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Preliminary Ecological Appraisal, Phase 1 Habitat Assessment

Land at Bonhams, Hoe Lane, Flansham

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Report Summary

1. A combined Phase 1 Habitat Survey and Preliminary Ecological Appraisal was undertaken for land at Bonhams, Hoe Lane, Flansham on the 27th 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 Pallant Homes Limited., who wish to make an application for a residential development on this land.

2. This assessment was undertaken by Briony Hill a Graduate member of Chartered Institute for Ecology and Environmental Management (CIEEM).

3. The site is situated just north of Flansham, West Sussex. The size of the area surveyed is approximately 1.9 hectares in area and supports a field of poor semi-improved grassland with ruderal habitat and a shed, two residential properties, which will remain undisturbed by the proposals, and their large garden spaces supporting amenity grassland, scattered parkland/broadleaved trees, species poor hedgerow and bare ground along with a barn style garage and an outhouse/garage are present within the sites boundaries.

4. No further surveys are recommended for dormice, water voles or protected invertebrates. A reptile presence/absence survey, great crested newt surveys of all ponds within 500 meters and three bat activity surveys are recommended at the site. A bat emergence survey will be necessary on the barn style garage and outhouse/garage if these are to be demolished as part of the proposal. A repeat badger check should be undertaken 8 weeks prior to site clearance and construction. Works should be timed as to not conflict with the nesting bird season (1st March to 31st August) with hand searches by an ecologist necessary for vegetation removal during this time if necessary.

5. A 'Mitigation Statement' should be produced once all the recommended phase 2 surveys have been completed. This should outline a range of suitable ecological enhancement measures to benefit wildlife at the site such as the planting of species rich hedgerows.

6. The development is unlikely to have an impact upon the Felpham Site of SSSI identified 2km to the south west.

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

This report gives details of a combined Preliminary Ecological Appraisal (PEA) and Phase 1 Habitat Survey for the potential presence or likely absence of protected species and or valuable habitats to be found on land at Bonhams, Hoe Lane, Flansham. The grid reference for the site centre is SU 96162 01081.

Where necessary appropriate mitigation measures 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 Briony Hill, 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 Pallant Homes Limited.

1.2 Background

The Ecology Co-operation was commissioned to assess the current ecological value of Land at Bonhams, Hoe Lane, Flansham, which is situated just north of Flansham, West Sussex (see Figure 1). The size of the area surveyed is approximately 1.9 hectares in area and supports a field of poor semi-improved grassland with ruderal habitat and a shed. Two residential properties, which will remain undisturbed by the proposals, and their large garden spaces supporting amenity grassland, scattered parkland/broadleaved trees, species poor hedgerow and bare ground along with a barn style garage and an outhouse/garage are also present.

The assessment was carried out further to a proposal to develop this land into a residential area to include approximately 39 houses.

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

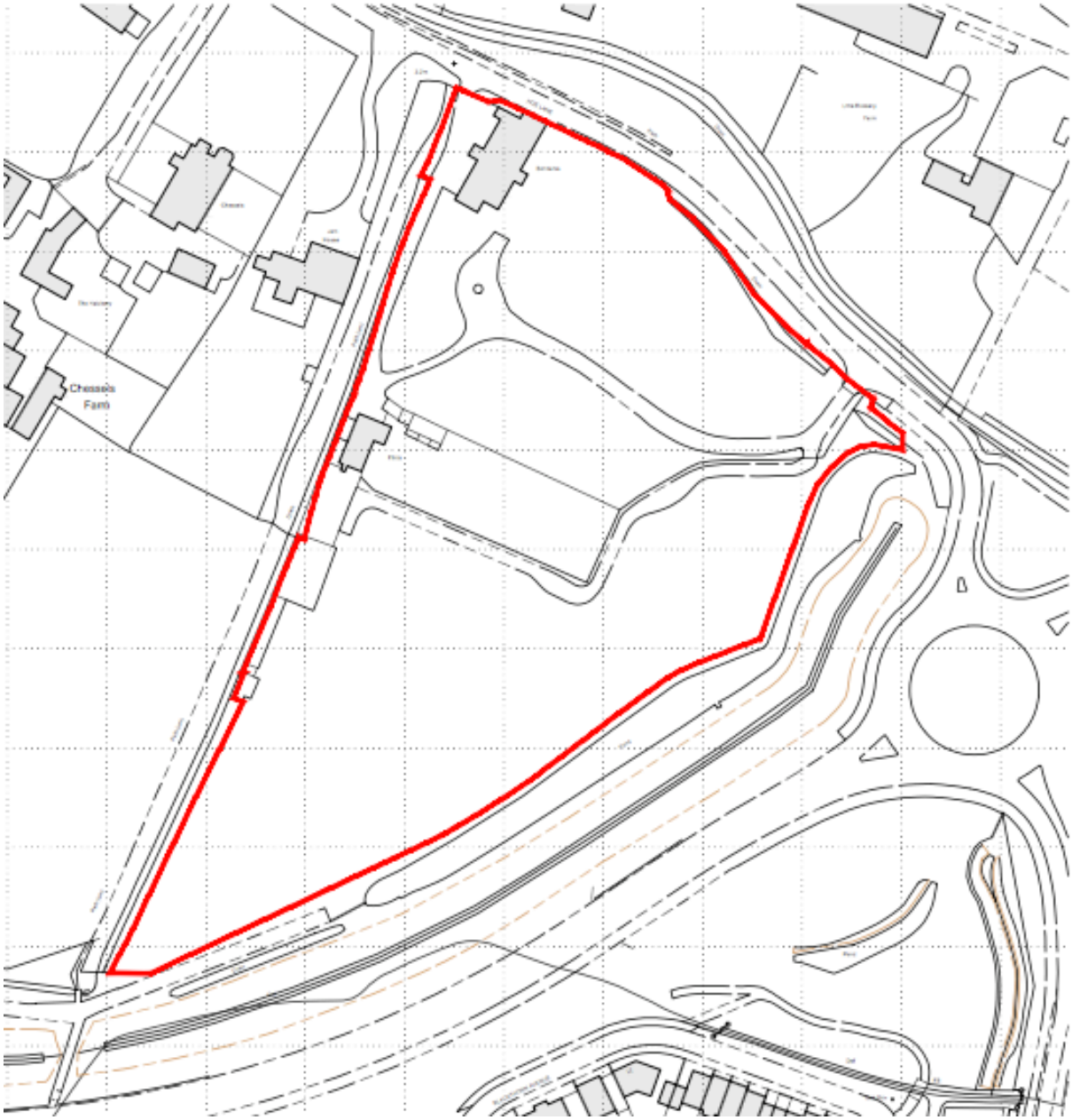

Figure 2. Existing site plan with the site boundary shown in red.

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 the 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

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substrate features, particularly where vegetation is not the dominant component of the habitat[1].

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 (PEA) was carried out on 27th 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*); and
- 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 that the species were present[2][3][4][5][6][7]. Details of initial survey method for each species are given below.

Following the appraisal of this site it was decided that a biodiversity records search was required for all protected and species within a 2km radius of the site. The use of biodiversity records followed guidelines set out by CIEEM[8]. These were obtained on the 29/03/17 from the Sussex Biodiversity Records Centre (SxBRC) and reference to these records is made where appropriate within this report.

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

[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*

[8] CIEEM (2016) *Guidelines for Assessing and Using Biodiversity Data.*

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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.

2.2.5 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 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).

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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.

3 RESULTS

3.1 Phase 1 Habitat Survey/site Context

This site supports a field of poor semi-improved grassland, ruderal habitat and a shed. In addition, two residential properties are within the site boundary, which will remain undisturbed by the proposals. Included within the curtilage of these properties is their large garden spaces supporting amenity grassland, scattered parkland/broadleaved trees, species poor hedgerow, bare ground of tarmac, concrete and gravel along with a barn style garage and an outhouse.

Whist 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 Bonhams, Hoe Lane, Flansham.

Habitat type	**JNCC Code**	**Area(Ha)/ Length (meters)**	**Target note including general composition**
Poor semi-improved grassland	B6	0.75 Ha	This area is tussocky and appears to be sprayed with herbicide regularly (see figure 5). The grassland is composed of common couch (*Elymus repens*), Poa sp., Yorkshire fog (*Holcus lanatus*) and Agrostis sp. along with the following grassland plants creeping thistle (*Cirsium arvense*), thistle sp., common nettle (*Urtica dioica*), ragwort (*Jacobaea vulgaris*), cleavers (*Galium aparine*), sorrel sp. (*Rumex sp.*), creeping buttercup (*Ranunculus repens*), lesser celandine (*Ficaria verna*), creeping cinquefoil (*Potentilla reptans*), broadleaved dock (*Rumex obtusifolius*) and willow herb sp. (*Epilobium sp.*). Across this habitat and along the shed at the north western boundary are patches of ruderal habitat dominated by common nettle but also supporting cleavers, cow parsley (*Anthriscus sylvestris*), common hogweed (*Heracleum sphondylium*), broad-leaved dock and lesser celandine (see figure 6).
Other tall herb and fern - ruderal	C3.1	0.15 Ha	Earth mounds are located at the south-western corner of the site which support ruderal habitat (see figure 7). Nettle is abundant here with broad leaved dock, red dead nettle, cleavers, hairy bittercress (*Cardamine hirsuta*), willow herb sp., ground ivy (*Glechoma hederacea*), common hogweed, ragwort, white dead nettle (*Lamium album*) and lords and ladies (*Arum maculatum*) all present.
Bare ground	J4	0.2 Ha	Areas of concrete, gravel and tarmac hard standing are

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			present across the site. These include a track providing access to the southern property and a gravel driveway providing access to Bonhams house.
Amenity grassland	J1.2		The existing garden space of the two properties is dominated by amenity grassland which is mown short (see figures 8). The following species were identified moss sp., daisy (*Bellis perennis*), ragwort, red clover (*Trifolium pratense*), dove's-foot crane's-bill (*Geranium molle*), lesser celandine, yarrow (*Achillea millefolium*), chickweed (*Stellaria media*) and grass which could not be identified due to its very short height. Within the largest garden space are herbaceous boarders, scattered shrubs of the following species; holly (*Ilex aquifolium*), cherry (*Prunus sp.*), elder (*Sambucus nigra*), cypress and hawthorn (*Crataegus monogyna*) and low box shaped cotoneaster hedgerows. In the south-eastern area of amenity grassland are six scattered semi mature fruit trees including apple (*Malus sp.)* and cherry species.
Mixed Parkland/scattered trees	A3.3		Mixed scattered trees are located within the existing garden space of Bonhams. Species present include hornbeam (*Carpinus betulus*), cherry, beech (*Fagus sylvatica*), hawthorn, oak sp. (*Quercus sp.*), weeping willow (*Salix babylonica*), cedar sp. (*Cedrus spp.*), holly and an unidentified tree species and a possible crack willow (*Salix fragilis*).
Scattered parkland/ broadleaved trees	A3.1		A line of scattered hornbeam trees are located between the existing garden spaces of the two properties.
Intact Hedegrow – species poor	J2.1.2		An intact cypress (*Cupressus sp.*) hedgerow is located across an area of amenity grassland within the existing garden space. Along the north-eastern boundary is a species poor pruned hedgerow of privet, holly and herbaceous species.
Buildings	J3.6		Two residential properties are located within the sites boundaries. These will remain undisturbed by the development. A newly built barn style garage is located to the south of the smaller property and an outhouse/garage is situated to the north of this property. It has not been confirmed if these will remain.

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			A shed is situated along the north-western boundary of the semi improved grassland. This is described in detail in section 3.2.2.
Fence	J2.4		A wooden fence with wire mesh is located along the entire south eastern boundary and part of the western boundary (see figure 5).
Wall	J2.5		A length of brick wall is located between the garden spaces of the two properties.

A large SUDS pond is located just beyond the south-eastern boundary. This is described in detail in section 3.2.5.

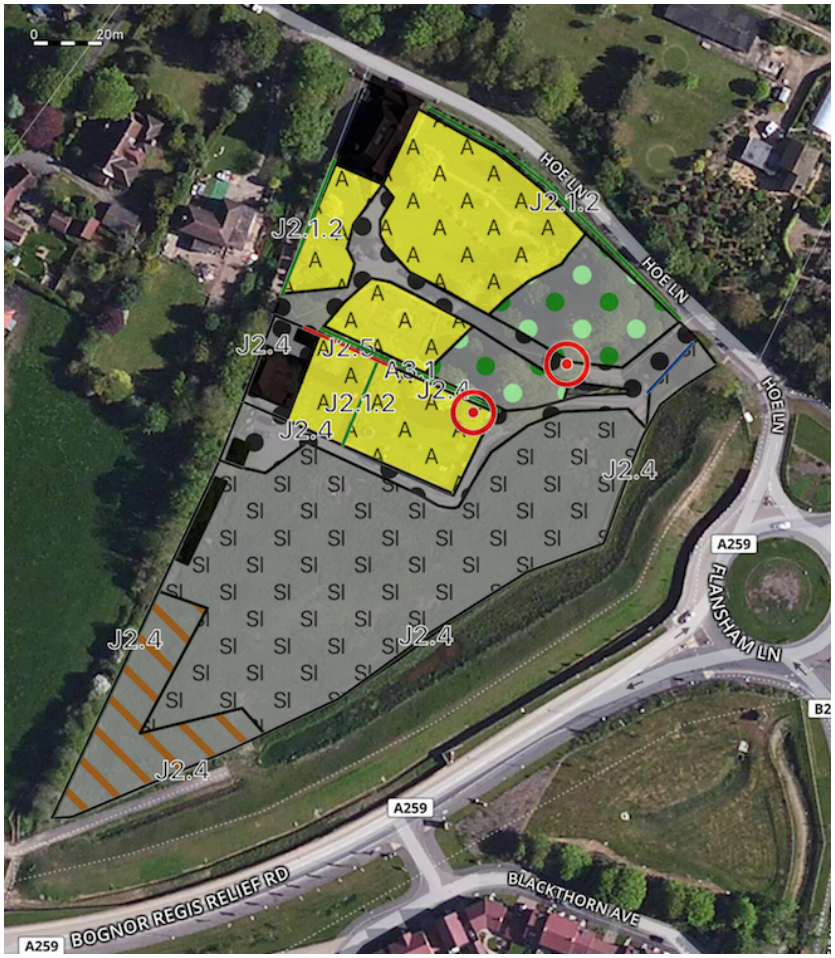

Figure 3. Phase 1 map of land at Bonhams, Hoe Lane, Flansham.

Polygons

A3.3	Mixed Parkland/ scattered trees
B6	Poor semi-improved grassland
C3.1	Other tall herb and fern - ruderal
J1.2	Cultivated/disturbed land - amenity grassland
J3.6	Buildings
J4	Bare ground

Lines

A3.1	Broadleaved Parkland/ scattered trees
J2.1.2	Intact hedge - species-poor
J2.4	Fence
J2.5	Wall

Figure 4. Key for Phase 1 habitat map for Land at Bonhams, Hoe Lane, Flansham

Figure 5. View of the tusocky poor semi improved grassland from the north with the fence located along the south-eastern boundary shown.

Figure 6. View of species poor grassland supporting patches of ruderal habitat from the south west.

Figure 7. The earth mounds with ruderal habitat at the south west corner of the site.

Figure 8. Amenity grassland within the garden space of the southern property.

Figure 9. Garden space of Bonhams supporting amenity grassland, gravel hard standing, scattered parkland and broadleaved trees and a species poor hedges.

3.2 Preliminary Ecological Appraisal

3.2.1 Badgers

No signs of any badger activity, in the form of snuffle holes, burrows or setts, were seen during the survey assessment, though there are habitats of value for this species to the west of the site. 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.

Some mammal burrows were identified within the wooden and chrysotile shed along the north-western boundary however these were all too narrow for badgers to use and are concluded as being rabbit burrows.

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

3.2.2 Bats

Roosting Habitat

A shed with corrugated chrysotile roof, proposed to be demolished, is located along the north-western boundary of the grass field. The walls of the building are composed of a mixture of brick, single skinned wooden boarding and wooden panels within an outer layer of corrugated chrysotile (see figure 10 and

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11). The single skinned wooden boarding doesn't have any bat roosting potential and the areas with an outer cover of corrugated chrysotile is highly unlikely to support bats due to the thermoregulatory properties leading to it heating up and cooling down quickly, with bats known to favor roosting sites with a stable temperature.

The building doesn't support any voids with the corrugated chrysotile roof unlined except for a single section which is lined with insulation and wooden boarding (see figure 12). Internally it is unsuitable to support void dwelling species such as *Plecotus* as it is brightly lit and exposed to air movement due to the building being dilapidated with open windows and doors and some gaps within the walls (see figure 12). Furthermore, some of the of the rooms were heavily cobwebbed.

A wall cavity was identified internally between two walls of wooden slat boarding. The gap was identified as being approximately 5cm wide and could potential support bats.

Figure 10. View of the dilapidated brick and single skinned walled shed with corrugated chrysotile roof from the south.

Figure 11. View of the dilapidated shed from the north east.

Figure 12. Internal view of the dilapidated shed. Left showing insulation and wooden boarding present in one section.

A barn style garage is situated to the south of the southern property (see figure 13). This is a new building and is only a few years old. It has tightly fitting wooden slat board walls on the western and eastern face, a low wooden slat board wall on the southern face, whilst the northern face is open sided. There are numerous gaps between the handmade clay tiles on the roof with the potential to support crevice dwelling bat species while the hip and ridge tiles are tightly plugged (see figure 14). The roof is lined with a breathable membrane and the building does not support a void being exposed to roof height internally. Internally the building is unsuitable for void dwelling species as it is lit and exposed to air movement due to the open northern face (see figure 15). Modern wooden beams support the building however no splits, cracks or gaps at the mortice joints were identified to support roosting bats.

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Figure 13. The newly built barn style shed located south of the southern property.

Figure 14. Numerous gaps with the potential to support bats are present between the hand-made clay tiles upon the roof.

Figure 15. Internal view of the barn style garage.

An outhouse/garage building is located to the north of the southern property (see figure 16). This building is brick walled with factory formed clay tiles across the majority of the roof and a section with a bitumen lined roof (see figure 17). The roof tiles are mostly tight fitting with an area of lifted tiles on the eastern corner of the southern face which has the potential to support crevice dwelling bats (see figure 18). The building supports an inaccessible internal roof void, formed by metal supports and boarding, which could not be inspected (see figure 19). The eaves are tightly fitting and would not provide access to this void however it is possible that bats could access it from the lifted tiles.

Figure 16. Brick walled outhouse located to the north of the southern property.

Figure 17. Brick built garage/outhouse with a tight fitting factory formed tiles are a section lined with bitumen.

Figure 18. Lifted tiles with the potential to support bats on the southern face.

Figure 19. Internal view of the garage/outhouse showing the presence of an inaccessible void.

Within the sites boundaries is a beech, marked as target note 2, which has a rotten limb within its crown supporting 5 woodpecker holes with high bat roosting potential (see figure 20).

Figure 20. Beech tree which has a rotten limb within its crown supporting 5 woodpecker holes.

Foraging Value

Overall the site has low value for foraging bats with the mown amenity grassland, hard standing bare ground and semi improved rough grassland covering the majority of the site. The scattered parkland and broadleaved trees within the garden space of Bonhams has moderate value for foraging bats whilst the SUDS ponds located a few meters of the south-eastern site boundary has high value because it is likely to support a variety of invertebrate prey.

SxBRC identified records for serotine (*Eptesicus serotinus*), whiskered (*Myostis mystacinus*), noctule (*Nyctalus noctula*), common pipistrelle (*Pipistrellus pipistrellus*) and brown Long-eared bats (*Plecotus auritu*s) within 2km of the site. Records for western barbastelle bats (*Barbastella barbastellus*) from 2015 were also identified within the parish of Yapton and Barnham, however the exact location is unspecified due to the sensitive nature of this information. The site is unlikely to be of any importance for this woodland associated species given that it supports only a small area of mixed scattered parkland trees and this is most likely to be a record of a foraging bat.

3.2.3 Breeding Birds

All of the scrub, hedgerows, trees and the shed have the potential to support a variety of common nesting birds.

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There are records for breeding lapwing, the most recent from 2015, located within 2km of the site and records for skylark, from 2015. The site itself however is considered unsuitable for these ground nesting birds which are associated with open farmland, moorland, marshland and heathland. The site supports an open field however this is small in size and disturbed by fairly regular use and therefore it is unlikely that these bird species would be found on site at any time.

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 species poor hedgerows comprised of herbaceous species located along the north and north western boundary of Bonhams property are unsuitable for this species. The scattered parkland and broadleaved trees are also unsuitable for this species. Furthermore, these scattered trees are isolated from further woodland or hedgerows with the potential to support dormice within the wider landscape.

No records for dormice were identified within 2km of the site by SxBRC.

3.2.5 Great Crested Newts

No ponds are located within the sites boundaries however a SUDS pond is situated just a few meters from the south-eastern boundary of the site. Furthermore, 7 additional ponds were identified within 500 meters of the site (see figure 21).

Pond 1 is located approximately 210 meters to the west situated within a pasture field. A small pond is situated to the east of this on the edge of the same pasture field. These ponds could not be accessed at the time of the survey and therefore there potential to support great crested newts has not be assessed.

Pond 2, 3, 4 and 5 are all SUDS ponds which are located approximately 272 meters west, 255 meters to the west, 135 meters west respectively with pond 5 just a few meters from the sites south eastern boundary. Ponds 3 and 5 had very shallow water and it is therefore expected that the dry out very frequently and pond 4 did not support water at the time of the survey reducing their potential to support great crested newts (see figure 22). These ponds were heavily vegetated with a macrophyte cover of between 90% and 100% comprised of bulrush (Typha sp.), soft rush (*Juncus effusus*) and goat willow and willow sp. saplings. Close to the southern boundary of the ponds is the A 259 however suitable foraging habitat is located to the north of them.

Pond 2 supports deep water and has bullrush established around the edge (see figure 23). It has a major water fowl impact with mute swans, mallard and heron recorded during the assessment. Further to this there are areas of noticeable grazing by birds on the banks.

Pond 6 is situated within a garden approximately 255 meters to the north. The owner of the pond informed us that this pond dries out frequently and had a large fish population is the past. There is approximately 30% macrophyte cover with the following species recorded: soft rush, sedge sp., willow herb sp., bull rush and a number of exotic species. A duck house and additional bird house are present leading to minor to possible major waterfowl impact. The surrounding terrestrial habitat is poor with a narrow strip of long surrounding grassland with a hard-standing tarmac lane to the south and mown

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amenity grassland to the north and west beyond this.

Finally, pond 7 and 8 are located to the south of the site on the other side of the A259 which is considered as a considerable barrier to movement for this species and as a result these ponds have been scoped out.

The site supports rough tussocky grassland which has the potential to be used by foraging and commuting great crested newts. There are also hibernacula across the site in the form of a large pile or brash and leaves, piles of straw and logs and earth mounds.

The biodiversity records obtained from SxBRC identified a great crested newt record, from 2016, approximately 280 meters to the east of the site. The record appears to be associated with one of two ponds located there.

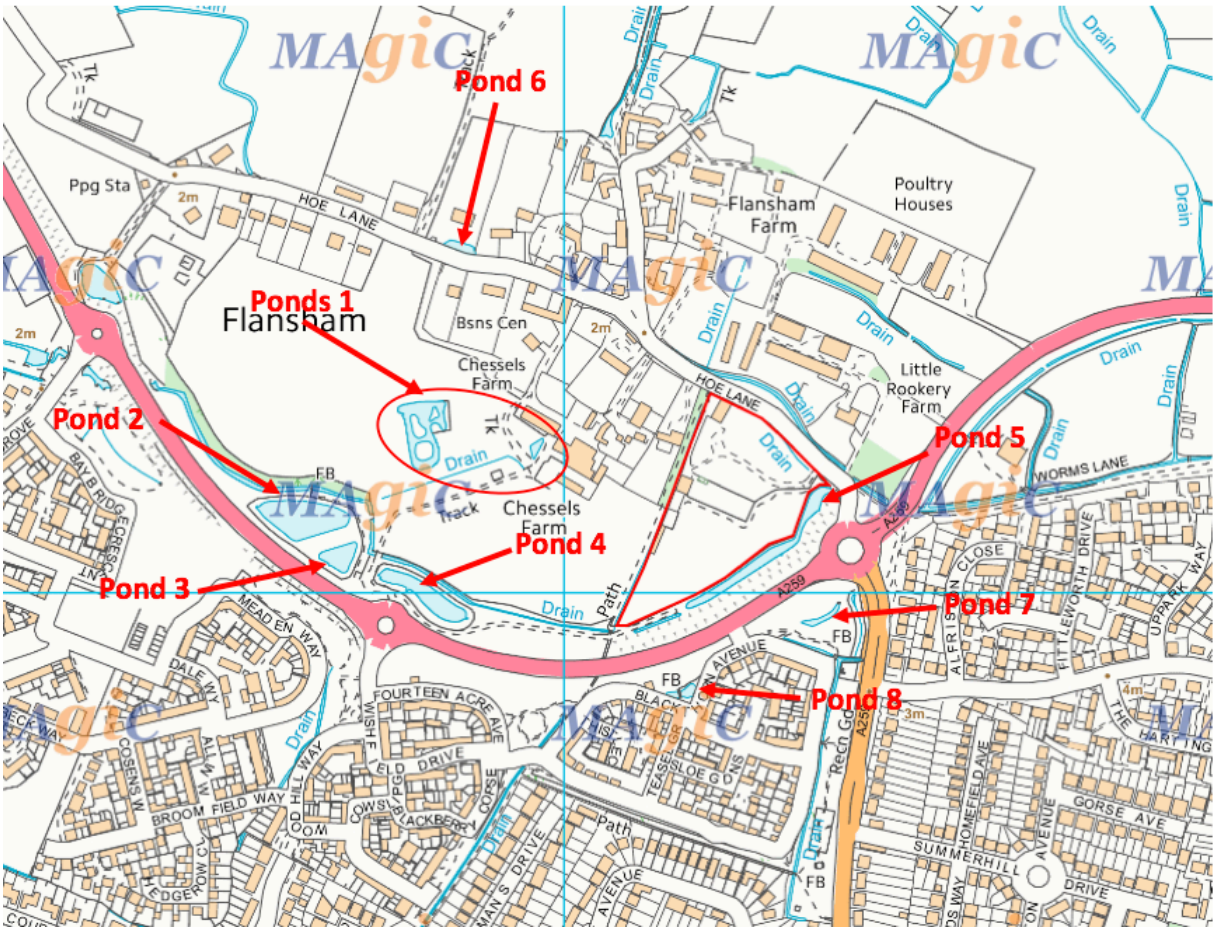

Figure 21. Locations of ponds in relation to the site with the sites approximate boundaries shown in red.

Figure 22. Left **–** pond 5 a SUDS pond located a few meters from the south-eastern boundary. Right – Pond 3 a SUDS pond.

Figure 23. Pond 2 a SUDS pond

3.2.6 Reptiles

The site is suitable for reptiles with the species poor improved grassland, which covers approximately half of the site and ruderal habitat providing suitable cover from predators for this group of species and basking sites which most native UK reptiles typically require. In addition, the SUDS pond located just a few meters from the south-eastern boundary could support suitable amphibian prey for grass snakes. Further to this there are suitable hibernacula upon the site with a large pile of brash and leaves located close to the sites center (marked as target note 1 on the phase 1 map) a pile of straw, a log pile and earth mounds also present (see figure 24).

Records for slow worms, from 2014, and grass snakes, from 2011, within 2km of the site were identified by SxBRC. This indicates that there is a population of these species within the wider landscape.

Figure 24. Large pile of brash considered to be a suitable reptile hibernacula.

3.2.7 Water Voles

The biodiversity records obtained from SxBRC identified a number of water vole records within 2km of the site with the most recent from 2015. The majority of these records are associated with Ryebank Rife water course approximately 1.3km to the north of the site with two records approximately 750 meters north and the golf course approximately 1.3km to the west.

There are no wet ditches or water courses present upon the site with the potential to support water voles. A ditch is located a few meters beyond the north-western boundary of the site however this did not support water at the time of the survey and is expected to be dry and therefore unsuitable for this species. Approximately 12 meters to the north of the site is a drain located on the other side of Hoe Lane which would act as a barrier to movement and likely prevent any water voles, if present, accessing the site. As a result, it is considered unlikely that this species would be found upon the site at any time.

3.2.8 Protected Invertebrates

A record for small heath, a NERC S41 species, was returned from SxBRC. This record, from 2011 is located approximately 825 meters to the north of the site however the grid reference has poor resolution. The site is considered to be of low importance for this species which favors fine grasses such as fescue, meadow grasses and bent species.

3.2.9 Designated Sites and Wider Ecological Impact Significance

A search was undertaken on the MAgiC website resource (www.magic.gov.uk) and Felpham Site of Special Scientific Interest (SSSI) was identified 2km to the south west (see figure 25 below).

This site is one of the three known to support Palaeocene aged flora in the country within the Reading beds. Palaeocene fossils identified here include leaves, tree stumps, seeds, fern fronds, fruit as well as four new genera and 16 new species yet to be described.

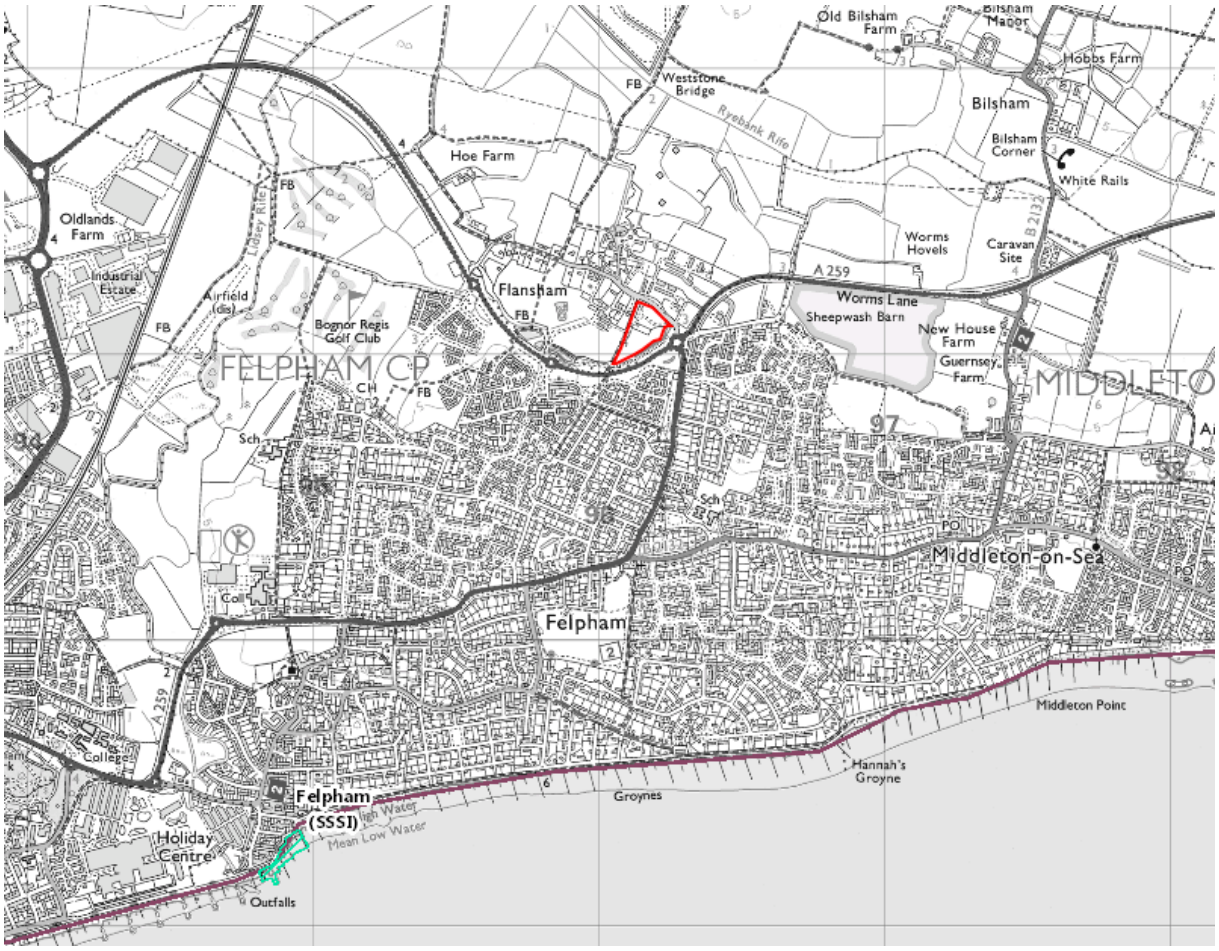

Figure 25. MAgiC map showing the location of Felpham SSSI in relation to the site, with the sites approximate boundaries shown in red.

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.

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4 DISCUSSION AND RECOMMENDATIONS

4.1 Preliminary Ecological Appraisal

The overall ecological value of the majority of the site is low with the majority of the site composed of poor semi-improved grassland, amenity grassland and areas of hard standing with low ecological value. The ruderal habitat and scattered parkland and broadleaved trees have higher ecological value.
Due to the site supporting habitat for great crested newts, reptiles and foraging, commuting and roosting habitat for bat further surveys have been recommended for these 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. However, there are habitats of value for this species adjacent to the site and within the wider landscape. Resultantly a repeat badger check is recommended 8 weeks prior to site clearance and construction. In in the event of a burrow or sett being established it would be necessary to undertake a survey using sand and hair traps.

4.1.2 Bats

Roosting Habitat

The shed has low-negligible potential to support roosting bats given the lack of suitable features both externally and internally with a single wall cavity identified. It is recommended that this feature is observed during one of the bat activity surveys.

The outhouse was concluded under the bat conservation guidelines as having low bat roosting potential with the factory formed roof tiles tight fitting supporting only a couple of lifted tiles and the presence of an inaccessible roof void. As a result, if this building is to be demolished a single bat emergence survey is recommended.

Under the bat conservation trust guidelines the new barn style garage is has moderate potential to support roosting bats given the large number of gaps between the handmade clay roof tiles. At the time of writing this report it is not known if this building is to be demolished as part of the proposals. If plans include demolishing this building two bat emergence surveys are recommended.

A single beech upon the site is concluded under the bat conservation trust guidelines as having moderate bat roosting potential with it support 5 woodpecker holes. As a result, it is recommended that this tree is observed during one of the bat activity surveys.

Foraging Value

Overall the site has low potential to support roosting bats with the scattered broadleaved trees having higher potential as well as the SUDS pond located a few meters form the south-eastern boundary. There are records for a number of bat species with 1km of the site including records for barbastelle. It should be noted however that that site is unlikely to be of value for barbastelle bats which favors woodland habitat.

In line with the bat conservation guideline 3 bat activity surveys are recommended with these to be timed

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across the three seasons; spring (May/April), summer (June/July) and autumn (August/September). In addition to this is a bat loggers should be deployed at the site for a period of 5 days within two seasons.

The information from these surveys will be used to recommended suitable mitigation which is likely to include a no light zone along the south-east boundary of the site where the SUDS ponds are in close proximity. A sensitive lighting plan will need to be produced and can be incorporated into a 'Mitigation Statement'.

4.1.3 Breeding Birds

All of the hedgerows, scattered trees, shrubs and the shed have 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 and concluded clear from active bird's nest. If any active nests are identified a buffer must be created and the nests left alone until the young have fledged.

Despite records for lapwing and skylark being identified within 2km of the site no further surveys are recommended. This is because it is considered unlikely that these species would be found on the site at any time due to the habitat being suboptimal with the grassland field being small in size and disturbed by fairly regular use.

4.1.4 Dormice

The site does not support any suitable habitat for this species with the scattered parkland broadleaved trees and species poor herbaceous hedgerows being unsuitable to support this species. Furthermore, this is no connectivity between these habitats and woodland or hedgerows within the wider landscape with the potential to support dormice. Finally, no records were identified by SxBRC for this species within 2km of the site. Due to this no further surveys are recommended for this species.

4.1.5 Great Crested Newts

No ponds were identified on the site however 7 were identified within 500 meters of the sites boundaries. Ponds 7 and 8 have been scoped out due to the A259 being located between the site and this pond acting as a considerable barrier to movement.

As a recent great crested newt record, from 2016, was identified to be associated with either pond 1 or 2 located to the west of the site a full great crested newt population assessment is recommended on ponds 1, 2, 3, 5 and 6. Due to ponds 3 and 5 having very low water level it will not be possible to bottle trap them but egg searching and torching can be undertaken. Pond 4 is dry, as unsuitable to support great crested newts and as a result has been scoped out.

The population survey follows 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°C 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.

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Should great crested newts be identified at the site a full population assessment would be necessary to inform an application for a licence from Natural England to permit the development which in this instance would have the potential to injure and kill individuals and disturb and destroy potential foraging habitat.

4.1.6 Reptiles

The site is suitable for reptiles with the species poor improved grassland and ruderal habitat providing suitable cover from predators for this group of species and the close by ponds supporting suitable amphibian prey for grass snakes. There are also a number of suitable hibernacula located within the sites boundaries.

Due to the site supporting suitable habitat and hibernacula for this group of species are records for slow worms being identified within 2km of the site it is important that the used of the site by reptiles (if any) is understood so that if necessary, an appropriate mitigation strategy can be produced. Mitigation strategies are designed according to both the species, population and distribution of reptiles across the site and a reptile presence/absence survey is would be recommended to gather this information is required.

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 thus survey are April, May and September.

Should reptiles be identified at the site suitable mitigation would need to be outlined and put in place which could include a reptile translocation.

4.1.7 Water Voles

A number of water vole records were identified within 2km of the site however there are no wet ditches or water courses present upon the site and the ditch located a few meters beyond the north-western boundary did not support water at the time of the survey and is expected to be dry most of the year and there for unsuitable for this species, which has a strong association with still and slow-flowing waterbodies. Approximately 12 meters to the north of the site is a drain located on the other side of Hoe Lane which would act as a barrier to movement and likely prevent any water voles, if present, accessing the site when young voles spread out from maternity burrows. As a result, it is considered unlikely that this species would be found upon the site at any time and no further surveys are recommended.

4.1.8 Protected Invertebrates

A record for small heath, a NERC S41 species, was returned from SxBRC. However, the site is considered to be of low importance for this species which favors fine grasses such as fescue, meadow grasses and bent species. As a result, no further surveys are recommended.

4.2 Development Impact Assessment

This development would see the loss of some species poor semi-improved grassland, amenity grassland, ruderal habitat and areas of hard standing with low ecological value. Some scattered

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parkland and broadleaved trees will also be lost as part of the development. The shed on the north-western boundary is to be demolished and it is possible that the barn style garage and outhouse could be demolished too.

A 'Mitigation Statement' should be produced once the recommended phase 2 surveys have been completed. This should outline a range of suitable ecological enhancement measures to benefit wildlife at the site such as the planting of species rich hedgerows.

The development is unlikely to have an impact upon the Felpham Site of SSSI identified 2km to the south west.

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 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.

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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.

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6 APPENDIX 2 - ARTIFICAL 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 season[3]. 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

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[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

[2] 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

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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 cross[5]. 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) process[6]. 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:

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[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

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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 Plans[8]. 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

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http://planningguidance.planningportal.gov.uk/blog/guidance/light-pollution/when-is-light-pollution-relevant-to-planning/[7] 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