We disclaim responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.



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1 INTRODUCTION

1.1 Purpose of the Report

The Ecology Co-op has been commissioned by David Wilson Homes to undertake an Extended Phase 1 Habitat Survey of Land West of Tye Lane, Walberton, West Sussex. This report presents the findings of a walkover survey undertaken by Jess Burkitt, a graduate member of the Chartered Institute for Ecology and Environmental Management (CIEEM) on the 9th of February 2018. It provides details on the potential for any protected species and/or habitats to be present at the site and provides an assessment of the potential ecological constraints to the proposed new residential development. Recommendations for further surveys that are likely to be required to inform an outline planning application and any required Ecological Impact Assessment (EclA) of the proposal are provided. Where appropriate, measures to avoid, mitigate and/or compensate for impacts are outlined.

1.2 Background

The site is located on Tye lane in Walberton, West Sussex. The central grid reference for the site is SU969063. The site comprises a single arable field and four pastoral fields used for grazing of horses and there are a number of ditches running through the land. There are a number of residential properties to the west, south and east with arable fields, the A27 and Ancient woodland to the north.

In August 2020, a small residential garden was added to the scheme and comprises short mown amenity grassland, ornamental shrubs, hedgerows with trees and a large mature oak. This parcel of land is referred to as Field 6 throughout the report. Figure 1 shows the boundary of the site.

The proposed development includes up to 155 new residential dwellings and associated parking and landscaping.

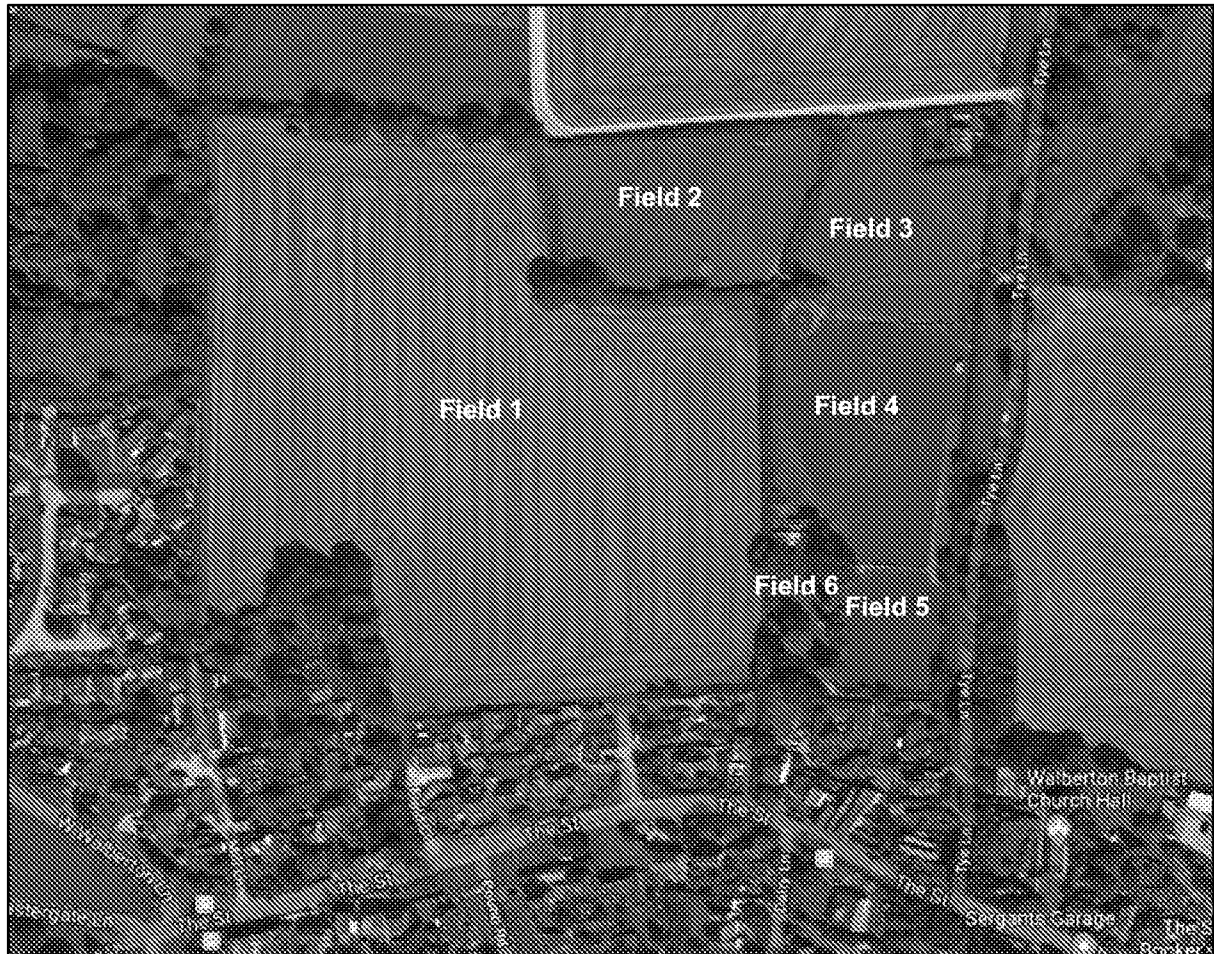


Figure 1. An aerial image showing the location of the site. The approximate site boundary is outlined in red. Images produced courtesy of Google maps (Map data ©2018 Google).

1.3 Policy and Legislation

Legal protection applying to relevant bird, mammal, herpetofauna and invertebrate species and current nature conservation planning policy is outlined in Appendix 1 of this report.

2 METHODOLOGY

The methodology used for this survey are in accordance with the Guidelines for Preliminary Ecological Appraisal (CIEEM 2017)¹.

2.1 Desk Study

A search for existing records of protected species, species of conservation concern and invasive non-native species was requested from the Sussex Biological Records Centre (SxBRC) within a radius of 2km of the site.

¹ CIEEM (2017) *Guidelines for Preliminary Ecological Appraisal, 2nd edition*. Chartered Institute of Ecology and Environmental Management, Winchester.



A search of on-line mapping resources was undertaken to identify the location of any features of potential ecological interest including ponds within 500m (relevant to great crested newts), watercourses (relevant to riparian mammals and crayfish) and connectivity to woodland, scrub, and hedgerow networks (relevant to bats, dormice) in the wider landscape around the site. The connectivity of the site to these features, buildings and other semi-natural habitats such as grassland and heathland are also relevant to bats, great crested newts and reptiles.

The MAGIC website resource (www.magic.gov.uk) was used to identify the location of designated sites for nature conservation and EPS licences granted in relation to the survey site.

2.2 Phase 1 Habitat Survey

A site walkover survey was undertaken on the 9th of February 2018, during which the habitats contained within the site were described and evaluated in accordance with standard Phase 1 Habitat Survey Methodology². The dominant species and indicators of important habitat types such as ancient woodland or unimproved grasslands, were recorded.

A repeat site walkover was undertaken on the 13th August 2020 to assess a new parcel of land to be included within the proposed development site and also assess Fields 1 to 5 to ascertain if any changes in habitat have occurred since 2018.

A Phase 1 Habitat Survey presents a standardised system for classifying and mapping wildlife habitats in all parts of Great Britain, including urban areas. The aim of Phase 1 Habitat Survey is to provide, relatively rapidly, a record of the vegetation and wildlife habitats present over large areas of countryside. The habitat classification is based principally on vegetation, augmented by reference to topographic and substrate features, particularly where vegetation is not the dominant component of the habitat.

Data is gathered through a site walk-over survey and use of on-line aerial photography to broadly categorise the habitats present using the Joint Nature Conservation Committee (JNCC) Phase 1 classifications. The results are presented as a map showing the distribution of habitat categories across the site. Target notes are used to describe specific features of biodiversity interest and record indicator species where appropriate. In addition to this, notable habitats, such as local and national Biodiversity Action Plan habitats are highlighted.

The Phase 1 Habitat Survey methodology is a recognised tool for initial scoping of potential ecological constraints and identifying potential impacts as part of the planning application process.

As part of the 'Extended' Phase 1 Habitat Survey, the site features were evaluated for their potential to support legally protected species and observations of any important plant communities, bird assemblages or other potentially valuable ecological features were recorded. Details of the

² JNCC (2010) Handbook for Phase 1 habitat survey: A technique for environmental audit. Joint Nature Conservation Committee, Peterborough.



preliminary survey methods for each legally protected species are given below.

2.3 Badgers

Habitats within the site and surrounding areas were broadly assessed for their potential to support badgers. Any signs of badger activity, for example setts, footprints, latrines, well-worn paths, foraging marks, were recorded.

Any limitations to the survey for badgers are set out in Section 3.12.

2.4 Bats

Bats can use a wide range of features including loft spaces, cavity walls, loose tiles, mortice joints and cracks/gaps in a variety of built structures. They can also be found in trees with holes, splits, cracks, cavities, ivy, and loose bark.

Trees, buildings, and other structures were broadly assessed for their potential to support roosting bats and further surveys are recommended as appropriate.

The potential for roosting bats for each feature, or group of features was assessed as either negligible, low, moderate, or high, in accordance with the Bat Conservation Trust Survey Guidelines (Collins, J.(ed.) (2016)³. Any evidence confirming the presence of bats that was found was clearly recorded including photos and samples (e.g. droppings) where appropriate. Further surveys are recommended where necessary.

2.5 Breeding Birds

The habitats contained within the site and adjacent areas were broadly assessed for their potential to support important bird species/assemblages, and breeding birds. Any birds identified during the site visit were recorded. Special attention was paid to notable species such as red-listed Birds of Conservation Concern (Eaton *et al.* 2015)⁴ and those species afforded special protection on Schedule 1 of the Wildlife and Countryside Act (1981). Further surveys are recommended as appropriate.

2.6 Dormice

The site was broadly assessed for its potential to support hazel dormouse. This included use of on-line mapping resources to assess the surrounding area for connectivity to large blocks of woodland, scrub and extensive hedgerow networks. Further surveys are recommended as appropriate in

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

⁴ Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, Leigh., Musgrove, A., Noble, D., Stroud, D., Gregory, R. (2015) *Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man*. British Birds 108, pp 708-746.



accordance with best practice guidance (Bright et al 2006)⁵.

2.7 Great Crested Newt

A desk study was undertaken to identify ponds within 500m of the site. Where access permission was granted, or ponds could be viewed from public roads or footpaths, the ponds were assessed for their potential to support great crested newts using the Habitat Suitability Index (H.S.I.) (Oldham et al 2000)⁶.

Further surveys are recommended as appropriate, in accordance with best practice guidance (English Nature 2001)⁷.

Any survey or access limitations are clearly set out in Section 3.12.

2.8 Reptiles

Habitats on the site were broadly assessed for their potential to support reptiles. Particular attention was paid to those features that provide suitable basking areas (e.g. south-facing slopes), hibernation sites (e.g. banks, walls, piles of rotting vegetation) and opportunities for foraging (rough grassland and scrub). The common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix helvetica* and adder *Vipera berus* are widespread species that can be found in any of these habitats, whereas smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis* have much more restricted and isolated populations on lowland heathland and sand dunes.

2.9 Riparian Wildlife

Any watercourses identified during the desk study or field survey were assessed for their suitability to support otter *Lutra lutra*, water vole *Arvicola terrestris* and American mink *Neovison vison*.

2.10 Other Notable Species

The site habitats were broadly assessed for their potential to support species of principle importance for nature conservation (Section 41 NERC Act 2006) and other notable species. This includes mammals such as harvest mouse, hedgehog, brown hare, and many bird species. The site was broadly assessed for its potential to support important invertebrate assemblages with specific attention paid to features such as standing dead-wood, wet flushes, bare earth banks and botanically rich areas.

⁵ Bright, P., Morris, P. and Mitchell-Jones, T. (2006) *The dormouse conservation handbook 2nd Ed.* English Nature, Peterborough.

⁶ Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000) Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). *Herpetological Journal* 10, 143-155.

⁷ English Nature (2001) *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough.



3 BASELINE CONDITIONS

3.1 Designated Sites

There are no designated sites within 2km of the proposed development site. However, there are numerous parcels of designated woodland surrounding the site including ancient woodland (red/orange hatched vertical lines), priority habitat of broadleaved woodland (dark green patches), assumed woodland (lime green horizontal lines), and wood pasture and parkland BAP priority habitat (the area outlined in green with grass like symbols).

There are no granted EPS licenses for mitigation projects within 1km of the site boundaries. The closest EPS licence to the site concerns brown long eared *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* in 2015 approximately 1.9km away from the nearest site boundary.

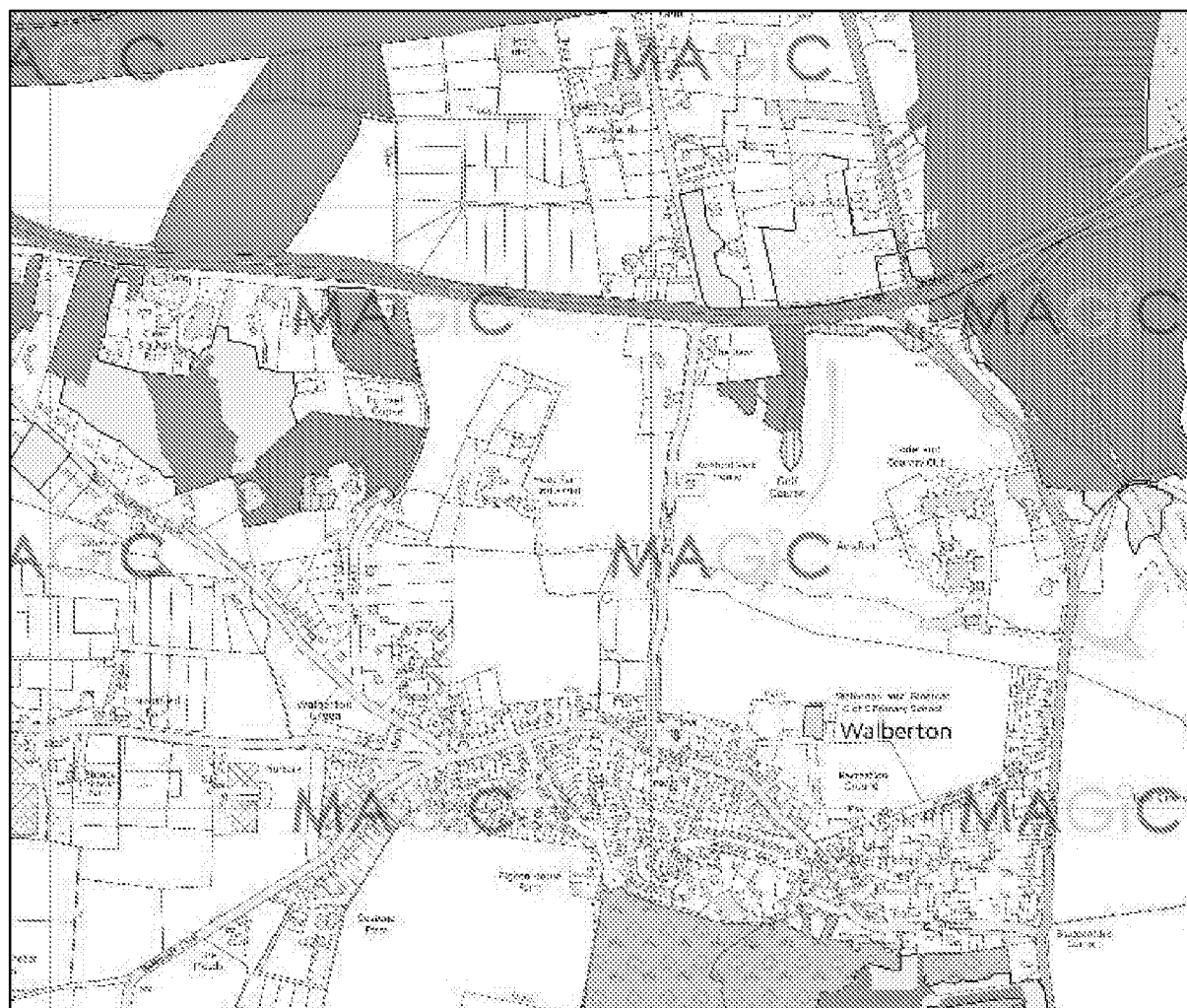


Figure 2. Designated sites within a radius of 2km of the application site. Images produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0).



3.2 Phase 1 Habitats

Table 1 below lists the Phase 1 Habitat categories found at the site, with target notes on specific features of interest and the general species composition. Note that detailed information on buildings and ponds with respect to bats and great crested newts are presented in the following sections. The Phase 1 Habitat Map for the site and key to the standard mapping symbols used are presented in Figure 3 and 4.

Table 1. The Phase 1 Habitats contained within Land West of Tye Lane, Walberton.

Habitat type	JNCC Code	Area (Ha) Length (meters)	Target note including general species composition
Scrub-dense/continuous	A2.1	0.20 Ha	The ditches and drains bordering Fields 1,2,3 and 4 are surrounded by dense bramble <i>Rubus fruticosus</i> and rose <i>Rosa</i> spp. with nettles <i>Urtica dioica</i> , hawthorn <i>Crataegus mopinogyna</i> and blackthorn <i>Prunus spinosa</i> in places.
Scrub-scattered	A2.2	0.07 Ha	There are patches of scattered bramble scrub along the southern boundary of Field 2 and within Field 4. The scrub comprises bramble, hawthorn, and blackthorn.
Improved grassland	B4	2.99 Ha	The grassland within Fields 2, 3, 4 and 5 is improved grassland with very little diversity and similar in composition. The grassland is heavily grazed and trampled in large areas of Field 4 and 5. Species comprise creeping buttercup <i>Ranunculus repens</i>, common mouse ear <i>Cerastium fontanum</i>, horsetail <i>Equisetum</i> spp., common sorrel <i>Rumex acetosa</i>, mosses, dandelion <i>Taraxacum</i> spp., daisy <i>Bellis perennis</i>, ribwort plantain <i>Plantago lanceolata</i>, perennial rye grass <i>Lolium perenne</i>. Field 1 (arable)- The grassland buffer strips running along the boundaries of the site consist of cleavers <i>Galium aparine</i>, nettle, bramble, docks <i>Rumex</i> spp., Yorkshire fog <i>Holcus lanatus</i>, cow parsnip <i>Heracleum</i> spp., ragwort <i>Jacobaea vulgaris</i>, soft rush <i>Juncus effusus</i>, lords and ladies <i>Arum maculatum</i>, herb robert <i>Geranium robertianum</i>, ivy and ground ivy <i>Glechoma hederacea</i>.
Cultivated/disturbed land-arable	J1.1	4.13 Ha	The main body of Field 1 comprises bare arable land with some grass beginning to grow.
Cultivated/disturbed land – amenity grassland	J1.2	0.12 Ha	A small residential garden comprising very short, mown amenity grassland comprising dandelion and daisy. Due to the recent hot weather, the grass was scorched (see Figure 10 and 11).
Buildings	J3.6	0.03 Ha	There are three stable buildings within the site used for storage and stabling horses.
Bare ground	J4	0.03 Ha	There are patches of bare ground surrounding the stable



			buildings within the site. There are piles of horse manure and a pile of old rubbish behind the stables. There is also a small area of bare ground along the eastern boundary where the existing entrance leads into the site from Tye Lane.
Broadleaved /Scattered trees	A3.1	34m	Scattered trees along the southern boundary of the residential garden comprising ornamental trees, <i>Cupressus</i> spp. and beech.
Intact hedge-species-poor	J2.1.2	635m	Field 1- The hedgerow along the southern boundary comprises row of large mature oak <i>Quercus</i> spp. trees in neighbouring garden but there are limbs over hanging into the site. There is holly <i>Ilex aquifolium</i>, privet <i>Ligustrum vulgare</i>, ash <i>Fraxinus excelsior</i> trees, <i>Cupressus</i> spp. and ivy <i>Hedera helix</i>. Field 2- The northern boundary of the Field 2 comprises holly, goat willow <i>Salix caprea</i>, dense hawthorn, bramble and elder <i>Sambucus nigra</i>. Field 3- The northern and eastern boundary of Field 3 comprise mainly hawthorn with Butcher's Broom <i>Ruscus aculeatus</i>, bramble, alder, privet, and ivy. There are some daffodils <i>Narcissus</i> spp., snow drops <i>Galanthus</i> spp. and mint <i>Mentha</i> spp. along the base of the hedgerow bordering the residential property. Field 4- The eastern boundary comprises mainly hawthorn and bramble. Field 5- The eastern boundary comprises hawthorn, bramble, holly, alder and ivy.
Defunct hedge-species-poor	J2.2.2	184m	Field 5- The western boundary consists of a stock fence with wire netting and the neighbouring residential tree line which includes a large mature oak, bamboo <i>Bambusa vulgaris</i>, ornamental garden shrubs, <i>Cupressus</i> spp., fig <i>Ficus carica</i> and hawthorn. The southern boundary of Field 5 comprises a fence line with ornamental garden shrubs, holly, brambles and ivy.
Hedge with trees-species-poor	J2.3.2	54m	Field 3- A section of the hedgerow along the southern boundary of Field 3 comprises wooden fence line with the wet ditch, bramble scrub, elder, mature ash tree and alder. Field 6 – the northern boundary of the residential garden comprises a fence line with holly, apple <i>Malus domestica</i>, pear <i>Pyrus</i> spp., willow, oak, hawthorn, rose, bamboo <i>Bambusoideae</i> spp., and eucalyptus <i>Eucalyptus globulus</i>. The western boundary of the residential garden comprises <i>Cupressus</i> spp., bamboo, bramble, and ornamental shrubs.



Hedge with trees-native species rich	J2.3.1	440m	Field 1- The hedgerow along the western boundary comprises <i>Cupressus spp.</i>, hawthorn, ivy, elder, bramble, honeysuckle, a row of three ivy covered ash, and larch <i>Larix decidua</i>. The hedgerow along the northern boundary of the site comprises dense bramble, ivy, oak, mainly hazel <i>Corylus avellana</i>, privet <i>Ligustrum Ovalifolium</i>, holly, honeysuckle <i>Lonicera spp.</i>, rose <i>spp.</i> and two mature oak trees. Field 2- The southern boundary comprises a barbed wire fence line with dense bramble, three oak trees, rose, honeysuckle, ash, elder, hawthorn, and field maple <i>Acer campestre</i>.
Fence	J2.4	127m	There are stock fence lines and electric fence lines within Fields 3, 4 and 5. There is a fence line surrounding all 5 fields.
Dry ditch	J2.6	369m 396m	There is a ditch running along the western boundary of Field 1 that is dry in places but also holds some water. There is fence line bordering the ditch with a residential area to the west of it. The ditch within Field 2 and 3 holds some water however it appears to be dry most of the time. The ditch is surrounded by dense bramble scrub. The ditches bordering Fields 1, 2, 3 and 4 hold water at certain times of the year with some areas of still water and some flowing water. There is dense scrub habitat surrounding the ditches. Field 6 – A dry ditch runs along the western boundary of residential garden.

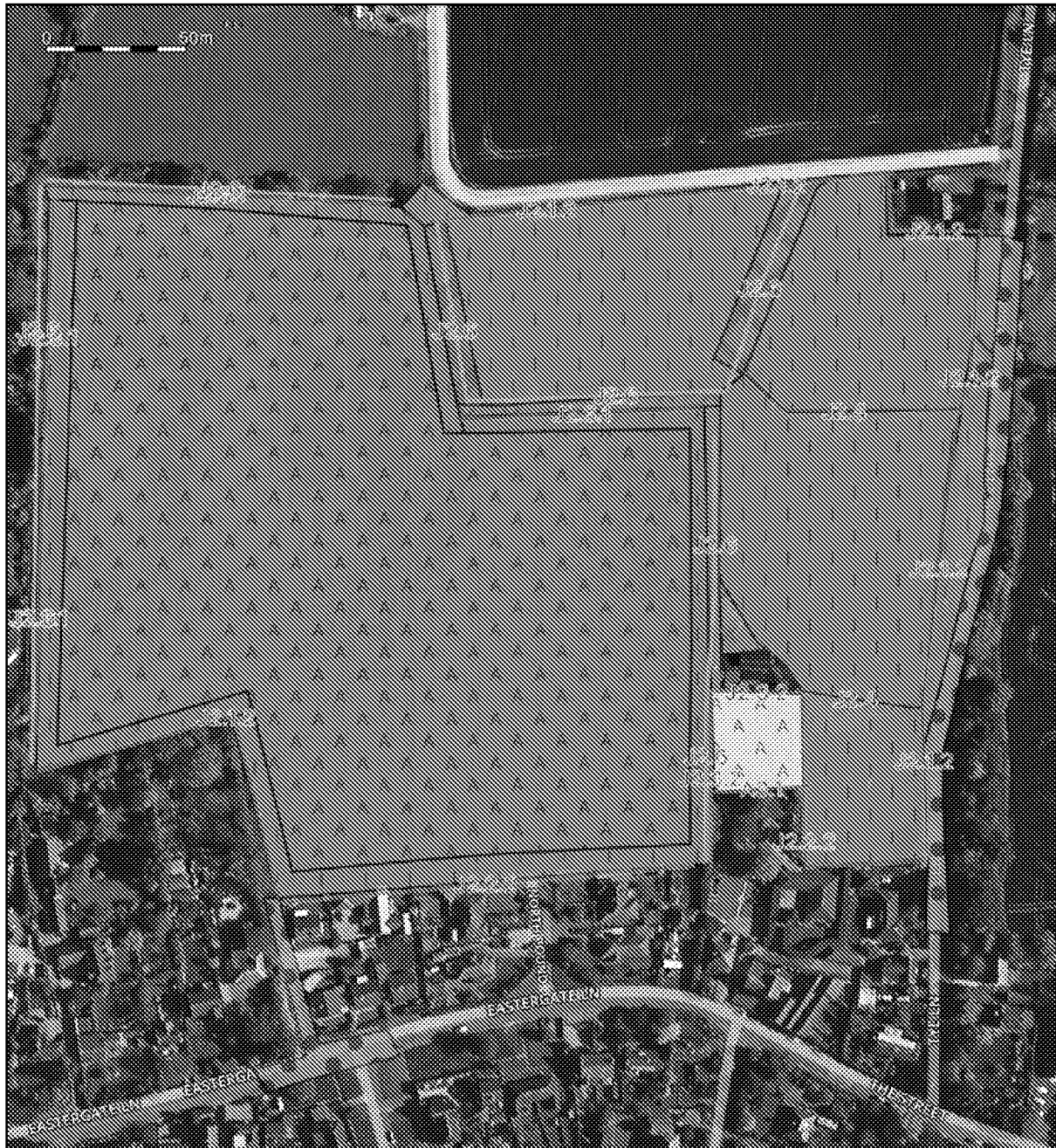


Figure 3. Phase 1 Habitat Map of Land West of Tye Lane, Walberton.

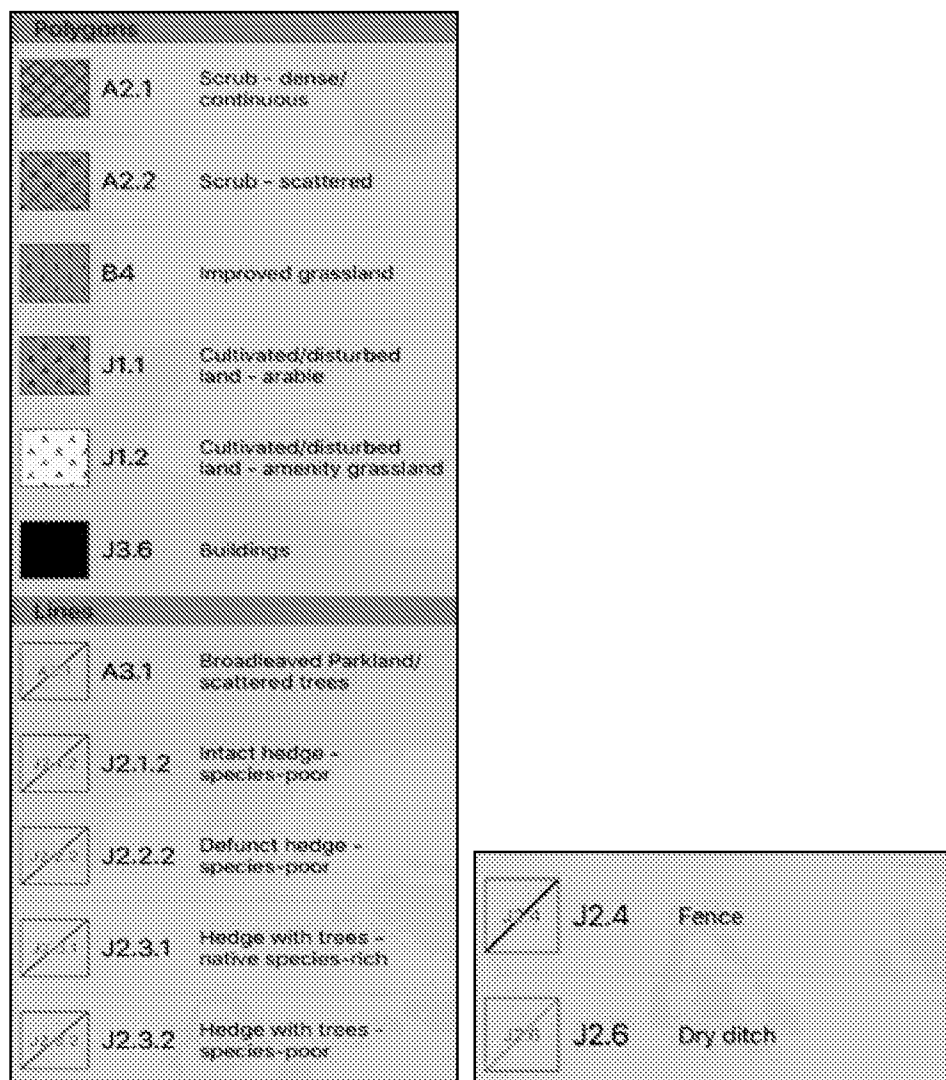


Figure 4. Key for Phase 1 Habitat map for Land West of Tye Lane, Walberton.



Figure 5. The dense bramble scrub surrounding the ditch within Fields 2 and 3.



Figure 6. Field 4 is grazed and used heavily by horses.



Figure 7. The arable field within the proposed development site.



Figure 8. Field 2 and Field 3 within the proposed development site.



Figure 9. Field 5 within the proposed development site.



Figure 10. The residential garden added to the scheme in August 2020 comprising mown amenity grassland and ornamental shrubs.



Figure 11. Looking south across the amenity grassland within the residential garden area added in August 2020.



3.3 Badgers

No signs of any badger activity were seen during the survey assessment, though there are habitats of value for this species within the site and surrounding landscape. It is likely that if any setts were situated within 30m of the site boundary, then some evidence of badger activity would have been observed.

Records of badgers are not provided by the Sussex Biodiversity Record Centre (SxBRC), due to the sensitive nature of this information.

3.4 Bats

There are a number of mature trees along the boundaries of the five fields along with the hedgerows and bramble, hawthorn and blackthorn scrub that can all potentially act as roosting, commuting routes and foraging habitats for bats in the area (Figure 12). The ditches and surrounding dense scrub offer valuable foraging habitat for this species. The trees along the boundaries of the fields offer low to moderate bat potential due to the presence of cracks, broken limbs, holes and dense ivy cover. There are three stable buildings within the site and they're described within Table 2 below.

Sussex Biodiversity Record Centre (SxBRC) provided 92 bat records in the search area comprising 10 identified species within the search area: serotine *Eptesicus serotinus* – 3 records, common pipistrelle *Pipistrellus pipistrellus* – 20 records, soprano pipistrelle *Pipistrellus pygmaeus* – 5 records, brown long-eared bat *Plecotus auritus* – 12 records, whiskered bat *Myotis mystacinus* – 1 record, Brandt's bat *Myotis brandtii* – 1 record, Natterer's bat *Myotis nattereri* – 2 records, Bechstein's bat *Myotis bechsteinii* – 1 record, Western Barbastelle bat *Barbastella barbastellus* – 26 records and unspecified bat records (12 records). The closest of the records was for a soprano pipistrelle in 2013, *Myotis* in 1986 and brown long-eared bat in 2012 approximately 474m from the site. A search was undertaken on Magic Map to identify any SSSI or SPA sites for bats within 5km of the proposed development site.

In addition, a consultation was made with the Bat Conservation and Research Unit (BatCRU), who undertook monitoring surveys of barbastelle bats within the area surrounding Slindon in 2015 and identified barbastelle flight lines approximately 200m to the north of the proposed development site in Walberton.

Table 2. Potential roost features for bats within Land West of Tye Lane, Walberton.

Buildings	Description of features	Assessment of potential
Stable Buildings 1 and 2	Two wooden buildings with wooden cladding externally and a corrugated metal roof. No visible gaps in the cladding identified internally or externally. The buildings are heavily cobwebbed inside and there are two windows within stable Building 1. Stable Building 2 does not have any windows; however, there are large open gaps between the wall and roof of this building. No bat droppings were identified internally or externally, and the wooden cladding is tightly fitted and does not provide potential roost features (see Figure 13 to 16)	Negligible Bat Potential
Building 3	A small wooden stable building similar to Buildings 1 and 2 with a	Negligible Bat



	window and weatherboarding with no visible gaps externally. The roof is covered with bitumen felt and there are no visible gaps externally or internally. No bat droppings were found anywhere on the building itself, externally. (see Figure 13 to 16)	Potential
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Figure 12. Two oak trees within the hedgerow along the northern boundary of Field 1 and Field 2 with suitable roosting features for bats.

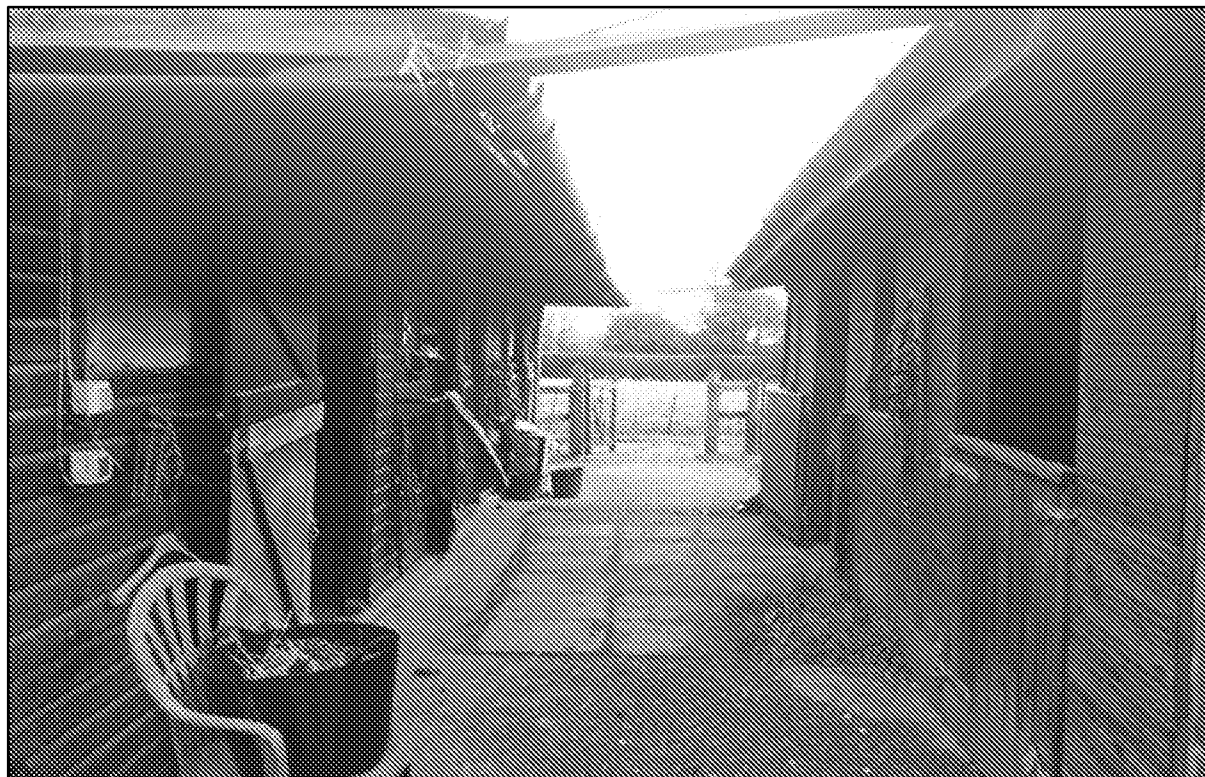


Figure 13. Stable Buildings 1 and 2 within the proposed development site.



Figure 14. The corrugated roof, window and cobwebs within Stable Building 1.



Figure 15. Building 3 within the site used for stabling horses.



Figure 16. The corrugated roof and large gap within part of Stable Building 2.



3.5 Breeding Birds

All of the scrub, saplings, semi-mature and occasional large mature trees have the potential to support a variety of common nesting birds. In addition, Field 1 is a large arable field and therefore there is potential for some species of ground nesting birds, particularly skylark *Alauda arvensis* and lapwing *Vanellus vanellus*.

SxBRC provided numerous bird records for the search area concerning a total of 160 species. Most of these species are relatively common and widespread, but the list includes 30 species of principal importance for conservation (S41 NERC Act 2007), and 26 species listed on Schedule 1 of the Wildlife and Countryside Act. In addition, 17 species are red listed on the Birds of Conservation Concern.

Records for skylark *Alauda arvensis*, nightingale *Luscinia megarhynchos*, barn owl *Tyto alba*, lapwing *Vanellus vanellus*, and nightjar *Caprimulgus europaeus* were identified within 2km of the proposed site in the biodiversity record search undertaken by SxBRC.

3.6 Dormice

The hedgerows bordering all four grazed fields and the arable field provide suitable habitat for dormice. The hedgerows consist of hazel, blackthorn, hawthorn, honeysuckle, with some bramble throughout which contribute to the suitability of the site for dormice. These hedgerows are ecologically well connected to suitable habitat within the surrounding landscape including the parcel of designated ancient woodland, Potwells Copse 132m from the nearest site boundary, which has a population of dormice as it is part of the National Dormice Monitoring Programme (NDMP). There is a parcel of ancient woodland within Avisford Golf Course that is 315m from the nearest site boundary and Wandleys Copse is 860m from the nearest site boundary and there is a record for a hibernating dormouse present in 2004.

SxBRC provided 110 dormouse records in the search area. The closest of these was at 265m from the boundary of the site located within Potwell Copse.

3.7 Great Crested Newts and Other Amphibians

Thirteen ponds were identified within 500m of the proposed site using aerial imagery and background mapping (see Figure 17). Table 3 shows the descriptions and location of each pond. The terrestrial habitat within all five fields is poor with the majority of the grassland heavily grazed and disturbed by horses. The grassland buffer strips surrounding Field 1, which is the arable field, may offer some suitable cover for foraging and commuting great crested newts. However, the majority of Field 1 is bare arable ground. Figure 18 and 19 show Ponds 1 and 14 which were visible during the site visit.

SxBRC provided 56 amphibian records in the search area. This included 4 records for great crested newt *Triturus cristatus*, 14 records for smooth newt *Lissotriton vulgaris*, 7 records for palmate newt *Lissotriton helvetica*, 23 records for common frog *Rana temporaria* and 9 records for common toad *Bufo bufo*. The closest great crested newt record is at 993m from the boundary of the site, dated in



2012.

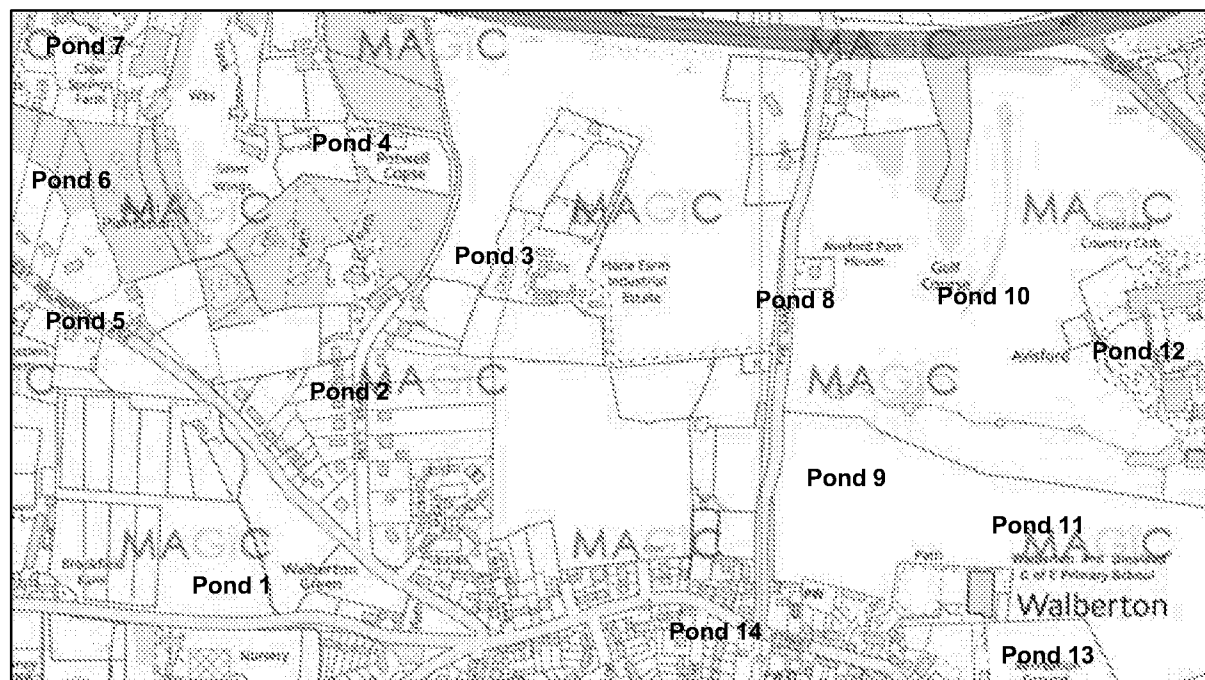


Figure 17. The location of the 13 ponds within 500m of Land West of Tye Lane, Walberton.

Table 3. Descriptions of the 13 ponds within 500m of the Land West of Tye Lane, Walberton.

Pond	NGR	Description	H.S.I value	Survey recommendations
1	SU965060	164m from the nearest site boundary. Village pond surrounded by hard standing and amenity grassland with a large water fowl population.	0.30 'poor'	No further action.
2	SU964065	This pond is 252m from the nearest site boundary and it was surveyed by the Ecology Co-op in April 2017. A HSI assessment and eDNA survey was carried out. There is a fish population within this pond.	0.45 'poor' eDNA - negative	No further action.
3	SU964065	241m from the nearest site boundary and this pond was surveyed by the Ecology Co-op in April 2017 with a HSI assessment. An eDNA assessment was not carried out due to low water levels. Pond is pipe-fed and used for water run-off from the residential building and associated gardens.	0.35 'poor'	No further action.
4	SU963065	316m from the nearest site boundary and contains a fish population. A HSI assessment and eDNA survey were carried out by the Ecology Co-op in April	0.59 'below average'	No further action.



		2017.		
5	SU963065	328m from the nearest site boundary and located within woodland habitat.	N/A	No further action.
6	SU963066	407m from the nearest site boundary and located on a flowing water course.	N/A	No further action.
7	SU962066	473m from the nearest site boundary and also located on the flowing water course.	N/A	No further action.
8	SU970063	Located 78m from the nearest site boundary and situated on a water course within Avisford golf course. Surveyed by EPR in April and May 2017.	N/A	No further action.
9	SU971063	Located 175m from the nearest site boundary and situated on a water course within the Avisford golf course. Surveyed by EPR in April and May 2017.	N/A	No further action.
10	SU972063	283m from the nearest site boundary on a water course within the Avisford golf course.	N/A	No further action.
11	SU973063	378m from the nearest site boundary and situated on a water course within the Avisford golf course. Surveyed by EPR in April and May 2017.	N/A	No further action.
12	SU974063	456m from the nearest site boundary and located on a water course within Avisford golf course. Surveyed by EPR in April and May 2017.	N/A	No further action.
13	SU971061	185m from the nearest site boundary and located within a residential area.	N/A	Obtain access and undertake HSI assessment.
14	SU969062	Just outside the red line boundary along the southern boundary of the site. A small garden pond with a high fish population and surrounded by short mown amenity grassland and concrete. A metal frame sits on top of the pond to prevent fish being predated by herons.	0.33 'poor'	No further action.



Figure 18. Pond 1 located within Walberton Village along West Walberton Lane.



Figure 19. Pond 14 along the southern boundary of the proposed development site.



3.8 Reptiles

The grassland within Fields 3, 4, and 5 are heavily grazed and disturbed by horses, which makes it unsuitable for foraging and commuting reptiles. The grassland within the buffer strips in Field 1 and within Field 2 may offer suitable habitat for a population of slow worms (see Figure 20 and 21). The bordering bramble scrub habitat provides additional cover for these species.

SxBRC provided 81 reptile records in the search area. The closest record for slow worm at 389m from the boundary of the site, dated in 1991, the closest record for grass snake is at 755m from the boundary of the site, the closest record for adder is at 510m from the site boundary and the closest record for common lizard is at 772m from the boundary of the site.



Figure 20. The grassland buffer strips surrounding the arable field, Field 1, with the scrub and hedgerows.



Figure 21. The heavily grazed and disturbed grassland within Fields 4.

3.9 Riparian Wildlife

There are a number of ditches with some running water within the site surrounded by dense hawthorn, blackthorn and brambles (Figure 20). No signs of water vole activity were identified with no burrows, latrines or feeding remains observed along this watercourse.

SxBRC provided 13 records of water vole in the search area. The closest of these was at 1.6km from the boundary of the site, dated in 2016.



Figure 20. The red arrow indicates the location of the wet ditch within the dense scrub in Field 2.

3.10 Invasive Non-native Species

No evidence of invasive non-native species was found during the walkover survey.

SxBRC provided 73 records of birds, 103 records of higher plants-flowering plants, 7 records of beetles, 1 record of moths, 1 record of mosses and 1 record of terrestrial mammal in the search area. The closest of these records was for cherry laurel *Prunus laurocerasus* was at 382m from the boundary of the site, dated 2008.

3.11 Other Notable Species

SxBRC identified 39 records for west European hedgehog *Erinaceus europaeus* between 1988 and 2017, 4 records for brown hare *Lepus europaeus* in 2000 and 2017 and 1 record in 2015 for polecat *Mustela putorius* within 2km of the nearest site boundary. There is some potential suitable habitat within the site to support these species. The closest of these records is for polecat in 2015 at 205m away from the nearest site boundary.

3.12 Survey Limitations

An initial site assessment such as this is only able to act like a 'snapshot' to record any flora or fauna that is present at the time of the survey. It is therefore possible that some species may not have been present during the survey but may be evident at other times of the year. For this reason, habitats are



assessed for their potential to support some species, even where no direct evidence (such as droppings) has been found.

3.12.1 Great Crested Newts

Access was not available for Ponds 8, 9, 10, 11, 12 and 13 at the time of survey.

3.12.2 Riparian Wildlife

The drains/ditches were difficult to fully assess due to the dense hawthorn, blackthorn and bramble scrub habitat that surrounds them.

4 ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES

4.1 Designated Sites

There are no designated sites within 2km of the proposed site. Therefore, the proposed site is outside of the zone of influence from all designated sites and there are no identified impacts as a result of the proposed development.

4.2 Habitats

The proposed development will result in the direct loss of improved grassland, hedgerows and scrub habitat. These habitats provide suitable habitat for a variety of species.

4.3 Badgers

No signs of badger activity were identified during the assessment and no badger setts are situated on or near of the proposed construction zone. No further mitigation for badgers is advised, however if any signs of digging by large animals is identified on or near to the site prior to construction, then an ecologist should be contacted for advice.

4.4 Bats

There are at least 8 trees within the proposed construction site that were identified to have features with low to moderate potential to support roosting bats. In accordance with Bat Conservation Trust Guidelines, it is recommended that a tree climbing assessment of these trees is made using an endoscope, where necessary, to investigate the suitability of these trees for roosting bats as well as looking for direct evidence of use. Emergence surveys may be necessary if the climbing assessment is inconclusive.

The hedgerows, arable field, scrub and ditches within the site are high quality foraging habitats and likely to be used by foraging and commuting bats as part of a wider resource across the landscape.

Records for the rare Bechstein *Myotis bechsteinii* and Western Barbastelle bats *Barbastella barbastellus* which are specially protected under Annex II of the Habitats Directive were identified



within the 2km biodiversity records search produced by SxBRC and barbastelle flight lines have been identified approximately 200m to the north of the proposed development site by Bat Conservation and Research Unit (BatCRU 2015).

Bat activity surveys are recommended to assess the use of the site by foraging and commuting bats and gain an understanding of the importance of the site to bats and potential impacts of the development proposals on the existing bat population using the site. In accordance with current survey guidelines, this should include a minimum of six walked transect surveys and three static logger assessments spread across the bat active season (April to mid-October). This survey effort is required due to the nearby records for Bechstein bats and Western Barbastelle bats, which are both Annex II species under the Habitats Directive.

As the site may be used by foraging and commuting bats, it is important that the potential for disturbance from artificial lights is considered. The proposed development should include an 'ecologically sensitive lighting scheme' in accordance with guidance produced by the Bat Conservation Trust (summarised in Appendix 3).

4.5 Breeding Birds

All the hedgerows, scrub and woodland habitat contained in the site has a high potential to support a variety of common nesting birds. It will be essential for any future development to consider the nesting bird season and any vegetation removal and/or building demolition should be timed outside of the nesting bird season (typically 1st March to 31st August), unless features are first searched by a suitably qualified ecologist and no active nests are found.

Field 1, the arable field, has the potential to support some declining bird species. It is important that the impact that this development might have upon declining bird species is fully understood. It is therefore recommended that a breeding bird survey is undertaken between the 1st of April and mid-June to determine the use of the site by breeding birds. It is recommended that a minimum of three survey visits are made due to the nature of some birds to establish nests at different times during the nesting season.

4.6 Dormice

The bramble, scrub, hedgerows and trees contained along the boundaries of the proposed site all have high potential to support dormice and the proposed development will result in direct loss of this habitat. Indirect impacts on this European Protected Species could also result from the development, such as increased predation risk by domestic cats and artificial light spill into the woodland.

It is recommended that a survey is undertaken in accordance with current best practice guidelines to determine presence/absence by dormice. The survey should include the boundary hedgerows and scrub habitat within Fields 1, 2, 3,4 and 5. Dormouse surveys involve fixing purpose-made nest tubes or boxes onto trees and checking for signs of occupation during the active period from April to October.



The woodland, hedgerow and scrub habitats should be retained wherever possible. Where direct impacts on habitat used by dormice cannot be avoided, a European Protected Species (EPS) licence would be necessary to allow the development to proceed legally. Mitigation and compensation measures would be required under such a licence, for example careful timing of activities and planting of native species hedgerows and scrub where appropriate.

As dormice are nocturnal, it is important that the potential for disturbance from artificial lights is considered, as for bats (see Appendix 3).

4.7 Great Crested Newts

Ponds 1, 2, 3, 4, 5, 6 and 7 can be ruled out as the Ecology Co-op carried out HSI assessments on Ponds 2,3 and 4 in March 2017 and undertook eDNA assessments on Ponds 2 and 4 in April 2017 (Planning Ref: WA-75-17/PL) for a separate planning application. Great crested newt presence was not identified within these ponds. Ponds 5,6 and 7 are more than 250m away from the nearest site boundary, situated within suitable habitat and they are located on a flowing watercourse and there may be fish presence. Therefore, this makes the ponds unsuitable to support great crested newts, which are predated on by fish and will only breed in still water.

Ponds 8, 9, 10, 11 and 12 within Avisford Golf Course can also be ruled out as Ecological Planning and Research (EPR) carried out full population assessments for great crested newts in April and May 2017 in relation to the proposed development at Land East of Tye Lane, Walberton, West Sussex (see Planning Ref: WA/44/17/OUT). Great crested newts were not identified within any of the five ponds, however palmate and smooth newts were identified within the ponds. Therefore, no further surveys are required for these ponds.

In August 2020, a HSI assessment was undertaken on Pond 14 during a repeat site walkover of the Land West of Tye Lane, Walberton and an assessment of a new parcel of land added to the original scheme. Pond 14 is a small garden pond located in a residential garden comprising very short mown amenity grassland and ornamental shrubs. Pond 14 has concrete sides and a metal frame covering the surface of the pond in order to prevent the large population of fish from predation by herons. The results of the HSI assessment indicate that the pond has 'poor' suitability to support great crested newts and therefore no further surveys are required.

An appropriate approach for Pond 13 would be to carry out a Habitat Suitability Index (HSI) assessment to gauge its current suitability to support a population of great crested newts. If the pond is deemed suitable then an eDNA assessment for the presence of great crested newt DNA will be carried out to determine if great crested newts are present and whether to conduct population size class surveys on the pond. This survey will involve one daytime visit to collect water samples from the pond between 15 April and 30 June. Biggs J, *et al.* 2014 'Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt *Triturus cristatus* environmental DNA.' If great crested newt DNA is identified, then a population assessment will be required in order for a European Protected Species (EPS) Licence to be granted by Natural England to permit any development at the site.

The population survey would follow best practice guidelines as described within Natural England's



'Great Crested Newt Mitigation Guidelines'. In accordance with these guidelines, six surveys are carried out on evenings when the ambient temperature is not less than 5 degrees Celsius between mid-March and mid-June with three surveys being carried out between mid-April and mid-May. This timing ensures that surveys are carried out when newts are most likely to be breeding, thus maximising the potential to identify newt presence and establish a population.

In the event that great crested newts are found to be present, a suitable mitigation strategy would need to be produced that outlines how the newt population will be protected and how the development would provide enhancements to promote populations growth.

4.8 Reptiles

The proposed development would result in the loss of suitable reptile habitat at the site. This is highly likely to impact on reptiles and a survey is therefore recommended for this site. The standard approach to reptile presence/absence surveys require a minimum of eight site visits, first to set out artificial refuges ('reptile mats'), followed by seven survey visits. The optimal months for survey are April, May and September but they can be undertaken at any time from April to October, provided weather conditions are suitable.

If presence of reptiles is confirmed through such a survey, a reptile mitigation strategy is likely to be required by the planning authority. This would probably involve the capture and translocation of reptiles to a suitable receptor site nearby.

4.9 Conclusions

The proposed development would result in the loss of improved grassland, sections of hedgerow and scrub along with amenity grassland and some ornamental shrubs. However, there are opportunities to enhance, mitigate and compensate for this development for example habitat creation and pond creation. Bat roosting and bird nesting habitat can be created through the installation of permanent roosting/nesting features into the new residential dwellings. The boundaries of the site can be enhanced by native planting schemes which could act as a buffer between the existing residential areas and the proposed development.

A Mitigation and Enhancement Report should be produced following the completion of all of the required Phase 2 surveys described above and input into the design of the site to minimize ecological impacts may be necessary.

A Biodiversity Impact Calculation (using the DEFRA Metric) will be required to demonstrate net gain in biodiversity and demonstrate compliance with the NPFF. With the retention of high value habitats and the creation of new habitats, for example wildflower tussocky grassland, hedgerows and water bodies including SuDS ponds and swales, it is considered that a residential property within the site could potentially result in a net-gain in biodiversity.

If any protected species are found during the proposed work, work should be stopped



immediately, and an ecologist must be contacted for advice.

Should you need any further advice on the information provided above, please do not hesitate to contact The Ecology Co-op, info@ecologyco-op.co.uk, www.ecologyco-op.co.uk, Office: 01798 861800.



APPENDIX 1 – Wildlife Legislation and National Planning Policy

Introduction

The following text is intended for general guidance only and does not constitute comprehensive professional legal advice. It provides a summary of the current legal protection afforded to wildlife in general and certain species. It includes current national planning policy relevant to nature conservation.

The ‘Birds Directive’, ‘Habitats Directive’ and ‘Natura 2000 Sites’.

The Council Directive 79/409/EEC on the Conservation of Wild Birds (“the Birds Directive”) sets a framework for the protection of wild birds. Under the directive, several provisions are made including the designation and protection of ‘Special Protection Areas’ (SPAs) – areas which support important bird populations, and the legal protection of rare or vulnerable species.

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the “Habitats Directive”) directs member states of the EU to take measures to maintain favourable conservation status of important habitats and species. This requires the designation of a series of sites which contain important populations of species listed on Annex II of the directive (for example Bechstein’s bat *Myotis bechsteinii*, Barbastelle bat *Barbastella barbastellus* and white-clawed crayfish *Austropotamobius pallipes*. Together with ‘Special Areas of Conservation’ (SPAs), designated under the Birds Directive, SACs form a network across Europe of protected areas known as the ‘Natura 2000 sites’.

Annex IV lists species in need of more strict protection, these are known as “European Protected Species (EPS)”. All bat species, common dormice *Muscardinus avellana*, otter *Lutra lutra* and great crested newts *Triturus cristatus* are examples of EPS that are regularly encountered during development projects.

The ‘Habitats Regulations’

The Conservation of Habitats and Species Regulations 2010 (the “Habitats Regulations”) is the principle means of transposing the Habitats Directive and the Birds Directive, and updates the Conservation (Natural Habitats, &c.) Regulations 1994 (“the 1994 regulations”) in England and Wales.

‘Natura 2000’ sites receive the highest level of protection under this regulation which requires that any activity within the zone of influence of these sites would be subject to a Habitats Regulations Assessment (HRA) by the competent authority (e.g. planning authority), leading to an Appropriate Assessment (AA) in cases where ‘likely significant effects on the integrity of the site are identified.

For European Protected Species, Regulation 41 makes it a criminal offence to;

- Deliberately capture, injure or kill any such animal;
- Deliberately disturb wild animals of such species;
- Deliberately take or destroy their eggs (where relevant);
- Damage or destroy a *breeding or resting place* of such an animal;
- Possess, control, sell or exchange any live or dead animal or plant, of such species;
- Deliberately pick, collect, cut, uproot or destroy a wild plant of such species.



The Habitats Directive and Habitats Regulations provide for the derogation from these prohibitions for specific reasons provided certain conditions are met. An EPS licensing regime allows operations that would otherwise be unlawful acts to be carried out lawfully. Natural England is the licensing Authority and, in order to grant a licence, ensures that three statutory conditions (sometimes referred to as the 'three derogation tests') are met:

- A licence can be granted for the purposes of "preserving public health or safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment" (Regulation 53 (2) (e)).
- A licence can be granted if "there are no satisfactory alternatives" to the proposed action.
- A licence shall not be granted unless 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.

Wildlife and Countryside Act (1981) as amended.

This remains one of the most important pieces of wildlife legislation in the UK. There are various schedules to the Act protecting birds (Schedule 1), other animals including insects (Schedule 5), plants (Schedule 8), and control of invasive non-native species (Schedule 9).

Under the Wildlife and Countryside Act (WCA) 1981, all wild birds (with the exception of those listed on Schedule 2), their eggs and nests are protected by law and it is an offence to:

- Take, damage or destroy the nest of any wild bird while it is in use or being built.
- Take or destroy the egg of any wild bird.
- Disturb any bird listed on Schedule 1, while it is nest building, or at a nest with eggs or young, or disturb the dependant young of any such bird.

Schedule 5 lists all non-avian animals receiving protection to a varied degree. At its strongest, the Act makes it an offence to intentionally kill, injure or take any wild animal listed on Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturb animals while occupying such places. Examples of species with *full protection* include all EPS, common reptile species, water vole *Arvicola amphibius*, white-clawed crayfish *Austropotamobius pallipes* and Roman snail *Helix pomatia*. Other species are protected from sale, barter or exchange only, such as white letter hairstreak *Satyrrium w-album*.

The Act makes it an offence to intentionally pick, uproot or destroy any plant or seed, and sell or possess any plant listed on Schedule 8. It is also an offence to intentionally uproot any wild plant not listed on Schedule 8 unless authorised [by the land owner]. Species on Schedules 5 and 8 are reviewed every 5 years when species can be added or removed.

Measures for the prevention of spreading non-native species which may be detrimental to native wildlife is included in the Act, which prohibits the release of animals or planting of plants into the wild of species listed on Schedule 9 (for example Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandifera*, New Zealand Pygmyweed *Crassula helmsii*).

The Wildlife and Countryside Act 1981 (as amended) also prohibits certain inhumane methods of traps and devices for the capture or killing of wild animals and certain additional methods such as fixed trap, poisoning with gas or smoke, or spot-lighting with vehicles for killing species listed on Schedule 6 of the Act (this includes all bat species, badger, otter, polecat, dormice, hedgehog and red squirrel).



Natural Environment and Rural Communities (NERC) Act (2006)

The NERC Act (2006) created the statutory nature conservation body Natural England, and places a statutory duty on all public bodies, including planning authorities, under Section 40, to take, or promote the taking by others, steps to further the conservation of *habitats and species of principal importance for the conservation of biodiversity* in England (commonly referred to as the 'Biodiversity Duty'). This duty extends to all public bodies the biodiversity duty of Section 74 of the Countryside and Rights of Way (CROW) Act 2000, which placed a duty only on Government and Ministers. Section 41 of the NERC Act lists the habitats and species of principle importance. This includes a wide range of species from mosses, vascular plants, invertebrates through to mammals and birds. It originates from the priority species listed under the UK Biodiversity Action Plan (UK BAP) with some omissions and additions.

Protection of Badgers Act (1992)

The Badger *Meles meles* is afforded specific legal protection in Britain under the Protection of Badgers Act (1992), and Schedule 6 of the Wildlife and Countryside Act 1981 (as amended) (see above).

Under this legislation, it is a criminal offence to:

- intentionally kill, injure, take, possess, or cruelly ill-treat, a Badger, or to attempt to do so;
- interfere with a sett, by damaging or destroying it;
- to obstruct access to, or any entrance of, a Badger sett; or
- to disturb a Badger when it is occupying a sett.

A licence may be obtained from Natural England to permit certain prohibited actions for a number of defined reasons including interference of a sett for the purpose of development, provided that a certain number of conditions are met. Note that licenses are not normally granted for works affecting badgers between the end of November and the start of July.

National Planning Policy Framework

The National Planning Policy Framework (NPPF 2012) sets out the Government's view on how planners should balance nature conservation with development and helps ensure that Government meets its biodiversity commitments with regard to the operation of the planning system.

The NPPF states that the wider benefits of an ecosystem should be recognised, and the presence of a protected species is a material consideration for a development proposal (Circular 06/2005, 2005).

In accordance with the NPPF, it is important that developments should contribute to and enhance the natural and local environment by:

- Minimising impacts on existing biodiversity and habitats,
- Providing net gains in biodiversity and habitats, wherever possible,
- establishing coherent ecological networks that are more resilient to current and future pressures.

UK Post-2010 Biodiversity Framework

The UK Biodiversity Action Plan (UK BAP), first published in 1994, was the UK's response to the commitments of the Rio Convention on Biological Diversity (1992) until 2010, when the UK BAP was



replaced by the UK Post-2010 Biodiversity Framework. This framework covers the period 2011 to 2020 and forms the UK government's response to the new strategic plan of the United Nations Convention on Biodiversity (CBD) published in 2010. This promotes a focus on individual countries delivering target for protection for biodiversity through their own strategies.

The most recent biodiversity strategy for England, 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services' was published by Defra (2011), and a progress update was provided in July 2013 (Defra 2013).

'Biodiversity 2020' builds on the Natural Environment White Paper for England – 'The Natural Choice', published on 7 June 2011, and sets out the strategic direction for biodiversity policy for the next decade.

Biodiversity 2020 deliberately avoids setting specific targets and actions for local areas and species because the Government believes that local people and organisations are best placed to decide how to implement the strategy in the most appropriate way for their local area or situation.

Birds of Conservation Concern (BoCC)

In 1996, the UK's leading non-governmental bird conservation organisations listed the conservation status of all bird species in the UK against a series of criteria relating to their population size, trends and relative importance to global conservation. The lists, known as the 'Red', 'Amber' and 'Green' lists (in order of decreasing concern) are used to inform key conservation policy and decisions. The lists are reviewed every 5 years and are a useful reference for determining the current importance of a particular site for birds. The most recent review was undertaken in 2015 (Eaton et al, 2015), which provides an up to date assessment of the conservation status of birds in the UK.

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APPENDIX 2 – Great Crested Newt ‘Habitat Suitability Index’ Values

Table 1. HSI calculation for ponds assessed during the survey.

	Pond 1		Pond 2		Pond 3	
NGR	SU 965060		SU 964065		SU 964065	
SI attribute	SI value	Notes	SI Value	Notes	SI Value	Notes
Location	1.00	SE England	1.00	SE England	1.00	SE England
Pond area	0.90	450m ²	0.48	240m ²	0.40	200m ²
Pond drying	1.00	Rarely	0.90	Never	0.10	Frequently
Water quality	0.33	Poor	0.67	Moderate	0.33	Poor
Shade cover	1.00	5%	1.00	0%	1.00	0%
Water-fowl	0.01	Major	0.67	Minor	0.67	Minor
Fish presence	0.67	possible	0.01	Major	1.00	Absent
No. ponds	1.00	12	0.84	6	0.84	6
Terrestrial habitat	0.01	isolated	0.67	Moderate	0.67	Moderate
Macrophytes	0.32	1%	0.31	0%	1.00	80%
H.S.I. value	0.30	‘Poor’ suitability	0.45	‘poor’	0.59	‘below average’

	Pond 4		Pond 5		Pond 14	
NGR	SU 963065		SU 963065		SU 969062	
SI attribute	SI value	Notes	SI Value	Notes	SI Value	Notes
Location	1.00	SE England	1.00	SE England	1.00	SE England
Pond area	0.97	900m ²	0.48	1344m ²	0.05	10m ²
Pond drying	0.90	Never	0.90	Never	0.9	Never
Water quality	0.67	Moderate	0.67	Poor	0.67	Moderate
Shade cover	1.00	10%	1.00	100%	1.00	5%
Water-fowl	0.01	Major	0.67	Minor	0.67	Minor
Fish presence	0.01	Major	0.01	Possible	0	Major
No. ponds	1.00	6	0.84	6	1.00	>12
Terrestrial habitat	0.01	isolated	0.67	Moderate	0.33	Poor
Macrophytes	0.32	1%	0.31	0%	0.3	>1%
H.S.I. value	0.35	‘poor’	0.45	‘below average’	0.33	‘poor’



APPENDIX 3 – Reducing Impacts of Artificial Light

Bright external lighting can have a detrimental impact upon foraging and commuting bat flight paths, but more importantly can also cause bats to remain in their roosts for longer. Artificial lighting can also cause significant impacts on other nocturnal species, most notably moths and other nocturnal insects. It can also result in disruption of the circadian rhythms of birds, reducing their fitness. Guidelines issued by the Bat Conservation Trust⁸ should be considered while designing the lighting scheme. This includes the following measures:

Do not:

- provide excessive lighting. Use only the minimum amount of light needed for the task.
- directly illuminate bat roosts or important areas for nesting birds

Avoid:

- installing lighting in ecologically sensitive areas such as: near ponds, lakes, rivers, areas of high conservation value; sites supporting particularly light-sensitive species of conservation significance (e.g. glow worms, rare moths, slow-flying bats) and habitat used by protected species.
- using reflective surfaces under lights.

Do:

- consider employing a competent lighting designer who will apply the principals of providing the right light, in the right place, at the right time and controlled by the right system.
- minimise the spread of light to at, or near horizontal and ensure that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required.
- consider the height of lighting columns. It should be noted that a lower mounting height is not always better. A lower mounting height can create more light-spill or require more columns. Column height should be carefully considered to balance task and mitigation measures.
- consider no lighting solutions where possible such as white lining, good signage, and LED cats eyes. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times.
- use temporary close-boarded fencing until vegetation matures, to shield sensitive areas from lighting.
- limit the times that lights are on to provide some dark periods. The task being lit often varies, for example roads are less used after 23.00hrs and car parks are empty. A lighting designer can vary the lighting levels as the use of the area changes reducing lighting levels or perhaps even switching installations off after certain times. This use of adaptive lighting can tailor the installation to suit human health and safety as well as wildlife needs.

⁸ Bat Conservation Trust (2014) Artificial Lighting and Wildlife - Interim Guidance: Recommendations to help minimise the impact artificial lighting. Available at: http://www.bats.org.uk/pages/bats_and_lighting.html



Further reading:

Buglife (2011) *A review of the impact of artificial light on invertebrates*.

Royal Commission on Environmental Pollution (2009) *Artificial light in the environment*. HMSO, London. Available at: <https://www.gov.uk/government/publications/artificial-light-in-the-environment>

Rich, C., Longcore, T., Eds. (2005) *Ecological Consequences of Artificial Night Lighting*. Island Press. ISBN 9781559631297.

CPRE (2014) *Shedding Light: A survey of local authority approaches to lighting in England*. Available at: <http://www.cpre.org.uk/resources/countryside/dark-skies/item/3608-shedding-light>

Planning Practice Guidance guidance (2014) When is light pollution relevant to planning? Available at: <https://www.gov.uk/guidance/light-pollution>

Institution of Lighting Professionals (2011) *Guidance Notes for the Reduction of Obtrusive Light* GN01:2011. Available at: <https://www.theilp.org.uk/resources/free-resources/>

End.