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Preliminary Ecological Appraisal, Phase 1 Habitat Assessment

**Land at Sunny Corner, Copse Lane,
Walberton**

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11th September 2017

Project No: 2255

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Report Summary

- 1. A combined Phase 1 Habitat Survey and Preliminary Ecological Appraisal was undertaken for land at Sunny Corner, Walberton on the 6th of March 2017. This assessment was undertaken to evaluate the site for the potential of protected species and or valuable habitats at the request of Mr and Mrs Holden, who wish to make a planning application to build 9 residential properties on this land. Further to this a repeat botanical assessment was carried out by Paul Whitby and assisted by Briony Hill on the 28th of June 2017 to more accurately account for annual and herbaceous plants that may have been missed during the initial Phase 1 and this report has been updated with the results.**
- 2. This assessment was undertaken by Jess Burkitt a Graduate member of the Chartered Institute for Ecology and Environmental Management (CIEEM).**
- 3. The site is made up of a field with species poor semi-improved grassland, hedgerows with trees, dense bramble and hawthorn scrub and a stream running along the western boundary.**
- 4. The site has potential to support the following species: reptiles, nesting birds, dormice great crested newts and bats. Further surveys for these species have been outlined in Section 4.**
- 5. The findings of the protected species surveys outlined in Section 4 must be used to inform detailed mitigation and compensation measures to ensure that negative impacts upon protected and notable species and habitats are avoided.**
- 6. In addition, if any protected species are found during the proposed work, an ecologist must be contacted immediately for advice.**

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1 INTRODUCTION

1.1 Purpose of the Report

This report gives details of a combined preliminary ecological appraisal and Phase 1 Habitat Survey for the potential or likely absence of protected species and or valuable habitats to be present at Land at Sunny Corner, Walberton, West Sussex. The grid reference for the site centre is SU 963064.

Where necessary appropriate mitigation measures considered necessary to protect wildlife as well as compensate for any potential harm to habitats of value that could take place are outlined.

This survey assessment was carried out by Jess Burkitt, a Graduate member of the Chartered Institute for Ecology and Environmental Management (CIEEM).

This survey and report was carried out and produced at the request of Mr and Mrs Holden.

1.2 Background

The Ecology Co-operation was commissioned to assess the current ecological value of Land at The Sunny Corner, Walberton, which is situated on Copse Lane, in Walberton, West Sussex (see Figure 1). The site is made up of a large field of species poor grassland with species-rich and species-poor hedgerows with trees surrounding the site. There are dense patches of scrub along the boundaries of the site with a stream running along the western boundary. It is proposed to build 9 residential properties within the shite shown in Figure 1.



Figure 1. An aerial image showing the location of the site. The approximate site boundary is outlined in red.



1.3 Legal Protection of Protected Species

Legal protection applying to relevant bird, mammal, herpetofauna and invertebrate species is detailed in Appendix 1 of this report.

2 METHODOLOGY

2.1 Phase 1 Habitat Survey

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 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 habitat¹.

Data is gathered through walking over a site and physically describing the dominating habitats present taking note of species compositions of these habitats and making target notes for any important features identified. In addition to this, notable habitats, such as local and national Biodiversity Action Plan habitats are described where appropriate.

Finally, the results are presented as a map which is provided within this report to show all of the habitats within the site proposed for development that could be potentially affected through the construction process.

2.2 Preliminary Ecological Appraisal

A preliminary ecological appraisal was carried out on 6th March 2017 to evaluate the site for its potential to support EU and UK protected species. Taking into consideration the geographical region and habitat type, species that could be encountered are:

- Badger (*Meles meles*)
- Bats;
- Nesting birds;
- Great crested newt (*Triturus cristatus*);
- Reptiles;
- Hazel dormouse (*Muscardinus avellanarius*);
- Water voles (*Arvicola amphibius*)

In addition, observations of any important plant communities or other valuable ecological features will have been recorded and detailed.

The methods developed by CIEEM and the following authors were used in the assessment of either suitable habitat to support the above species or taxonomic groups or in some cases direct evidence

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



that the species were present²³⁴⁵⁶⁷. Details of initial survey method for each species are given below. Following the appraisal of this site it was decided that a biodiversity record search was required for all protected and species within a 2km radius of the site. These were obtained on 13/03/17 from the Sussex Biodiversity Records Centre.

2.2.1 Badger

An initial assessment was carried out to identify areas that might be used by badgers. Signs of Badgers including setts, incidental foraging signs, runs and latrines, are recorded if encountered during the survey.

2.2.2 Bats

Trees, buildings, and other structures were assessed for the potential to support roosting bats. Bats can use a variety of roost areas including trees with holes, splits, cracks, cavities, Ivy and loose bark as well as a variety of roosting areas within buildings.

A detailed survey was carried out looking for any evidence indicating the presence of bats using buildings or trees, such as rub marks, staining or droppings inside or outside any potential roost sites.

If any definite signs of bats or other evidence had been found (such as actual sightings, droppings, urine stains, odour, scratch marks, grease stains and feeding remains), they would have been recorded.

2.2.3 Breeding Bird Habitat

Habitats were assessed for their suitability for nesting birds. This could include ground nesting species, such as skylark (*Alauda arvensis*) and lapwing (*Vanellus vanellus*) or birds that favour urban environments. Where buildings were present, possible use by starlings (*Sturnus vulgaris*) house sparrow (*Passer domesticus*), or barn owls (*Tyto alba*).

2.2.4 Dormice

The site was assessed for its value for dormice, including woodland and suitable hedgerows, which form either a continuous or connected area of habitat at least 2 hectares in area. Particular note was made of the presence of trees which are valuable for foraging dormice, particularly hazel. If possible a nut search to look for evidence of nuts that have been chewed by dormice would also be made.

² Bright, B., Morris, P., Mitchell-Jones, A.J. and Mitchell-Jones, T (1997) *The Dormouse Conservation Handbook*. English Nature.

³ English Nature (2001) *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough.

⁴ Harris, S, Cresswell, P. and Jefferies, D. (1989) *Surveying Badgers*. Mammal Society.

⁵ 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.

⁶ Collins, J.(ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.

⁷ CIEEM (2013) *Guidelines for Preliminary Ecological Appraisal*



2.2.5 Great Crested Newt

Initial surveys centre on identifying suitable habitat. If there are ponds or wet ditches that are considered to be suitable breeding habitats for great crested newt within 500 meters that are not isolated from the site by unsuitable habitat or physical barriers, then this species could be using terrestrial habitat on the site.

2.2.6 Reptiles

The site was assessed for reptile's with the following three species widespread; common lizard (*Zootoca vivipara*), slow-worm (*Anguis fragilis*) and grass snake (*Natrix natrix*), with adder (*Vipera berus*) having a more restricted distribution and smooth snake (*Coronella austriaca*) and sand lizards (*Lacerta agilis*) having restricted and isolated populations. Particular attention 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).

2.2.7 Water Voles

Assessment of habitat suitability of water courses and vegetation bordering them for this species. In addition, water course can be search for evidence of water vole activity in the form of latrines, runs, burrows and feeding stations.

2.2.8 Habitat evaluation

Whilst a Phase 1 Habitat survey provides a habitat overview and not a detailed habitat assessment, this survey is intended to identify habitats of value (or potential value, where a survey is not conducted between April and September) and prescribe where necessary a Phase 2 botanical assessment. Particular measures that may be needed in order to protect habitat of value may also be outlined where necessary.

A repeat botanical assessment was undertaken on land at Sunny Corner on the 28th June 2017 by Paul Whitby, a Full member of the Chartered Institute for Ecology and Environmental Management (CIEEM) and a Chartered Ecologist (CEcol) and was assisted by Briony Hill, a graduate member of CIEEM.

A walkover was carried out across the entire site. All plants were recorded and their relative abundance was scored using the DAFOR scale: D= Dominant, A= Abundant, F= Frequent, O= Occasional, R= Rare. The plant list for the site can be viewed in Section 5.

3 RESULTS

3.1 Phase 1 Habitat Survey/site Context

The majority of the site consists of species poor grassland with both species poor and species rich hedgerows with trees surrounding the site, and a stream running along the western boundary.

Whilst this survey only details the habitats present within the sites boundaries, some adjacent habitats have also been described below.



Table 1. The habitats mapped at Land at Sunny Corner, Walberton.

Habitat type	JNCC Code	Area(Ha)/ Length (meters)	Feature description, including general species composition
Scrub-dense/continuous	A2.1	0.16 Ha	There are large, dense patches of scrub running along the northern, southern and western boundaries of the site. The scrub is mainly made up of bramble (<i>Rubus fruticosus</i>), common nettles (<i>Urtica dioica</i>) and hawthorn (<i>Crataegus monogyna</i>).
Bare ground	J4	0.12 Ha	These areas of grassland have been cleared leaving bare earth with some ivy (<i>Hedera helix</i>), bramble, cleavers (<i>Galium aparine</i>), daffodils (<i>Narcissus</i>), and creeping buttercup (<i>Ranunculus repens</i>).
Poor semi-improved grassland	B6	0.61 Ha	The grassland across the site is species poor semi-improved, with little diversity. Species identified include common sorrel (<i>Rumex acetosa</i>), Yorkshire fog (<i>Holcus lanatus</i>), common nettles, creeping buttercup, ground ivy (<i>Glechoma hederacea</i>), cleavers, common thistle (<i>Cirsium vulgare</i>), ribwort plantain (<i>Plantago lanceolata</i>), and docks (<i>Rumex spp.</i>).
Running water-mesotrophic	G2.2		There is a stream running along the western boundary of the site. The watercourse is 1/1.5m wide and quite slow-flowing. The stream lacks notable vegetation, being largely bare along its banks. Some harts tongue (<i>Asplenium scolopendrium</i>) is however present.
Hedge with trees-species-rich	J2.3.1		The hedgerow bordering the site to the north consists of goat willow (<i>Salix caprea</i>), dense bramble and nettle scrub, alder (<i>Alnus glutinosa</i>), hawthorn, rose (<i>Rosa spp.</i>), ash (<i>Fraxinus excelsior</i>), oak (<i>Quercus spp.</i>), silver birch (<i>Betula pendula</i>), cherry laurel (<i>Prunus laurocerasus</i>), holly (<i>Ilex aquifolium</i>), bracken (<i>Pteridium spp.</i>), and hazel (<i>Corylus avellana</i>).
Hedge with trees-species-poor	J2.3.2		The southern boundary of the site consists of ash, hawthorn, holly, beech (<i>Fagus sylvatica</i>), ivy, a large mature oak, goat willow, sycamore (<i>Acer pseudoplatanus</i>) and very dense bramble, nettle and hawthorn scrub. The western boundary of the site comprises of ivy, dense bramble, hawthorn and common nettle scrub, ash, sycamore, conifer, goat willow and some of the land has been recently cleared. The eastern boundary of the site is made up of a wooden trellis along with a large mature oak, dense bramble, common nettles, ivy, <i>clematis spp.</i> , rose, <i>rhododendron spp.</i> , beech, and daffodils.
Fence	J2.4		There is a post and rail fence line along the southern and western boundary of the site.

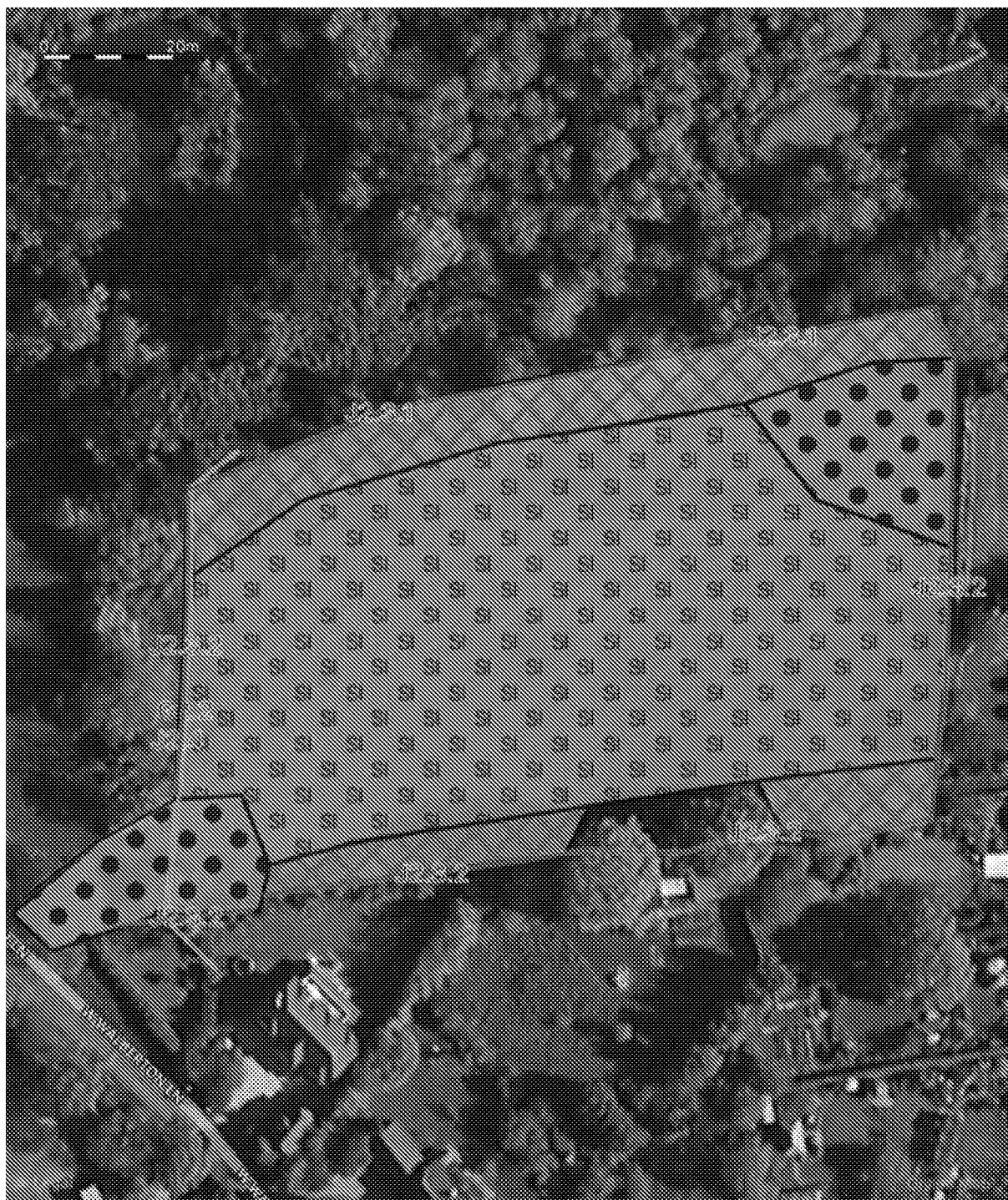


Figure 2. Phase 1 map of the site at Sunny Corner, Walberton.



Polygons		
	A2.1	Scrub - dense/continuous
	B6	Poor semi-improved grassland
	J4	Bare ground
Lines		
	G2.2	Running water - mesotrophic
	J2.3.1	Hedge with trees - native species-rich
	J2.3.2	Hedge with trees - species-poor
	J2.4	Fence

Figure 3. Key for Phase 1 habitat map for Land at Sunny Corner, Walberton.



Figure 3. Looking west across the site.



Figure 4. Some of the dense scrub within the site at Sunny Corner.



Figure 5. The existing entrance to the site from West Walberton Lane with the stream running along the western boundary.



3.2 Preliminary Ecological Appraisal

3.2.1 Badgers

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

Records of badgers are not provided by the records center, due to the sensitive nature of this information.

3.2.2 Bats

A number of mature trees were identified to support features suitable for roosting bats within the site. There are three mature oak trees and three mature ash trees that have moderate bat potential due to the presence of broken limbs, cracks and holes along with being covered in dense ivy growth (Figure 7).

In addition, the hedgerows and dense scrub along with the woodland adjacent to the north boundary are valuable habitats for foraging bats and the site boundaries must be considered to have high value for bat species. The hedgerows could provide some habitat linkage for bats roosting within trees in the woodland and commuting across the site to the wider landscape.

Records identified within the Sussex Biodiversity Record Centre (SxBRC) dataset show that the following species were recorded within 2km of the site: western barbastelle records from 2013, 2014 and 2015, serotine bats recorded in 2000, 2004, 2010 and 2016, myotis bats in 1986, bechstein's bat in 2006, brandt's bat in 2013, whiskered bat in 2013, natterer's bats in 2006 and 2013, pipistrelle bats in 2001, 2002, 2010, 2013, and 2015, common pipistrelle bats as recent as 2015 and as early as 1984, soprano pipistrelle in 2006, 2013 and 2015, long-eared bats in 2004, 2007 and 2015 and brown long-eared bats as early as 1986 and as recent as 2015.



Figure 6. The dense bramble and hawthorn scrub along the southern boundary.



Figure 7. One of the mature oak trees with cracks, holes and splits along the site boundary.

3.2.3 Breeding Birds

All of the scrub, hedgerows, trees have the potential to support a variety of common nesting birds during the breeding season (1st March to 31st August). There is little potential for ground nesting birds largely owing to a lack of suitable ground cover.

3.2.4 Dormice

This arboreal species favours mixed broadleaved woodland, where there are clear sources of food for as long of their active season as possible (March to October). The site provides a variety of suitable trees of known value to foraging dormice including oak, hazel and large patches of dense bramble and hawthorn scrub. Potwell Copse, a woodland parcel adjacent to the site contains large amounts of hazel and dense scrub which represents habitat of value for dormice (Figure 9) and there is good connectivity to the site boundaries.

Numerous records for dormice were identified within 2km of the site by SxBRC. The majority of the records identified are for Potwell Copse which is the parcel of Ancient re-planted woodland on the northern boundary of the site and it is part of the National Dormouse Monitoring Programme (NDMP).



Records for dormice in Potwell Copse start in 2004 and have been recorded every year up until 2011. There are also records for 'unspecified locations;' within Walberton and Wandleys Copse in Fontwell.



Figure 8. The dense scrub along the northern boundary bordering the woodland.



Figure 9. The woodland bordering the site to the north.



3.2.5 Great Crested Newts

No ponds were identified within the site however seven ponds were located within 500 metres of the site boundary using aerial background mapping (Figure 10). Pond 1 is 36 metres from the site boundary and has a fish population (Figure 14). Pond 2 is 86 metres from the site boundary and, also contains a fish population (Figure 16). Pond 3 is 51 metres from the site boundary and it is pipe-fed and used for surface water run-off from the house and gardens located at Sunny Corner (Figure 15). Pond 4 is located within the woodland and is 25m from the nearest site boundary, Pond 5 is 135m from the nearest site boundary and it is located on a flowing stream, Pond 6 is 230m from the nearest site boundary and this pond is also located on the flowing water course, and Pond 7 is 275m from the nearest site boundary and also located on the water course. Habitat Suitability Index (HSI) assessments were carried out on ponds 1, 2 and 3 (see Figures 11, 12 and 13) to gauge the suitability for great crested newts. There is suitable terrestrial habitat and dense scrub providing good connectivity to the site and surrounding woodland. Access was not permitted for Ponds 4, 5, 6 and 7 at the time of survey.

Records identified by the SxBRC show great crested newts are present within 2km of site with the most recent record being from 2012 and the earliest record from 2005. The two of the records in 2005 are located on land on Yapton lane which is 1.3 km from the nearest site boundary and the two records from 2012 are located at Eric Wall nursery in Barnham which is 1.8km from the nearest site boundary. There are records for palmate newt and smooth newt in 2000, 2005 and 2009.

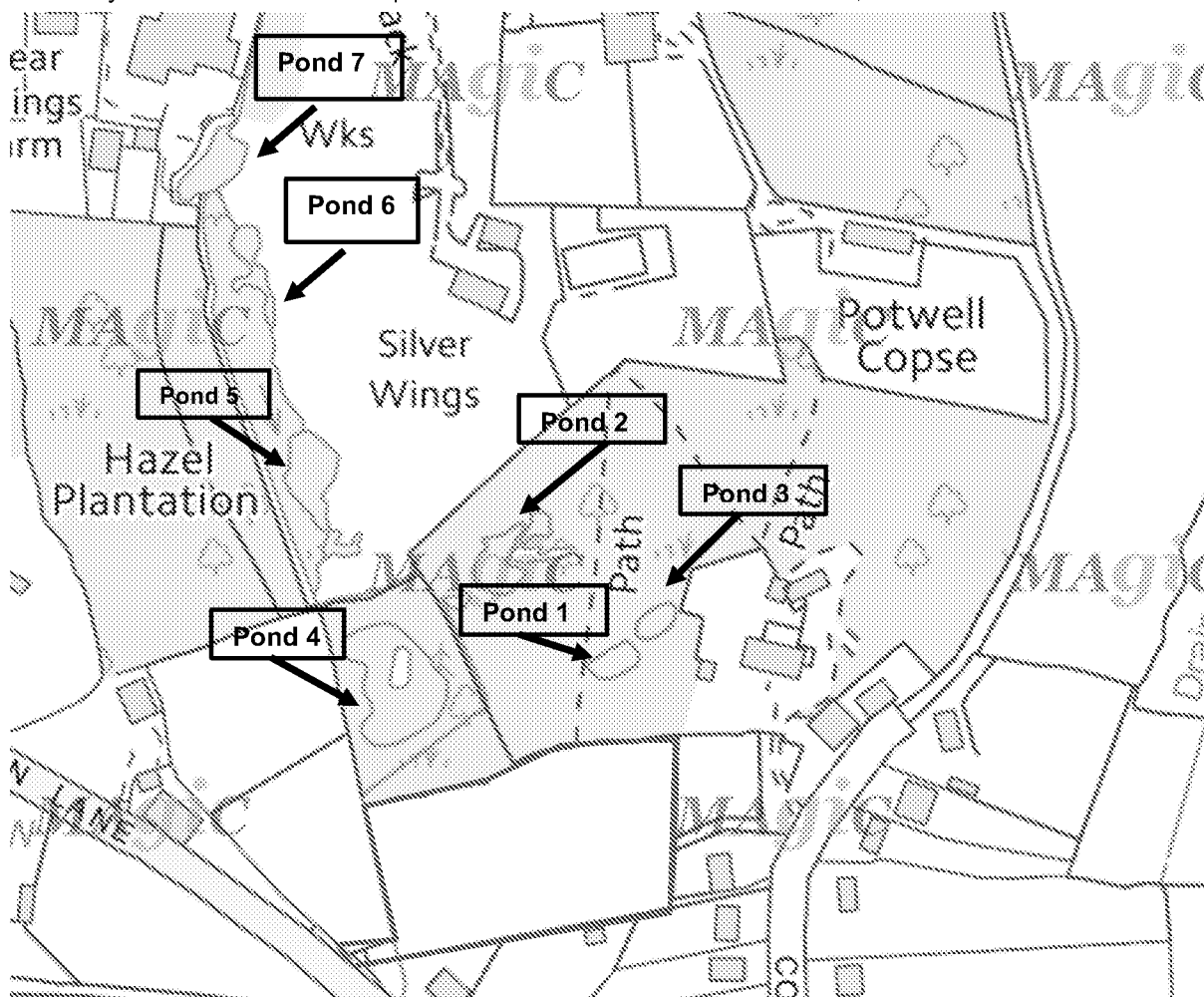


Figure 10. A MAGiC map showing the location of the ponds in relation to the site outlined in red.



Habitat Suitability Index				SI value
SI1. Map location	A/B/C	A		1.00
SI2. Surface area	rectangle/ellipse/irregular	ellipse		
	length (m)			
	width (m)			
	OR estimate (m) if irregular			
	area (m) =	240		0.48
SI3. Dessication rate	never/rarely/sometimes/frequently	never		0.90
SI4. Water quality	good/moderate/poor/bad	moderate		0.67
SI5. Shade	% of margin shaded 1m from bank	0		1.00
SI6. Waterfowl	absent/minor/major	minor		0.67
SI7. Fish population	absent/possible/minor/major	major		0.01
SI8. Pond density	number of ponds within 1km	2		0.84
SI9. Terrestrial habitat	good/moderate/poor/isolated	moderate		0.67
SI10. Macrophyte cover	%	0		0.31
Note: Guidance in undertaking the HSI is available at www.narrs.org.uk . HSI calculation formulae adapted from Rob Oldham				
HSI score =				0.45
Pond suitability =				poor

Figure 11. HSI assessment of Pond 1.

Habitat Suitability Index				SI value
SI1. Map location	A/B/C	A		1.00
SI2. Surface area	rectangle/ellipse/irregular	ellipse		
	length (m)			
	width (m)			
	OR estimate (m) if irregular			
	area (m) =	900		0.97
SI3. Dessication rate	never/rarely/sometimes/frequently	never		0.90
SI4. Water quality	good/moderate/poor/bad	moderate		0.67
SI5. Shade	% of margin shaded 1m from bank	10		1.00
SI6. Waterfowl	absent/minor/major	major		0.01
SI7. Fish population	absent/possible/minor/major	major		0.01
SI8. Pond density	number of ponds within 1km	2		0.84
SI9. Terrestrial habitat	good/moderate/poor/isolated	good		1.00
SI10. Macrophyte cover	%	20		0.51
Note: Guidance in undertaking the HSI is available at www.narrs.org.uk . HSI calculation formulae adapted from Rob Oldham				
HSI score =				0.35
Pond suitability =				poor

Figure 12. HSI assessment of Pond 2.



Habitat Suitability Index			SI value
SI1. Map location	A/B/C	A	1.00
SI2. Surface area	rectangle/ellipse/irregular	ellipse	
	length (m)		
	width (m)		
	OR estimate (m) if irregular		
	area (m) =	200	0.40
SI3. Dessication rate	never/rarely/sometimes/frequently	frequently	0.10
SI4. Water quality	good/moderate/poor/bad	poor	0.33
SI5. Shade	% of margin shaded 1m from bank	0	1.00
SI6. Waterfowl	absent/minor/major	minor	0.67
SI7. Fish population	absent/possible/minor/major	absent	1.00
SI8. Pond density	number of ponds within 1km	2	0.84
SI9. Terrestrial habitat	good/moderate/poor/isolated	moderate	0.67
SI10. Macrophyte cover	%	80	1.00
Note: Guidance in undertaking the HSI is available at www.narrs.org.uk			HSI score = 0.59
HSI calculation formulae adapted from Rob Oldham			Pond suitability = below average

Figure 13. HSI assessment of Pond 3.



Figure 14. Pond 1 located to the north of the site.



Figure 15. Pond 2 located within the woodland.



Figure 16. Pond 3 located to the north of the site next to Pond 1.



3.2.6 Reptiles

The entire site is made up of rough species poor grassland that is managed. There are large, dense areas of scrub along all boundaries of the site and some small piles of logs within the scrub area (Figure 17 and 18). There is good connectivity to the wider landscape and corridors for reptiles to move around the area, should they be present. There are ponds and Ancient re-planted woodland to the north of the site which is suitable habitat for grass snakes.

Records for slow worm, common lizard, adder and grass snake have been identified within 2km of the site by the SxBRC dataset in as recent as 2015 and 2016.



Figure 17. The grassland within the site.



Figure 18. Dense bramble scrub and tussocky grass along the field boundaries.

3.2.7 Water Voles

The stream located along the western boundary did not show any signs of water vole activity. The stream was shallow and devoid of any suitable vegetation that might provide shelter or food for water voles. No potential burrows, latrines or feeding remains were observed along this watercourse.

3.2.8 Designated Sites and Wider Ecological Impact Significance

A search was undertaken on the MAgiC website resource (www.magic.gov.uk) and there are a number of woodland areas in close proximity to the site that are designated as Ancient semi- natural woodland and Ancient re-planted woodland (see Figure 19). The woodland parcel, Potwell Copse, is adjacent to the proposed development site.



Figure 19. A MAgiC map showing the designated ancient re-planted woodland (hatched lines) and priority habitat of deciduous woodland (dark green colour) in relation to the site outlined in red.

3.3 Constraints/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.

4 DISCUSSION AND RECOMMENDATIONS

4.1 Preliminary Ecological Appraisal

The overall ecological value of the site is moderate, with the majority of the site comprised of species poor semi-improved grassland. The hedgerows with trees, the very dense bramble and hawthorn scrub offer the most valuable habitat to support a range of species.

4.1.1 Badgers

No signs of badger activity were identified during the assessment and no badger setts are situated within the sites boundaries. Although, there are habitats of value for this species in the wider landscape. However, if any signs of digging by large animals were identified within or near to the site boundaries prior to construction then an ecologist should be contacted for advice.



4.1.2 Bats

A number of mature trees were identified to have potential to support roosting bats within the site. There are three mature oak tree and three mature ash trees that have moderate bat roosting potential due to broken limbs and cracks. Some of the trees are covered in dense ivy which can support solitary roosting bats or obscure suitable roosting features. In line with Bat Conservation trust guidelines, it is recommended that a tree climbing assessment of the mature ash and oak 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.

Under Bat Conservation Trust Guidelines, to assess the use of the site by foraging and commuting bats, one activity survey visit per month is recommended between April and September by two surveyors - six activity surveys in total. Additionally, bat loggers will be deployed within the site for a week at a time once per season (Spring, Summer, Autumn). This information will establish the value of the habitats present for foraging bats, whilst the importance of any commuting features such as hedgerows and the stream can also be evaluated.

This survey effort is required due to the value of the adjacent habitats and because of nearby records for bechsteins and barbastelle bats, which are both Annex II species under the Habitats Directive.

It is likely as a rural development, any residential proposal will need to incorporate a sensitive scheme for artificial lighting, so that the impact of light upon bats and other wildlife is minimised where possible. In Appendix 2, guidelines produced by the Bat Conservation Trust are included and it is likely that the development would need to follow these guidelines.

4.1.3 Breeding Birds

All of the hedgerows, scrub and woodland habitat has a high potential to support a variety of nesting birds. It will be essential for any future development to consider the nesting bird season and any vegetation removal or building demolition should be timed outside of the nesting bird season (1st March to 31st August) unless features are first hand search by a suitably qualified ecologist.

4.1.4 Dormice

Habitat suitable for dormice is present within the site and in the surrounding area. The site comprises of dense bramble and hawthorn scrub, hedgerows with trees and the woodland adjacent to the northern boundary contains large amounts of hazel and the understory is suitable for foraging dormice. Due to the nature of this site and its connectivity to the woodland along the northern boundary it is considered to have a high potential to support a population of dormice. Further surveys are therefore recommended to establish presence/absence for the species according to guidelines set in the English Nature Dormouse Conservation Handbook.

A dormouse survey involves 50-100 nest tubes, spaced apart by 15-20 metres, within potentially suitable habitat on site to establish if they are present or absent. Dormouse surveys should be carried out over a number of months, usually between April and November. Each month of the year is given a score of suitability and a survey effort of up to 21 points will need to be achieved throughout the course of a year for suitable survey effort to be achieved.

A hazel nut search will also be included to identify if any nuts have been opened by dormice.



Month	Index of Probability
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2

Figure 20. Dormouse survey points scoring

If dormice are identified during the survey process, then a European Protected Species Licence would likely be required for the removal or disturbance of any habitats that could be used by this species such as scrub or hedgerows.

4.1.5 Great Crested Newts

Seven ponds were identified within 500 metres of the site using aerial background mapping. HSI assessments were carried out on three ponds (see Figures 11, 12 and 13) and two of the ponds scored 'poor' and one of the ponds scored 'below average'. Ponds 1 and 2 have fish populations at the time of survey there were a number of ducks and heron using the ponds and pond 3 is pipe-fed and used for surface water run-off deeming the water quality as poor. This makes it less likely that these ponds would support breeding great crested newts, however as a precautionary measure it is recommended that an environmental DNA (eDNA) assessment is undertaken on Ponds 1, 2 and 3 to ensure that the potential presence or absence of this species is known. Access to ponds 4, 5, 6 and 7 was not available at the time of survey.

4.1.6 Reptiles

The site is made up of habitat suitable for reptiles, with the grassland suitable for foraging reptiles and other features such as dense scrub, some small wood piles, hedgerows and the adjacent woodland to the north. It is recommended that a presence/absence survey is carried out at this site owing to the presence of potentially suitable habitat and records for slow worm, common lizard, grass snake and adder identified within 2km of the site.

A reptile presence/absence survey can be conducted between April and mid-October by placing a number of artificial refugia across the site (typically comprising of bitumen and/or corrugated metal sheeting), which are allowed to 'bed in' for a minimum of ten days before commencing the survey process. Seven surveys should be undertaken in the morning or late afternoon when the refugia have warmed in sunlight and the ambient air temperature is above 9 degrees Celsius. Surveys cannot be undertaken during periods of rainfall or strong winds and the optimal months for this survey are April, May and September.

It is important that the use of the site by reptiles (if any) is understood, so that if necessary, an appropriate mitigation strategy can be produced for any future development. Mitigation strategies are designed according to the species, population and distribution of reptiles and a presence/absence



survey is designed to gather this information is required.

4.1.7 Water Voles

The stream running along the western boundary of the site showed no signs of water vole activity. The suitability of this stream is limited by how shallow it is and the lack of suitable vegetation growth.

No further surveys are required for water voles in this instance.

4.2 Development Impact Assessment

This development would see the loss of some species poor grassland, dense bramble and hawthorn scrub and some hedgerows. The value of the proposed construction zone itself is not particularly high in biodiversity terms, but there is some potential for protected species to be present, particularly around the site boundaries and further surveys are required to understand what impact this development may have upon these species (if any).

If any protected species are found during the proposed work, an ecologist must be contacted immediately for advice.

Should you need any further advice on the information provided above, please do not hesitate to contact The Ecology Co-op.



5 REPEAT BOTANICAL ASSESSMENT

5.1 Results

Abundant Species

Yorkshire fog

Frequent Species

Birdsfoot trefoil, creeping bent

Occasional Species

White clover, creeping buttercup, common sorrel, self-heal, marsh thistle, fleabane, smooth hawkweed, oat grass, common nettle, small flowered forget-me-not, ribwort plantain, thyme leaved speedwell, common knapweed, red clover.

Rare Species

Creeping cinquefoil, soft rush, cut-leaved cranesbill, broad leaved dock, lesser stitchwort, bramble, common centaury, cleavers, wood avens, broad leaved willow herb, yarrow, creeping thistle, oxeye daisy, tufted vetch,

6 APPENDIX 1 – LEGISLATION AND POLICY

General

This section briefly describes the legal protection afforded to protected species. It is for information only and is not intended to be comprehensive or to replace specialised legal advice. It is not intended to replace the text of the legislation, but summarises the salient points.

Badger

Badger is protected in Britain under the Protection of Badgers Act 1992 and Schedule 6 of the Wildlife and Countryside Act 1981 (as amended).

The legislation affords protection to Badger and Badger setts, and makes it a criminal offence to:

- wilfully 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.

Bats, Dormouse and Great Crested Newt

Dormouse (*Muscardinus avellanarius*), Great Crested Newt (*Triturus cristatus*), and all species of British bat (*Vespertilionidae* and *Rhinolophidae*) are listed on *Schedule 5* of the *Wildlife and Countryside Act 1981* (as amended), and receive full protection under *Section 9*. These species are also all listed as



European Protected Species on *Schedule 2* of the *Conservation (Natural Habitats, etc.) Regulations 1994* which gives them full protection under *Regulation 39*. Protection was extended by the *Countryside and Rights of Way Act 2000* (the CRow Act). Under the above legislation it is an offence to:

- kill, injure or take an individual;
- possess any part of an individual either alive or dead;
- intentionally or recklessly damage, destroy or obstruct access to any place or structure used by these species for shelter, rest, protection or breeding;
- intentionally or recklessly disturb these species whilst using any place of shelter or protection; or
- sell or attempt to sell any individual.

It is also an offence to set and use articles capable of catching, injuring or killing bats (for example a trap or poison), or knowingly cause or permit such an action. In the case of Dormouse and all species of British bat there is also protection under *Schedule 6* of *The Wildlife and Countryside Act 1981* (as amended) relating specifically to trapping and direct pursuit of these species.

Dormouse, Great Crested Newt and all species of British bat are included as priority species in the *UK Biodiversity Action Plan* and as species of principal importance for the conservation of biological diversity in England under *Section 74* of the *Countryside and Rights of Way (CRow) Act 2000*.

Reptiles

Common Lizard (*Lacerta vivipara*), Grass Snake (*Natrix natrix*), Slow-worm (*Anguis fragilis*), and Adder (*Vipera berus*) are listed under *Schedule 5* of the *Wildlife and Countryside Act 1981* (as amended), in respect of *Section 9(5)* and part of *Section 9(1)*. This protection was extended by the *Countryside and Rights of Way (CRow) Act 2000*. Under the legislation it is an offence to:

- intentionally or deliberately kill or injure any individual of these species; or
- sell or attempt to sell any part of these species either alive or dead.

Nesting Birds

All species of bird are protected under *Section 1* of the *Wildlife and Countryside Act 1981* (as amended). Protection was extended by the *Countryside and Rights of Way (CRow) Act 2000*. Under the above legislation it is an offence to intentionally:

- kill, injure or take any wild bird;
- take, damage or destroy the nest of any wild bird while that nest is in use or being built; or
- take or destroy an egg of any wild bird.

Certain species are listed on *Schedule 1* of the *Wildlife and Countryside Act 1981* (as amended) and receive protection under *Sections 1(4)* and *1(5)*. The protection was extended by the *Countryside and Rights of Way (CRow) Act 2000*. There are special penalties where the offences listed above are committed for any *Schedule 1* species and it is also an offence to intentionally or recklessly:

- disturb any such bird when it is building its nest or while it is in or near a nest containing dependant young; or
- disturb the dependant young of any such bird.

Roman Snails

In 2008, the Roman snail (*Helix pomatia*) was added to *Schedule 5* of the *Wildlife and Countryside Act 1981* (as amended), and it became an offence to intentionally kill, injure or take individuals of this species.



7 Appendix 2 - Artificial Lighting and Wildlife

Interim Guidance: Recommendations to help minimise the impact of artificial lighting - produced by The Bat Conservation Trust.

Wherever human habitation spreads, so does artificial lighting. This increase in lighting has been shown to have an adverse effect on our native wildlife, particularly on those species that have evolved to be active during the hours of darkness. Consequently, development needs to carefully consider what lighting is necessary and reduce any unnecessary lighting, both temporally and spatially. When the impacts on different species groups are reviewed, the solutions proposed have commonalities that form the basis of good practice. These are outlined in the following document.

Overview of impacts

Invertebrates

Artificial light significantly disrupts natural patterns of light and dark, disturbing invertebrate feeding, breeding and movement, which may reduce and fragment populations. Some invertebrates, such as moths, are attracted to artificial lights at night. It is estimated that as many as a third of flying insects that are attracted to external lights will die as a result of their encounter.¹ Insects can become disoriented and exhausted making them more susceptible to predation. In addition, the polarisation of light by shiny surfaces attracts insects, particularly egg laying females away from water. Reflected light has the potential to attract pollinators and impact on their populations, predators and pollination rates. Many invertebrates natural rhythms depend upon day-night and seasonal and lunar changes which can be adversely affected by artificial lighting levels.

It is not always easy to disentangle the effects of lighting on moths from other impacts of urbanisation. However, it is known that UV and green and blue light, which have short wavelengths and high frequencies, are seen by most insects and are highly attractive to them. Where a light source has a UV component, male moths in particular will be drawn to it. Most light-induced changes in physiology and behaviour are likely to be detrimental. They discern it to be 'light', so they do not fly to feed or mate.²

Birds

There are several aspects of changes to bird behaviour to take into account. The phenomenon of robins and other birds singing by the light of a street light or other external lighting installations is well known, and research has shown that singing did not have a significant effect on the bird's body mass regulation. However, it was felt that the continual lack of sleep was likely to be detrimental to the birds' survival and could disrupt the long-term circadian rhythm that dictates the onset of the breeding season³. Many species of bird migrate at night and there are well-documented cases of the mass mortality of nocturnal migrating birds as they strike tall lit buildings. Other UK bird species that are particularly sensitive to artificial lighting are long-eared owls, black-tailed godwit and stone curlew.⁴

Mammals

A number of our British mammals are nocturnal and have adapted their lifestyle so that they are active in the dark in order to avoid predators. Artificial illumination of the areas in which these mammals are active and foraging is likely to be disturbing to their normal activities and their foraging areas could be



¹ Bruce-White C and Shardlow M (2011) A Review of the Impact of Artificial Light on Invertebrates - See more at: <http://www.buglife.org.uk/advice-and-publications/publications/campaigns-and-reports/review-impact-artificial-light#sthash.s7GPA1vL.dpuf>

As above

³ Pollard A. (2009) Visual constraints on bird behaviour. University of Cardiff

⁴ Rodriguez A., Garcia A.M., Cervera F. and Palacios V. (2006) Landscape and anti-predation determinants of nest site selection, nest distribution and productivity in Mediterranean population of Long-eared Owls, *Asio otus*. *Ibis*, 148(1), pp.133-145

lost in this way. It is thought that the most pronounced effect is likely to be on small mammals due to their need to avoid predators. However, this in itself has a knock-on effect on those predators.

The detrimental effect of artificial lighting is most clearly seen in bats. Our resident bat species have all suffered dramatic reductions in their numbers in the past century. Light falling on a bat roost exit point, regardless of species, will at least delay bats from emerging, which shortens the amount of time available to them for foraging. As the main peak of nocturnal insect abundance occurs at and soon after dusk, a delay in emergence means this vital time for feeding is missed. At worst, the bats may feel compelled to abandon the roost. Bats are faithful to their roosts over many years and disturbance of this sort can have a significant effect on the future of the colony. It is likely to be deemed a breach of the national and European legislation that protects British bats and their roosts.

In addition to causing disturbance to bats at the roost, artificial lighting can also affect the feeding behaviour of bats and their use of commuting routes. There are two aspects to this: one is the attraction that short wave length light (UV and blue light) has to a range of insects; the other is the presence of lit conditions.

As mentioned, many night-flying species of insect are attracted to lamps that emit short wavelength component. Studies have shown that, although noctules, serotines, pipistrelle and Leisler's bats, take advantage of the concentration of insects around white street lights as a source of prey, this behaviour is not true for all bat species. The slower flying, broad-winged species, such as long-eared bats, barbastelle, greater and lesser horseshoe bats and the *Myotis* species (which include Brandt's, whiskered, Daubenton's, Natterer's and Bechstein's bats) generally avoid external lights.

Lighting can be particularly harmful if it illuminates important foraging habitats such as river corridors, woodland edges and hedgerows used by bats. Studies have shown that continuous lighting along roads creates barriers which some bat species cannot cross⁵. It is also known that insects are attracted to lit areas from further afield. This could result in adjacent habitats supporting reduced numbers of insects, causing a further impact on the ability of light-avoiding bats to feed.

These are just a few examples of the effects of artificial lighting on British wildlife, with migratory fish, amphibians, some flowering plants, a number of bird species, glow worms and a range of other invertebrates all exhibiting changes in their behaviour as a result of this unnatural lighting.

Recommendations

Survey and Planning

The potential impacts of obtrusive light on wildlife should be a routine consideration in the Environmental Impact Assessment (EIA) process⁶. Risks should be eliminated or minimised wherever possible. Some locations are particularly sensitive to obtrusive light and lighting schemes in these areas should be carefully planned.

In August 2013, Planning Minister Nick Boles launched the new National Online Planning Guidance Resource aimed at providing clearer protection for our natural and historic environment. The guidance looks at when lighting pollution concerns should be considered and is covered within one of the on line planning practice guides⁷. The guide provides an overview for planners with links to documents that aim to give planners an overview of the subject through the following discussion points:



⁵ Stone E. L., Jones G and Harriss (2009) Street lighting disturbs commuting bats. Current Biology, 19, pp 1-5

⁶ See also: Institution of Lighting Professionals – Professional Lighting Guide (PLG 04) Guidance on undertaking lighting environmental impact assessments)

1. When is obtrusive light / light pollution relevant to planning?
2. What factors should be considered when assessing whether a development proposal might have implications for obtrusive lighting / light pollution?
3. What factors are relevant when considering where light shines?
4. What factors are relevant when considering how much the light shines?
5. What factors are relevant when considering possible ecological impact?

This can help planners reach the right design through the setting of appropriate conditions relating to performance and mitigation measures at the planning stage.

The Institution of Lighting Professionals (ILP) recommends that Local Planning Authorities specify internationally recognised environmental zones for exterior lighting control within their Development Plans⁶. In instances lacking classification, it may be necessary to request a Baseline Lighting Assessment/Survey conducted by a Lighting Professional in order to inform the classification of areas, particularly for large-scale schemes and major infrastructure projects.

When assessing or commissioning projects that include the installation of lighting schemes, particularly those subject the EIA process, the following should be considered and relayed to applicants:

- **Ecological consultants should confirm the presence of any sensitive fauna and flora**, advising the lighting designers of bat routes and roosts and other areas of importance in order to ensure that reports correspond with each other.
- **Ecological consultants should consider the need for quantitative lighting measurements**. In some instances it may be necessary for further lighting measurements to be taken. For example, outside an important bat roost. These should follow best practice guidance from the ILP and would ideally be conducted by a Lighting Professional.
- **Where appropriate, professional lighting designers should be consulted** to design and model appropriate installations that achieve the task but mitigate the impacts. This should be done at the earliest opportunity. Early decisions can play a key role in mitigating the impact from lighting.
- **Reports submitted should outline the impacts of lighting in relation to ecology**, making clear reference to the ecological findings, highlighting any sensitive areas and detail proposed mitigation. Consideration should also be given to internal lighting where appropriate.
- **Post –installation checks and sign off upon commissioning should be carried out** by the lighting designer to ensure that the lighting installation has been installed in accordance with the design, that predictions were accurate and mitigation methods have been successful.

Principles and design considerations

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
- **consider no lighting solutions where possible** such as white lining, good signage and LED cats eyes. These options can also be effective. 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.

Technological specifications

Research from the Netherlands has shown that spectral composition does impact biodiversity.

- **Use narrow spectrum light sources** to lower the range of species affected by lighting.
- **Use light sources that emit minimal ultra-violet light**
- **Lights should peak higher than 550 nm**
- **Avoid white and blue wavelengths of the light spectrum** to reduce insect attraction and where white light sources are required in order to manage the blue short wave length content they should be of a warm / neutral colour temperature <4,200 kelvin.

Further guidance on the spectral composition of artificial lighting will be made available following the publication of research from the Netherlands.

Further reading:

- A review of the impact of artificial light on invertebrates. Buglife. 2011
- Royal Commission on Environmental Pollution. 2009. Artificial light in the environment. London, HMSO
- The Ecological Consequences of Artificial Night Lighting" edited by Longcore and Rich
- Shedding Light: A survey of local authority approaches to lighting in England. CPRE 2014



<http://planningguidance.planningportal.gov.uk/blog/guidance/light-pollution/when-is-light-pollution-relevant-to-planning/> <http://planningguidance.planningportal.gov.uk/blog/guidance/light-pollution/when-is-light-pollution-relevant-to-planning/>

⁸ Institution of Lighting Professionals (2011) Guidance Notes for the Reduction of Obtrusive Light
GN01:2011

