



Building B, Lords Wood Barns, Petworth, GU28 9BS

Tel: 01798 861 800 - E-Mail: info@ecologyco-op.co.uk - Web: www.ecologyco-op.co.uk

Preliminary Ecological Appraisal

Land South of Lyne House, Worthing

Author: Nick Bayne MSci, QCIEEM

Reviewed by: Emma Baker MSc ACIEEM

Project No: 5005

The Ecology Co-operation Ltd
Registered Office: Greens Court, West Street, Midhurst, West Sussex, GU29 9NQ
Company number: 8905527



Document Control

Issue No	Author	Reviewer	Issue Date	Additions/alterations	Notes
Original	NB	EB	13/07/2022	N/A	

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.



Report Summary

1. The Ecology Co-op has been commissioned by Mr Tim Rodway to undertake a Preliminary Ecological Appraisal at land south of Lyne House, Links Road, Worthing. A site walkover survey visit was carried out by Nick Bayne MSci, a qualifying member of CIEEM on 10th June 2022, to evaluate the habitat value of the site and its potential to support EU and UK protected/notable species. The purpose of this report is to record the findings of the survey and identify potential ecological constraints and opportunities in relation to a proposal to construct two five-bedroom dwellings with associated hard and soft landscaping.
2. The site is currently comprised of predominantly mown lawn with large shrubs interspersed within it. Large beech trees shade much of the southern and western areas of the site. A pile of felled cypress trees is present at the south of the site. A small pond is present adjacent to the north-western site boundary and there is suitable habitat for amphibians within the site boundary.
3. Two statutory designated sites are located within 2km of Lyne House, the closest is South Downs National Park which is present to the east in the form of Worthing Golf Club. Cissbury Ring Site of Special Scientific interest (SSSI) is approximately 1.4km north.
4. The site supports suitable reptile habitat in the form of timber piles and rough grassland and scrub. Records for reptiles were also returned within 2km, increasing the likelihood that the site supports reptiles. It is therefore recommended that reptile presence/likely absence surveys are carried out to determine the use of the site by reptiles. The site also supports suitable great crested newt terrestrial habitat which is planned to be impacted by the work. Samples of the pond water on the north-western boundary were taken and analysed for great crested newt eDNA.
5. It is recommended that the western boundary is enhanced by the planting of a wildflower strip and hedgerow to increase connectivity around the site and provide a greater range of habitats. A reptile hibernaculum is also recommended for the south-western corner of the site to replace the log piles currently occupying the southern boundary. Any fences installed on the site should have small holes cut somewhere along the base in order to allow hedgehog movement around and through the site.



CONTENTS PAGE

1	INTRODUCTION	1
1.1	Purpose of the Report	1
1.2	Background	1
1.3	Policy and Legislation	3
2	METHODOLOGY	3
2.1	Desk Study	3
2.2	Field Survey	3
2.3	Badgers	4
2.4	Bats	4
2.5	Breeding Birds	5
2.6	Dormice	5
2.7	Great Crested Newt	5
2.8	Reptiles	5
2.9	Other Notable Species	6
3	BASELINE CONDITIONS	6
3.1	Designated Sites and Granted EPS Licences	6
3.2	Habitats	10
3.3	Badgers	14
3.4	Bats	14
3.5	Breeding Birds	14
3.6	Dormice	14
3.7	Great Crested Newts and other Amphibians	15
3.8	Reptiles	15
3.9	Invasive Non-native Species	15
3.10	Other Notable Species	15
3.11	Survey Limitations	16
4	IMPACT APPRAISAL	16
4.1	Designated Sites	17
4.2	Habitats	17
4.3	Badgers	17
4.4	Bats	17
4.5	Breeding Birds	17
4.6	Dormice	18
4.7	Great Crested Newts	18
4.8	Reptiles	18
4.9	Invasive Non-native Species	19
4.10	Other Notable Species	19
5	OPPORTUNITIES FOR ENHANCEMENT	19
6	CONCLUSIONS	20
	APPENDIX 1 – Wildlife Legislation and National Planning Policy	22
	APPENDIX 4 – Adur and Worthing Borough Council Local Plan	26
	APPENDIX 3 – Great crested newt ‘Habitat Suitability Index’ values	28



APPENDIX 4 – Reducing Impacts of Artificial Light	29
--	-----------



1 INTRODUCTION

1.1 Purpose of the Report

The Ecology Co-op has been commissioned to undertake a Preliminary Ecological Appraisal (PEA) of land south of Lyne House, Links Rd, Worthing by Mr Tim Rodway of Rodway Planning Consultancy Ltd. This report presents the findings of a walkover survey undertaken by Nick Bayne, a qualifying member of the Chartered Institute of Ecology and Environmental Management (QCIEEM), on the 10th June 2022. It provides details on the potential for any protected/notable species and/or habitats to be present at the site and a simple assessment of the potential ecological constraints and opportunities in relation to the construction of two dwellings and an access road from Links Road. Recommendations for further surveys that are likely to be required to inform a planning application and Ecological Impact Assessment (EclA) of the proposal are provided where necessary, and possible measures to avoid, mitigate and/or compensate for significant adverse effects are summarised. The potential to incorporate ecological enhancement measures as part of the scheme is discussed, in addition to any requirement to achieve biodiversity net gain.

This PEA report is designed to inform the client and their team (as appropriate) about the initial findings of the site walkover and desk study research in relation to the site proposals, highlighting the key ecological constraints and opportunities, and any further survey requirements. It is not intended for submission in support of a planning application but can be used to inform a future Ecological Impact Assessment (EclA).

1.2 Background

The site measures 0.2ha and is situated on the northern end of Links Road, in the north of Worthing, West Sussex, BN14 9QY. The site is located in a semi-urban area bounded by low and moderate density housing to the west and Worthing Golf Club to the east. Figure 1 shows the boundary of the site.

The proposed development/project includes development of the site to support two five-bedroom, dwellings each with associated hard and soft landscaping, including an access road to Links Road. Figure 2 shows the plans for the site.



Figure 1. An aerial image showing the location of the site. The approximate site boundary is outlined in red. Image produced courtesy of Google maps (map data ©2022 Google).



Figure 2. Development layout plan for Lyne House, Worthing. Architectural Design LLP, drawing number 2194(11)001. Right, red line indicates redline boundary for the site and the blue outline indicates the new boundary for Lyne House.



1.3 Policy and Legislation

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

Where possible, this report provides guidance on how the proposal can be designed to meet the requirements of both local planning policy and the National Planning Policy Framework (NPPF). Details of the NPPF can be found in Appendix 1 and relevant local planning policy by Adur and Worthing Borough Council is provided in Appendix 2.

2 METHODOLOGY

The methodologies used for this survey are in accordance with the Guidelines for Preliminary Ecological Appraisal¹, but also consider the Guidelines for Ecological Report Writing, Second Edition².

2.1 Desk Study

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

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

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

2.2 Field Survey

A site walkover survey was undertaken on 10th June 2022, during which the habitats contained within the site were described and evaluated. Since this site is relatively small in scale and contains limited semi-natural habitat diversity, it was not considered necessary to undertake comprehensive UKHab mapping of the site. All habitat types contained within the site, together with the dominant botanical

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

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



species and indicators of important habitat types, such as ancient woodland or unimproved grassland, have simply been listed and described where identified.

Habitats and features at the site were evaluated for their potential to support legally protected species and/or species of conservation interest. In addition, observations of any important plant communities, bird assemblages or other potentially valuable ecological features were recorded.

Details of the preliminary survey methods for each legally protected species are given below. Any site-specific limitations to the survey, e.g. access constraints or seasonal constraints, are set out in section 3.11.

2.3 Badgers

Badgers *Meles meles* exploit a range of habitats, including gardens, coniferous woodland, deciduous woodland, mixed woodland and arable land. They live in an underground system of tunnels and nesting chambers, known as a sett, with territories ranging from 30ha to 150ha or more.

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

2.4 Bats

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

A ground level tree inspection was carried out in accordance with best practice guidance as set out by the Bat Conservation Trust³; the inspection comprised identification of potential access points and 'Potential Roost Features' (PRFs) that bats could use and any evidence indicating the presence of bats using the building, such as rub marks. The survey included using a high powered torch to identify any features that could be observed from ground level.

The potential for roosting bats for each feature, or group of features was assessed as negligible, low, moderate, or high, in accordance with best practice. Any evidence confirming the presence of bats was clearly recorded including photos and samples taken (e.g. rub marks and droppings), where appropriate.

The habitats surrounding the site and wider landscape were broadly assessed for their potential to support foraging and commuting bats.

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



2.5 Breeding Birds

Birds can use a wide range of natural and artificial habitats when breeding, including trees, hedgerows, fields, houses and garden sheds. The habitats contained within the site and adjacent areas were broadly assessed for their potential to support important bird species/assemblages, and breeding birds. Any birds identified during the site visit were recorded. Special attention was paid to notable species such as red-listed Birds of Conservation Concern⁴ and those species afforded special protection on Schedule 1 of the Wildlife and Countryside Act (1981).

2.6 Dormice

Dormice are found in deciduous woodland and hedgerows, feeding on flowers, pollen, fruits, insects and nuts, favouring hazel *Corylus avellana* and honeysuckle *Lonicera periclymenum* for food and as bedding. The site was broadly assessed for its potential to support dormice. This included use of on-line mapping resources to assess the surrounding area for connectivity to large blocks of woodland, scrub and extensive hedgerow networks.

2.7 Great Crested Newt

Great crested newts breed in ponds during the spring and spend the rest of the year feeding on invertebrates primarily in semi-natural habitats including woodland, hedgerows, marshes and tussocky grassland. A desk study was undertaken to identify ponds and wet ditches within 500m of the site that might support breeding great crested newts. Where access permission was granted, or ponds could be viewed from public roads or footpaths, the ponds were assessed for their potential to support great crested newts using the Habitat Suitability Index (HSI) (Oldham et al 2000)⁵. The value of the site for terrestrially foraging great crested newts and any features that might be used by hibernating newts has also been assessed.

Further surveys are recommended as appropriate, in accordance with best practice guidance (English Nature 2001)⁶.

2.8 Reptiles

The common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix helvetica* and adder *Vipera berus* are widespread species that can be found in any of these habitats, whereas smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis* have much more restricted and isolated populations on lowland heathland and sand dunes.

⁴ Stanbury, A., Eaton, M., Aebischer, N., Balmer, N., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021). Birds of Conservation Concern 5: the status of bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man. *British Birds* 114, pp 723-747.

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



Habitats on the site were broadly assessed for their potential to support reptiles. Particular attention was paid to those features that provide suitable basking areas (e.g. south-facing slopes), hibernation sites (e.g. banks, walls, piles of rotting vegetation) and opportunities for foraging (rough grassland and scrub). Further surveys are recommended as appropriate.

Any existing refugia such as the timber pile at the south of the site were searched for presence of reptiles and any observations of reptiles recorded.

2.9 Other Notable Species

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

3 BASELINE CONDITIONS

3.1 Designated Sites and Granted EPS Licences

There are two designated sites within 2km of the application site (Figure 3). The closest is the South Downs National Park; 40m to the east. The other designated site is Cissbury Ring, a Site of Special Scientific Interest (SSSI), 1.5km to the north.

Within 2km of the site, there are nine non-statutory designated sites. All of these are Local Wildlife Sites (LWS) apart from two Local Geological Sites (LGS). Full details of these sites are described in Table 1 and locations are indicated in Figure 4.

There are no granted EPS licences for mitigation projects within 1km of the site boundary. The closest EPS licence to the site concerns the destruction of a resting place for great crested newts, 2.5km west, in October 2020.

Table 1. Designated sites within 2km of the application site.

Site name	Designation	Features listed on citation	Proximity
Statutory designated sites			
South Downs	National Park	This is a landscape of national importance. Habitats present include ancient woodland, river valleys, chalk grassland, heathland, meadows and farmland. The Park supports a number of threatened and nationally scarce species, including round-headed rampion <i>Phyteuma orbiculare</i> , otter <i>Lutra lutra</i> and barbastelle bat <i>Barbastella barbastellus</i> .	40m east
Cissbury Ring	SSSI	This site is designated because of its archaeological importance. Unimproved chalk grassland is present on the siter and is nationally rare, with scrub providing habitats for	1.5km north



		wintering, breeding, and migrant birds and varied butterflies.	
Non-statutory designated sites			
Worthing and Hill Barn Golf Courses	LWS	A 205.2ha area of species rich unimproved chalk grassland habitat, mixed chalk scrub and woodland. There are many invertebrates and bird species that have been observed over the golf course, including skylarks <i>Alauda arvensis</i> , grey partridge <i>Perdix perdix</i> , green hairstreak <i>Callophrys rubi</i> , dark green fritillary <i>Speyeria aglaja</i> .	0.05km east
Offington Cemetery	LWS	This site is a large area of unimproved calcareous herb-rich grassland. Some of the site contains rank and disturbed grassland but is predominantly unimproved grassland.	0.5km west
The Gallops & No Man's Land	LWS	19ha of calcareous grassland, broadleaved woodland, rank grassland and dense scrub. Woodland at the north of the site provides connectivity for the wider landscape.	0.5km west
Tenants Hill and Reservoirs	LWS	A 16.8ha area of species-rich unimproved chalk grassland habitat predominantly on a steep east-facing slope. Two reservoirs on site are connected by a strip of scrub and herb-rich glades.	1.2km east
Charmandean Quarry	LGS	A 150m long x 40m wide disused quarry, designated for its geological and educational value.	1.4km east
Long Furlong and Church Hill	LWS	Rich chalk grassland and scrub make up this 68ha site. Grassland contains species such as quaking grass <i>Briza media</i> , cowslip <i>Primula veris</i> , stemless thistle <i>Cirsium acaule</i> , round-headed Rampion, salad burnet <i>Sanguisorba minor</i> . The variety of habitat and vegetation structure makes the site important for invertebrates and birds.	1.6km northwest
The Sanctuary	LWS	A 20ha area of lowland mixed deciduous woodland and chalk grassland.	1.6km northwest
Cote Bottom	LGS	This disused quarry exposes Culver chalk formations and is designated for its geological and educational value.	1.85km west
Clapham Wood	LWS	A 152ha section of woodland connected to additional woodland in the area. much of the woodland is ancient and semi-natural comprised of hazel coppice <i>Corylus avellana</i> , ash <i>Fraxinus excelsior</i> and pedunculate oak <i>Quercus robur</i> .	1.9km west

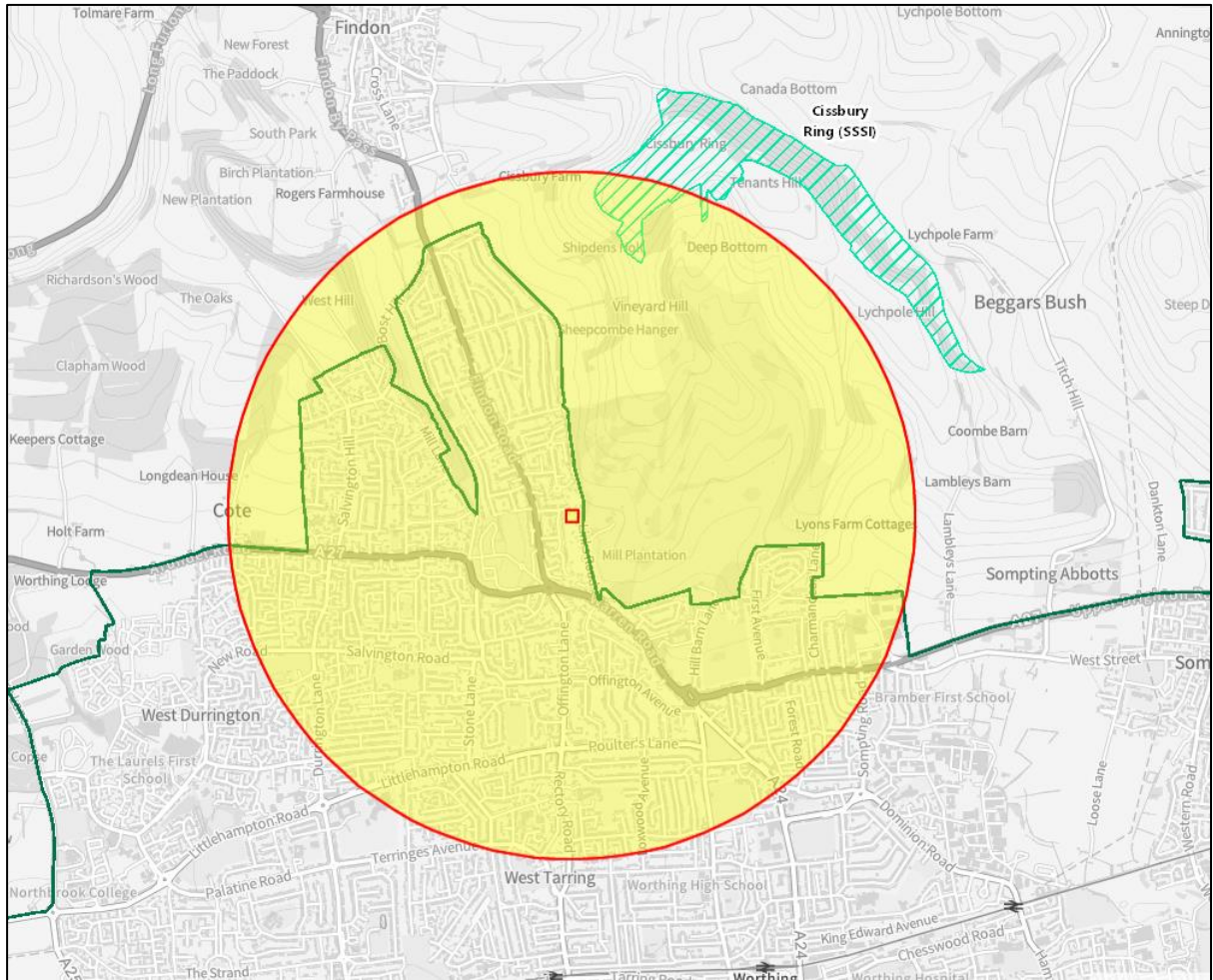


Figure 3. Statutory designated sites within a radius of 2km of the application site (shown in red). The green lines indicate the outline of South Downs National Park and the turquoise hashed area indicates Cissbury Ring SSSI. Image produced courtesy of Magic maps (<http://www.magic.gov.uk/>), contains public sector information licensed under the Open Government Licence v3.0).

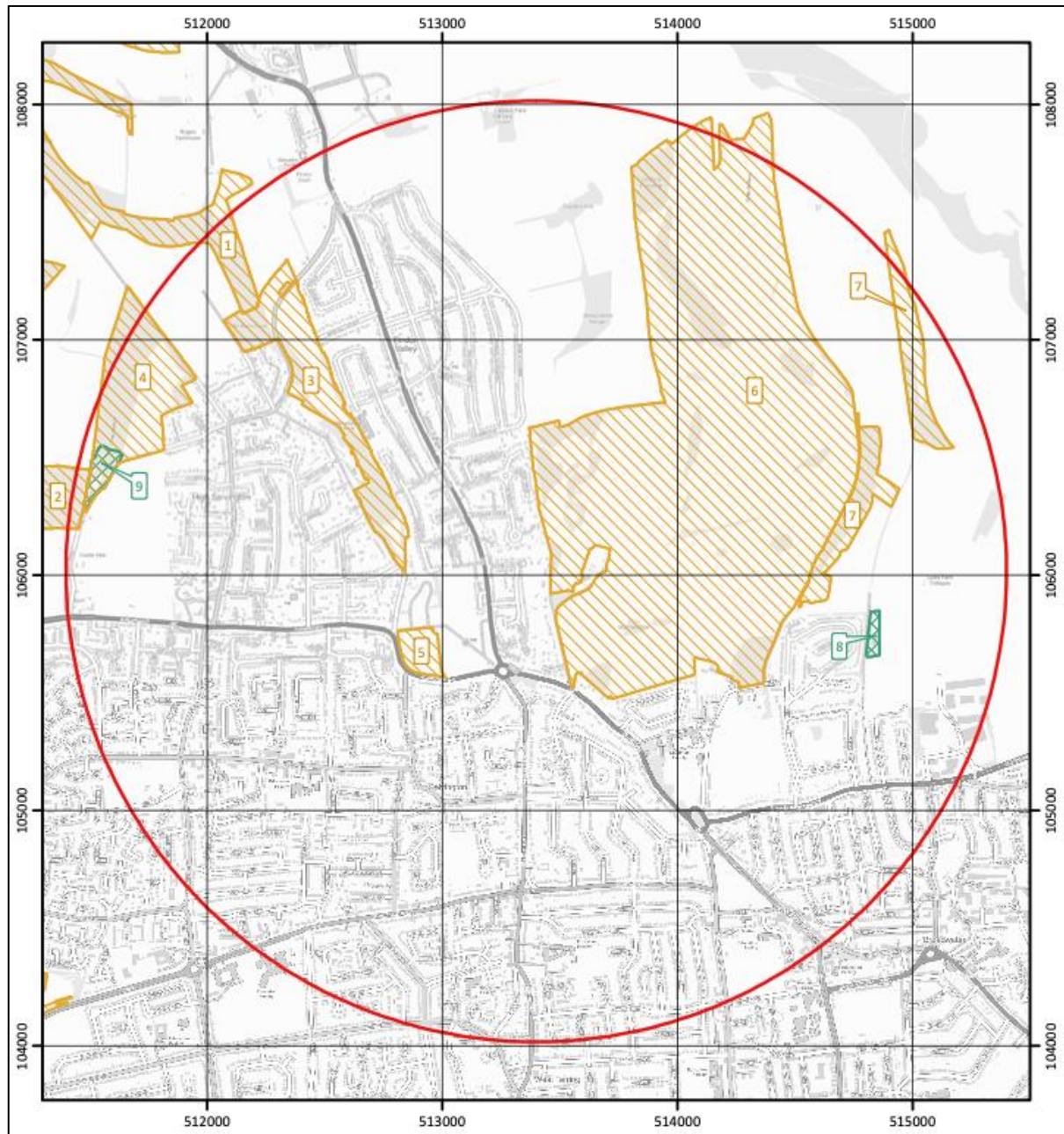


Figure 4. Non-statutory designated sites within a 2km radius around Lyne House. 1 – Long Furlong and Church Hill, 2 – Clapham Wood, 3 – The Gallops and No Man's Land, 4 – The Sanctuary, 5 – Offington Cemetery, 6 – Worthing & Hill Barn Golf Courses, 7 – Tenants Hill and Reservoirs, 8 – Charmandean Quarry, 9 – Cote Bottom. Provided courtesy of SxBRC.

3.2 Habitats

The site comprises of a garden that has been left to grow wilder in areas, specifically the southern and western sections of the site (Photograph 1). The main section of the garden is amenity grassland that has three large Portuguese laurel shrubs *Prunus lusitanica* dotted within it (Photograph 2). The grassland itself contains a number of grasses and flowering species including smooth meadow grass *Poa pratensis*, perennial rye *Lolium perenne*, false oat grass *Arrhenatherum elatius*, cock's-foot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus*, yarrow *Achillea millefolium*, mouse-ear hawkweed



Pilosella officinarum, red clover *Trifolium pratense*, white clover *trifolium repens*, bird's-foot trefoil *Lotus corniculatus*, germander speedwell *Veronica chamaedrys*, meadow buttercup *Ranunculus acris*, field bindweed *Convolvulus arvensis*, cut-leaved cranesbill *Geranium dissectum*, ribwort plantain *Plantago lanceolata*, smooth cat's ear *Hypochaeris glabra*, and field madder *Sherardia arvensis*.

The southern and western sections are more overgrown with the western section being more of a woodland habitat with a large copper beech *Fagus sylvatica* shading most of the area (Photograph 3). There are also sycamore saplings *Acer pseudoplatanus*, hawthorn saplings *Crataegus monogyna*, elder saplings *Sambucus nigra*, ivy *Hedera helix*, bramble *Rubus fruticosus*, cleavers *Galium aparine*, perennial sow thistle *Sonchus arvensis*, French cranesbill *Geranium endressii*, and trailing bellflower *Campanula poscharskyana*. Most of these flowering species are located on the border of the wooded section and the grassland area, as in the shaded area only ivy and occasional saplings are growing (Photograph 4). The southern section of the site is the most botanically diverse and is comprised of rough grassland and scrub habitat with stumps from felled cypress trees and the associated logs nearby in one pile (Photograph 5). Species in this area include bladder campion *Silene vulgaris*, oxeye daisy *Laucanthemum vulgare*, bramble, scarlet pimpernel *Anagallis arvensis*, wood avens *Geum urbanum*, spear thistle *Cirsium vulgare*, common ragwort *Jacobaea vulgaris*, hedge bindweed *Calystegia sepium*, red valerian *Centranthis ruber*, garlic mustard *Alliaria petiolata*, purple toad flax *Linaria purpurea*, lady's bedstraw *Galium verum*, yarrow, cow parsley *Anthriscus sylvestris*, and smooth sow thistle *Sonchus oleraceus*.

Adjacent to the northern site boundary is a pond that is not due to be impacted by the development (Photograph 6). Much of the pond is overgrown and surrounded by a thin margin of rough habitat which is then surrounded by mown amenity grassland.

Hedgerows surrounding the site (Photograph 7) consist of cypress hedgerow *Cypress sp.*, buddleia *Buddleja davidii*, and beech. These hedgerows connect the site to the wider landscape through joined gardens and associated hedgerows, however, these connect to only a limited amount of woodland. Species supported by the high-quality grassland connected to the north of the site are unlikely to move far enough through gardens into land at Lyne House.



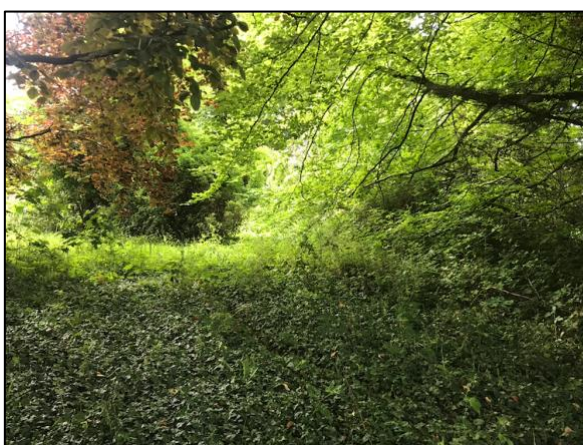
Photograph 1. Left, the southern boundary of the site, with felled cypress trees and rough scrub and grassland, seen from the western end. Right, the south-western corner of the site.



Photograph 2. Amenity grassland making up the majority of the site, with three Portuguese laurels breaking up the area, and many forbs present.



Photograph 3. The large copper beech shades most of the western section of the site but has a range of saplings and flowering forb species around the edge of the shade.



Photograph 4. Shaded area around the western section. Most of the ground flora is comprised of ivy but some saplings and woodland species have persisted.



Photograph 5. Southern section of the site. Left - this section is very biodiverse with many different forb species, seen from the south-eastern corner of the site. Right - the pile of felled cypress trees running along the southern boundary, seen from the south-western corner of the site.



Photograph 6. The pond on the north-western boundary of the site.





Photograph 7. Examples of the hedgerows and boundaries present at the site (top), these are varied but include cypress and buddleia on the eastern boundary, and a mixture of cypress and beech on the western boundary, while the southern boundary is predominantly fenced. The existing access to the site is also shown (bottom).

3.3 Badgers

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

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

3.4 Bats

There are no buildings on site. Two large beech trees are the only trees large enough to support roosting bats, but these were found to have a negligible potential to support bats as no crevices or potential roosting features were observed.

The site may be used by foraging and commuting bats as it is partially connected to the wider landscape through hedgerows and tree lines, especially on the western boundary of the site. However, it is considered unlikely to be a key habitat for foraging and commuting bats as there is more valuable habitat nearby to the east in the form of linear sections of woodland on Worthing Golf Course and priority deciduous woodland to the north and south. It is possible commuting bats would use the tree line on the western and eastern boundaries to navigate along the site.

The SxBRC search indicates the presence of 22 bat records including four species within 2km of the site.



3.5 Breeding Birds

The bramble scrub, semi-mature trees and occasional mature trees all have the potential to support a variety of common nesting birds. Although brief searches for nesting birds were carried out no nests or birds were identified onsite.

The SxBRC search indicates the presence of a diverse assemblage of bird species within 2km of the site. The vast majority of these are not relevant to this site as there is no suitable habitat present to support them. Common garden birds may be present at the site supported by the shrubs and hedgerow.

3.6 Dormice

Whilst the site contains a small amount of bramble scrub and hedgerows, this is generally isolated from the wider landscape and is small in area so the species is highly unlikely to be present.

The SxBRC biological record centre identified no dormouse records in the search area.

3.7 Great Crested Newts and other Amphibians

A single pond is present, adjacent to the north-western boundary of the site, grid reference TQ 13394 06030. A desk study search indicated an absence of other ponds within 500m. The pond scored 'below average' in the HSI conducted, largely because of the size of the pond and lack of ponds in the area (see Appendix 3 for full results). However, it is possible garden ponds and small ponds may be missed on mapping. Despite this, the pond still has the potential to support species such as great crested newts, common toad *Bufo bufo* and common frog *Rana temporaria*, these species would likely only be using habitat on the western section of the site that is due to be impacted by the development. Due to the relatively urban area the pond sits in there is little suitable habitat present and it is not well connected so it is considered unlikely these protected species will be supported by the pond and the site.

The SxBRC biodiversity records search indicates the presence of a single great crested newt record from March 2020, 1.8km northwest of the site. There are also 11 records for the common toad *Bufo bufo*, 48 for the common frog *Rana temporaria*, 24 for smooth newts *Lissotriton vulgaris* and one for palmate newts *L. helveticus*.

3.8 Reptiles

Whilst most of the grassland present within the boundary is mown amenity grassland the longer grassland and scrub around the boundary, especially to the west and south is potentially suitable for common reptile species, particularly common lizard and slow worm, owing to the presence of favourable habitats. The most suitable part of the site is the piles of felled cypress trees at the southern boundary, this provides a large area resembling an artificial hibernaculum, that will likely be used if reptiles are present at the site.



In total the SxBRC search returned 27 records for slow worms, 16 records for adders *Viper berus*, 10 records for grass snakes, nine for common lizards, and one for a sand lizard *Lacerta agilis*.

3.9 Invasive Non-native Species

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

The SxBRC search indicates the presence of many non-native invasive species within 2km of the site. The most common of which is the harlequin ladybird *Harmonia axyridis* with 16 records, the horse-chestnut leaf-miner *Cameraria ohridella* and the ring-necked parakeet *Psittacula krameria* both had 13 records, whilst cherry laurel *Prunus laurocerasus* and the eastern grey squirrel *Sciurus carolinensis* both had 11. The vast majority of the non-native invasive species records are plant species.

3.10 Other Notable Species

The SxBRC search indicated the presence of hedgehog *Erinaceus europaeus*; returning 72 records of the species with a maximum abundance of 13. Due to suitable habitat present at the site, notably in the form of the timber piles formed from the felled cypress tree, it is possible that this species is present.

The SxBRC search returned records for stag beetle *Lucanus cervus*, Small heath butterfly *Coenonympha pamphilus*, small blue Cupido minimus, dingy skipper *Erynnis tages tages*, white admiral *Limenitis camilla*, grizzled skipper *Pyrgus malvae*, white-letter hairstreak *Satyrrium w-album*, brown hairstreak *Thecla betulae*.

The majority of the NERC S41 species are moth species, these include, Grey Dagger *Acronicta psi*, Knot grass *Acronicta rumicis*, beaded chestnut *Agrochola lychnidis*, green-brindled crescent *Allophyas oxyacanthae*, ear moth *Amphipoea oculatea*, mouse moth *Amphipyra tragopoginis*, brown-spot pinion *Anchoscelis litura*, dusky brocade *Apamea remissa*, deep-brown dart *Aporophyla luteolata*, garden tiger *Arctia caja*, centre-barred sallow *Atethmia centrargo*, mottled rustic *Caradrina Morpheus*, latticed heath *Chiasmia clathratea*, dusky-lemon sallow *Cirrhia gilvago*, sallow *Cirrhia icteritia*, small square-spot *Diarsia rubi*, figure of eight *Diloba caeruleocephala*, small phoenix *Ecliptopera silaceata*, september thorn *Ennomos erosaria*, dusky thorn *Ennomos fuscantaria*, august thorn *Ennomos quercinaria*, gallium carpet *Epirrhoe galiata*, autumnal rustic *Eugnorisma glareosa*, spinach *Eulithis mellinata*, white-line dart *Euxoa tritici*, small emerald *Hemistola chrysoprasaria*, ghost moth *Hepialus humuli*, rosy rustic *Hydraecia micacea*, shoulder-striped wainscot *Leucania comma*, rosy minor *Litologia literosa*, brindled beauty *Lycia hirtaria*, dot moth *Melanchra persicariae*, pretty chalk carpet *Melantheria procellata*, powdered quaker *Orthosia gracilis*, dark spinach *Pelurga comitata*, grass rivulet *Perizoma albulata*, mullein wave *Scopula marginipunctata*, shaded broad-bar *Scotopteryx chenopodiata*, white ermine *Spilosoma lubricipeda*, buff ermine *Spilosoma lutea*, hedge rustic *Tholera cespitis*, feathered gothic *Tholera decimalis*, blood-vein *Timandra comae*, barred tooth-striped *Trichopteryx polyommata*, olive crescent *Trisateles emortualis*, cinnabar *Tyria jacobaeae*, oak hook-tip *Watsonalla binaria*, dark-barred twin-spot carpet *Xanthorhoe ferrugata*, and heath rustic *Xestia*



agathina.

3.11 Survey Limitations

An initial site assessment such as this is only able to act like a 'snapshot' to record any flora or fauna that is present at the time of the survey. It is therefore possible that some species may not have been present during the survey, but may be evident at other times of the year. For this reason, habitats are assessed for their potential to support some species, even where no direct evidence has been found.

4 IMPACT APPRAISAL

4.1 Designated Sites

South Downs National Park is located 40m east of the site, meaning it is likely the two additional dwellings will use the national park for recreational purposes. However, due to the small scale of the development and the number of houses already within the immediate surrounding area, this additional visitation is thought to only lead to a very minimal increase in recreational pressure.

During the construction phase, there is likely to be significant amounts of noise and dust created. However, as the site is enclosed by gardens and tall hedgerows, this should be greatly reduced away from the site boundary. To the east, the direction of the South Downs National Park, a golf course will increase the distance between the site and any high value habitat the park has to offer. For these reasons, noise and dust pollution is not thought to be mechanisms for impact on the national park.

4.2 Habitats

No further habitat surveys are required. Much of the amenity grassland will be lost as a result of the development but this is of low ecological value. Most of the rough grassland will be lost around the boundaries of the site and the pile of felled cypress trees will be removed, these features are of high ecological value and are likely to support a range of common reptiles and amphibians. The treelines and hedgerows around the site are to be retained so can continue to provide commuting features for bats. However, hedgerow at the northern end of the site will be heavily impacted and partly removed to gain access to the site. The Portuguese laurel bushes are to be removed, potentially reducing the amount of nesting bird habitat, without appropriate mitigation. With the methods set out in Section 5, the removal and disturbances to these habitats should be adequately addressed.

4.3 Badgers

No signs of badger activity were identified during the assessment and no badger setts are situated on or near to the proposed construction zone. No further surveys or mitigation for badgers is advised, however, if any signs of digging by large animals is identified on or near to the site in the future, prior to development or the submission of a planning application, further surveys would likely be required.



4.4 Bats

In accordance with the Bat Conservation Trust guidelines, the overall potential for the site to support roosting bats is rated as 'negligible' as no features were identified in any trees or structures that could support roosting bats. The hedgerows and more wooded habitats at the site are likely to be used by foraging and commuting bats as part of a wider resource across the landscape. However, the plans indicate that these features will be retained. Therefore, no further surveys are required with regards to bats.

To reflect the risk the site may be used by foraging and commuting bats, it is important that the potential for disturbance from artificial lights is considered. The proposed development is likely to require an 'ecologically sensitive lighting scheme' in accordance with guidance produced by the Bat Conservation Trust (summarised in Appendix 4).

4.5 Breeding and Wintering Birds

There is a possibility the trees and shrubs planned to be removed, namely the Portuguese laurel and hedgerow at the north of the site where the access road is planned, could support breeding birds. However, none were seen during the assessment. To reflect this risk, any trees and shrubs should be removed outside of the birds breeding season (avoiding 1st March – 31st August). If this is not possible, all trees and shrubs to be removed should be inspected by a qualified, trained ecologist prior to removal.

4.6 Dormice

The proposed development is highly unlikely to impact dormice given the absence of suitable habitats for this species and no further surveys are recommended.

4.7 Great Crested Newts

Whilst it is considered unlikely for the pond on the north-eastern boundary to support great crested newts this cannot be ruled out with certainty. The works to construct the new dwellings will result in the disturbance of the pond and suitable terrestrial habitats for amphibians. Where possible, this habitat should be retained and enhanced by the planting of woodland wildflowers and scrub. This can be a small area but should extend the length of the site to retain what connectivity the site has to the wider landscape to the south.

Due to the proximity of the pond to the site and the scrub habitat to be removed by the works, eDNA analysis of the pond has been undertaken. If the result is negative, then no further surveys will be required. However, if it is positive then population surveys will likely be required to determine the importance of the pond for the species and the population size.



4.8 Reptiles

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

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

The log piles at the south of the site provide high quality reptile habitat so it is very possible reptiles will be present at the time of removal. To negate the impact of the removal of this habitat is recommended the timber is removed during the winter months (October – March) and done so by hand by a suitably qualified ecologist once the reptile survey has been completed.

4.9 Invasive Non-native Species

No invasive non-native species were present on-site so no mitigation or eradication measures are necessary.

4.10 Other Notable Species

The site, especially the southern and western sections of the site, has the potential to support hedgehogs. As with the potential for great crested newts, this should be managed by retaining and where possible enhancing the rough grassland habitat on the western boundary. In addition to this, any fences that are constructed on site should have a small hole somewhere at the base (13cm x 13cm) to increase connectivity around the site and to the wider landscape for hedgehogs.

5 OPPORTUNITIES FOR ENHANCEMENT

The proposed development represents an opportunity for habitat enhancement to benefit insects, birds, and bats. The greatest enhancement is likely to come from retaining and increasing value of the western boundary, as this boundary has most connectivity to the wider landscape. This boundary should be subject to supplementary planting of hedgerow, consisting of flowering, native species such as hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, hazel *Corylus avellana*, and rose species *Rosa* sp.. Ideally this will connect to hedgerow separating the dwellings and therefore increase the connectivity around the site. It is also recommended the western boundary is planted with woodland wildflowers, such as Woodland Mixture E1, this will increase the number and diversity of invertebrates present, which will provide foraging grounds for bats and birds, while also increasing the value of the reptile habitat present.



Due to the log pile at the southern boundary being removed as part of the works, it is recommended a reptile hibernaculum is installed in the south-western corner of the site. This should be connected to the hedgerow and wildflower strip on the western boundary and can be formed of a log pile covered in grass cuttings and any brash from the removal of shrubs and trees (Figure 6).

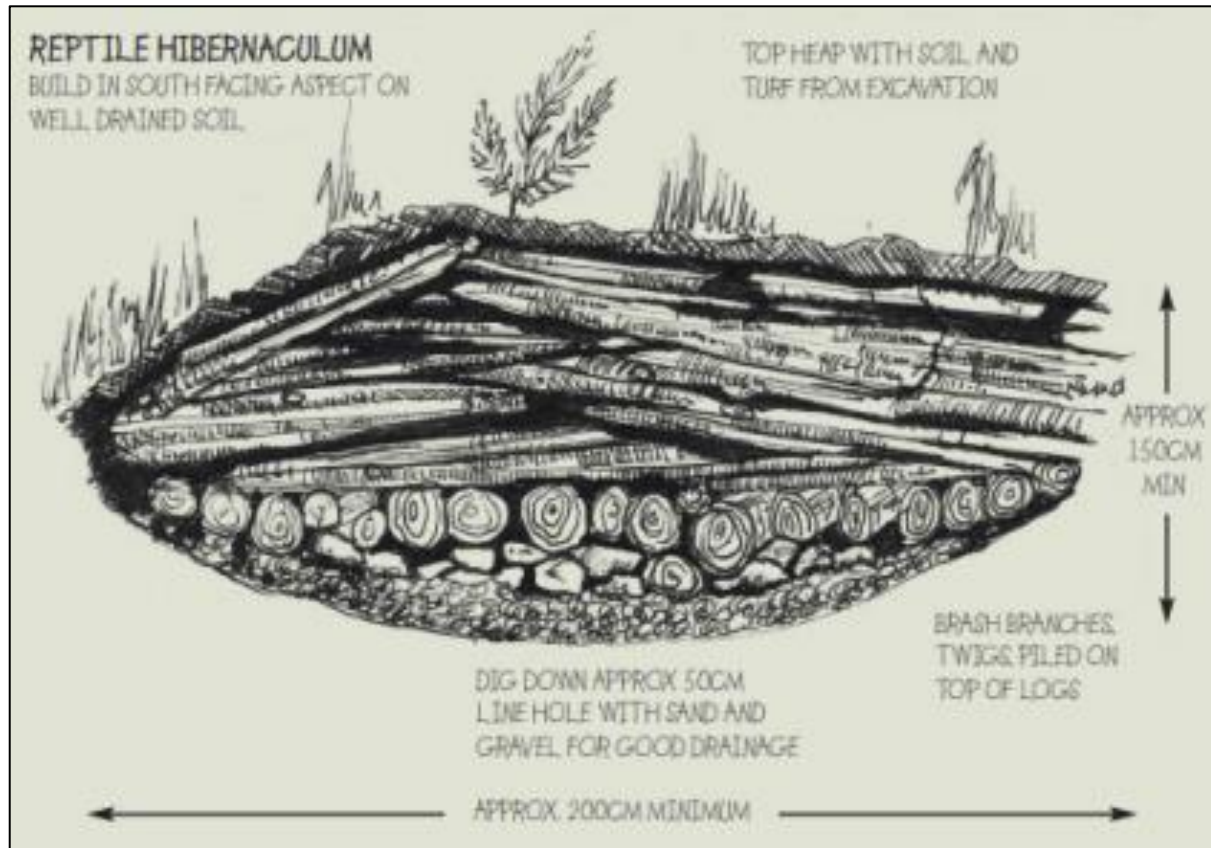


Figure 6. Example structure of an artificial reptile hibernaculum. Taken from ARG UK – Amphibian and Reptile Groups of the United Kingdom advice note II, May 2018.

6 CONCLUSIONS

The land south of Lyne House, Links Road is mostly comprised of amenity grassland, however, scrub and woodland habitat is present on the western side of the site and the southern section is comprised of rough scrub habitat with a wide range of forb species. These two sections of the site have been identified as having potential to support reptiles such as slow worms and grass snakes. Therefore, the removal of these habitats is likely to be at the detriment of these species. For this reason, a reptile presence/absence survey will be necessary. It is also recommended the western boundary is enhanced by the planting of hedgerow and wildflowers and the south-western corner should contain a reptile hibernaculum to mitigate the removal of log piles at the south of the site.

A pond adjacent to the site boundary to the north-west of the site has been rated as 'below average' suitability according to a habitat suitability assessment. However, because of the proximity to the construction footprint and the potential terrestrial habitat being removed or disturbed by the works, eDNA analysis has been carried out on the pond and the results will be provided.



To prevent impacts on breeding birds, any trees and shrubs should be removed outside of the birds breeding season (avoiding 1st March – 31st August). If this is not possible, all trees and shrubs to be removed should be inspected by a qualified, trained ecologist prior to removal.

The enhancement opportunities identified in section 5 of this document will result in new opportunities for nesting birds, foraging bats, reptiles and likely beneficial effects for biodiversity at the site should they all be implemented in full.

It is important that no habitat clearance or other site preparation work should be undertaken until planning permission has been granted and all relevant protections for habitats of importance and protected species have been detailed and implemented. Please be advised that any work to remove or modify habitats outside of typical management may undermine a future planning application.

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



APPENDIX 1 – Wildlife Legislation and National Planning Policy

Introduction

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

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

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

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

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

The ‘Habitats Regulations’

The Conservation of Habitats and Species Regulations 2017, as amended (the “Habitats Regulations”) is the principle means of transposing the Habitats Directive and the Birds Directive, and updates the Conservation (Natural Habitats, &c.) Regulations 1994 (“the 1994 regulations”) in England and Wales.

‘Natura 2000’ sites, now known as National Site Network sites under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, receive the highest level of protection under the Regulations which requires that any activity within the zone of influence of these sites would be subject to a Habitats Regulations Assessment (HRA) by the competent authority (e.g. planning authority), leading to an Appropriate Assessment (AA) in cases where ‘likely significant effects’ to the conservation objectives are identified.

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

- deliberately capture, injure or kill any such animal;
- deliberately disturb wild animals of such species;
- deliberately take or destroy their eggs (where relevant);
- damage or destroy a *breeding or resting place* of such an animal;
- possess, control, sell or exchange any live or dead animal or plant, of such species;



- deliberately pick, collect, cut, uproot or destroy a wild plant of such species.

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

- a licence can be granted for the purposes of "preserving public health or safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment" (Regulation 53 (2) (e);
- a licence can be granted if "there are no satisfactory alternatives" to the proposed action;
- a licence shall not be granted unless the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Wildlife and Countryside Act (1981) as amended.

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

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

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

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

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

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

The Wildlife and Countryside Act 1981 (as amended) also prohibits certain inhumane methods of traps and devices for the capture or killing of wild animals and certain additional methods such as fixed trap,



poisoning with gas or smoke, or spot-lighting with vehicles for killing species listed on Schedule 6 of the Act (this includes all bat species, badger, otter, polecat, dormice, hedgehog and red squirrel).

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

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

Environment Act (2021)

The Environment Act sets a target of halting the decline in species through the inclusion of a legally binding 2030 species abundance target. Aiming to restore natural habitats and enhance biodiversity, the Act requires new developments to improve or create habitats for nature (through mechanisms such as mandatory Biodiversity Net Gain), and tackle deforestation. Going forwards, UK businesses will need to look closely at their supply chains as amongst other measures they will be prohibited from using commodities associated with wide-scale deforestation. Woodland protection measures are also strengthened through the Act.

The Act enables the reform of the Habitats Regulations and further improves protection for nature through the establishment of Local Nature Recovery Strategies that support national Nature Recovery Networks. In addition, the Act provides for the production of Protected Site Strategies and Species Conservation Strategies, aimed at supporting the design and delivery of strategic approaches to deliver better outcomes for nature.

Protection of Badgers Act (1992)

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

Under this legislation, it is a criminal offence to:

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

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



National Planning Policy Framework

The National Planning Policy Framework (NPPF 2021)⁷ sets out the Government's view on how planners should balance nature conservation with development and helps ensure that Government meets its biodiversity commitments with regard to the operation of the planning system.

Paragraph 179b, which states that council policies should “*promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.*” The Office of the Deputy Prime Minister (ODPM) Circular 06/2005, 2005)⁸. In accordance with the NPPF, it is important that developments should contribute to and enhance the natural and local environment by:

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

UK Post-2010 Biodiversity Framework

The UK Biodiversity Action Plan (UK BAP), first published in 1994, was the UK's response to the commitments of the Rio Convention on Biological Diversity (1992) until 2010, when the UK BAP was replaced by the UK Post-2010 Biodiversity Framework. This framework covers the period 2011 to 2020 and forms the UK government's response to the new strategic plan of the United Nations Convention on Biodiversity (CBD) published in 2010. This promotes a focus on individual countries delivering target for protection for biodiversity through their own strategies.

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

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

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

Birds of Conservation Concern (BoCC)

In 1996, the UK's leading non-governmental bird conservation organisations listed the conservation status of all bird species in the UK against a series of criteria relating to their population size, trends and relative importance to global conservation. The lists, known as the 'Red', 'Amber' and 'Green' lists

⁷ HM Government (2021). National Planning Policy Framework. Department for Communities and Local Government. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

⁸ HM Government (2005) ODPM Circular 06/05 Government Circular: *Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7692/147570.pdf.



(in order of decreasing concern) are used to inform key conservation policy and decisions. The lists are reviewed every five years and are a useful reference for determining the current importance of a particular site for birds. The most recent review was undertaken in 2021 (Stanbury et al, 2021), which provides an up to date assessment of the conservation status of birds in the UK.

References

Protection of Badgers Act (1992). HMSO London. Available at:
<http://www.legislation.gov.uk/ukpga/1992/51/contents>

Circular 06/2005 (2005). Government Circular: Biodiversity and geological conservation – statutory obligations and their impact within the planning system. Office of the Deputy Prime Minister, London. Available at:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7692/147570.pdf

Council Directive 79/409/EEC on the Conservation of Wild Birds (“the Birds Directive”). Available at:
<http://jncc.defra.gov.uk/page-1373>

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the “Habitats Directive”). Available at: <http://jncc.defra.gov.uk/page-1374>

The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations”). Available at:
<http://jncc.defra.gov.uk/page-1379>

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Available at:
<https://www.legislation.gov.uk/ukdsi/2019/9780111176573>

Countryside and Rights of Way (CROW) Act (2000). HMSO London. Available at:
<http://www.legislation.gov.uk/ukpga/2000/37/contents>

Defra (2011) Biodiversity 2020: A strategy for England’s wildlife and ecosystem services. Available at:
www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services.

Defra (2013) Progress Update. Available at: www.gov.uk/government/publications/biodiversity-2020-simple-guide-and-progress-update-july-2013.

Stanbury, A., Eaton, M., Aebischer, N., Balmer, N., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021). Birds of Conservation Concern 5: the status of bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man. *British Birds* 114, pp 723-747.

Natural Environment and Rural Communities (NERC) Act (2006). HMSO London. Available at:
http://www.legislation.gov.uk/ukpga/2006/16/pdfs/ukpga_20060016_en.pdf

National Planning Policy Framework (NPPF) (2021) Ministry of Housing Communities & Local Government. Available at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

Wildlife and Countryside Act (WCA) (1981). HMSO London. Available at:
<http://www.legislation.gov.uk/ukpga/1981/69/contents>



APPENDIX 2 – Adur and Worthing Borough Council - Adur and Worthing Borough Council Core Strategy (April 2011)

Policy Number/Title	Policy Summary
Policy 13 -The Natural Environment and Landscape Character	All new development will respect the biodiversity and natural environment that surrounds the development and will contribute to the protection and the enhancement of the area. New development along the coastline, will be designed to incorporate measures to incorporate measures which will limit any adverse impacts on the coast and marine environment. Identified sites in the Worthing Biodiversity Report that have local and nationally recognised designations, such as SNCI and a SSSI will be protected from any development that detracts from their environmental quality and sensitivity.
Policy 17 - Sustainable Construction	The BREEAM standards will be used to assess any new non-residential developments. Where viable and achievable new non-residential development will be expected to go beyond those.



APPENDIX 3 – Great Crested Newt ‘Habitat Suitability Index’ Values

Table 2. HSI calculation for pond assessed during the survey.

	Pond 1	
NGR	TQ 13394 06030	
SI attribute	SI value	Notes
Location	1.00	SE England
Pond area	0.04	20sq/m
Pond drying	1.00	Rarely
Water quality	0.67	Moderate
Shade cover	0.80	70
Water-fowl	1.00	Absent
Fish presence	1.00	Absent
No. ponds	0.10	0
Terrestrial habitat	0.67	Moderate
Macrophytes	1.00	80%
HSI value	0.52	‘Below Average’ suitability



APPENDIX 4 – Reducing Impacts of Artificial Light

Bright external lighting can have a detrimental impact upon foraging and commuting bat flight paths, but more importantly can also cause bats to remain in their roosts for longer. Artificial lighting can also cause significant impacts to other nocturnal species, most notably moths and other nocturnal insects. It can also result in disruption of the circadian rhythms of birds, reducing their fitness.

Guidelines issued by the Bat Conservation Trust⁹ should be referred to when designing the lighting scheme. Note that lighting designs in very sensitive areas should be created with consultation from an ecologist and using up-to-date bat activity data where possible. The guidance contains techniques that can be used on all sites, whether a small domestic project or larger mixed-use, commercial or infrastructure development. This includes the following measures:

Avoid lighting key habitats and features altogether

There is no legal duty requiring any place to be lit. British Standards and other policy documents allow for deviation from their own guidance where there are significant ecological/environmental reasons for doing so. It is acknowledged that in certain situations lighting is critical in maintaining safety, such as some industrial sites with 24-hour operation; however, in the public realm, while lighting can increase the perception of safety and security, measurable benefits can be subjective. Consequently, lighting design should be flexible and be able to fully consider the presence of protected species.

Apply mitigation methods to reduce lighting to agreed limits in other sensitive locations – lighting design considerations

Where bat habitats and features are considered to be of lower importance or sensitivity to illumination, the need to provide lighting may outweigh the needs of bats. Consequently, a balance between a reduced lighting level appropriate to the ecological importance of each feature and species, and the lighting objectives for that area will need to be achieved. The following are techniques which have been successfully used on projects and are often used in combination for best results:

- dark buffers, illuminance limits and zonation;
- sensitive site configuration, whereby the location, orientation and height of newly built structures and hard standing can have a considerable impact on light spill;
- consideration of the design of the light and fittings, whereby the spread of light is minimised ensuring 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. Consideration should be given to the height of lighting columns. It should be noted that a lower mounting height is not always better. A lower mounting height can create more light-spill or require more columns. Column height should be carefully considered to balance task and mitigation measures. Consider no lighting solutions where possible such as white lining, good signage, and LED cat's eyes. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times;
- screening, whereby light spill can be successfully screened through soft landscaping and the installation of walls, fences and bunding;
- glazing treatments, whereby glazing should be restricted or redesigned wherever the ecologist

⁹ Bat Conservation Trust and Institute for Lighting Professionals (2018) Guidance note 8. Bats and Artificial Lighting. <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>



and lighting professional determine there is a likely significant effect upon key bat habitat and features;

- creation of alternative valuable bat habitat on site, whereby additional or alternative bat flightpaths, commuting habitat or foraging habitat could result in appropriate compensation for any such habitat being lost to the development;
- dimming and part-night lighting. Depending on the pattern of bat activity across the key features identified on site it may be appropriate for an element of on-site lighting to be controlled either diurnally, seasonally or according to human activity. A control management system can be used to dim (typically to 25% or less) or turn off groups of lights when not in use.

Demonstrate compliance with illuminance limits and buffers

- *Design and pre-planning phase*; it may be necessary to demonstrate that the proposed lighting will comply with any agreed light-limitation or screening measures set as a result of your ecologist's recommendations and evaluation. This is especially likely to be requested if planning permission is required.
- *Baseline and post-completion light monitoring surveys*; baseline, pre-development lighting surveys may be useful where existing on or off-site lighting is suspected to be acting on key habitats and features and so may prevent the agreed or modelled illuminance limits being achieved.
- *Post-construction/operational phase compliance-checking*; as a condition of planning, post-completion lighting surveys by a suitably qualified person should be undertaken and a report produced for the local planning authority to confirm compliance. Any form of non-compliance must be clearly reported, and remedial measures outlined. Ongoing monitoring may be necessary, especially for systems with automated lighting/dimming or physical screening solutions.

Lighting Fixture Specifications

The Bat Conservation Trust recommends the following specifications for lighting on developments to prevent disturbance:

- Lighting spectra: peak wavelength >550nm
- Colour temperature: <2700K (warm)
- Reduction in light intensity
- Minimal UV emitted
- Upward light ratio of 0% and good optical control

Further reading:

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

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

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

CPRE (2014) Shedding Light: A survey of local authority approaches to lighting in England. Available



at: <http://www.cpre.org.uk/resources/countryside/dark-skies/item/3608-shedding-light>

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

Institution of Lighting Professionals (2021) Guidance Notes for the Reduction of Obtrusive Light GN01:2011. Available at: <https://www.theilp.org.uk/resources/free-resources/>

Voigt, C.C., Azam, C., Dekker, J., Ferguson, J., Fritze, M., Gazaryan, S., Hölker, F., Jones, G., Leader, N., Lewanzik, D. and Limpens, H., 2018. *Guidelines for consideration of bats in lighting projects*. Unep/Eurobats. Available at:

https://cdn.bats.org.uk/uploads/pdf/Resources/EUROBATGuidelines8_lightpollution.pdf?v=1542109376

End.
