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Preliminary Ecological Appraisal, Phase 1 Habitat Assessment

Land at Toddington Lane, Wick, Littlehampton

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Report Summary

1. A combined Phase 1 Habitat Survey and Preliminary Ecological Appraisal was undertaken for land at Toddington Lane, Wick, Littlehampton on the 1st of February 2017. This assessment was undertaken to evaluate the site for the potential of protected species and or valuable habitats at the request of Rabbit Group, who wish to make a planning application to build 10 residential properties 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 supports ruderal habitat, scrub, bare ground and hard standing tarmac, with a large industrial shed located close to the site centre and some open sided metal storage structures.
4. No further surveys are recommended for badgers, bats, great crested newts, dormice or water voles. A reptile presence/absence survey is however recommended owing to the presence of suitable habitat for this group of species. 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. A hand search is also required for hedgehogs prior to site clearance. In addition, if any protected species are found during the proposed work, an ecologist must be contacted immediately for advice.
5. To offset the biodiversity impact of the development, the new hedgerows upon the site should be planted with only native species from UK stock, hedgerow edge planting could be established along the boundaries of the public open space and a wildflower meadow area could be created along the northern embankment. Full details regarding creation and management can be produced within a Mitigation Statement as part of any future planning condition.
6. No statutory designated sites are located within 2km of the sites boundaries.

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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 or likely absence of protected species and or valuable habitats to be present at Land at Toddington Lane, Wick, Littlehampton. The grid reference for the site centre is TQ 03403 03856.

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

This survey assessment was carried out by 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 Rapleys LLP on behalf of the Rabbit Group.

1.2 Background

The Ecology Co-operation was commissioned to assess the current ecological value of Land at Toddington Lane, which is situated to the east of Wick and north of Littlehampton in West Sussex (see figure 1 and 2). Toddington Lane meets the north and western boundaries of the site while an industrial estate meets the western boundary. The boundaries to the south meet three residential properties with gardens and an area of scrub which extends to the south meeting a train line. The assessment was carried out further to a proposal to develop the site into a residential area expected to support 10 new properties and an area of public open space (see figure 3).



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 sites boundaries shown in red.

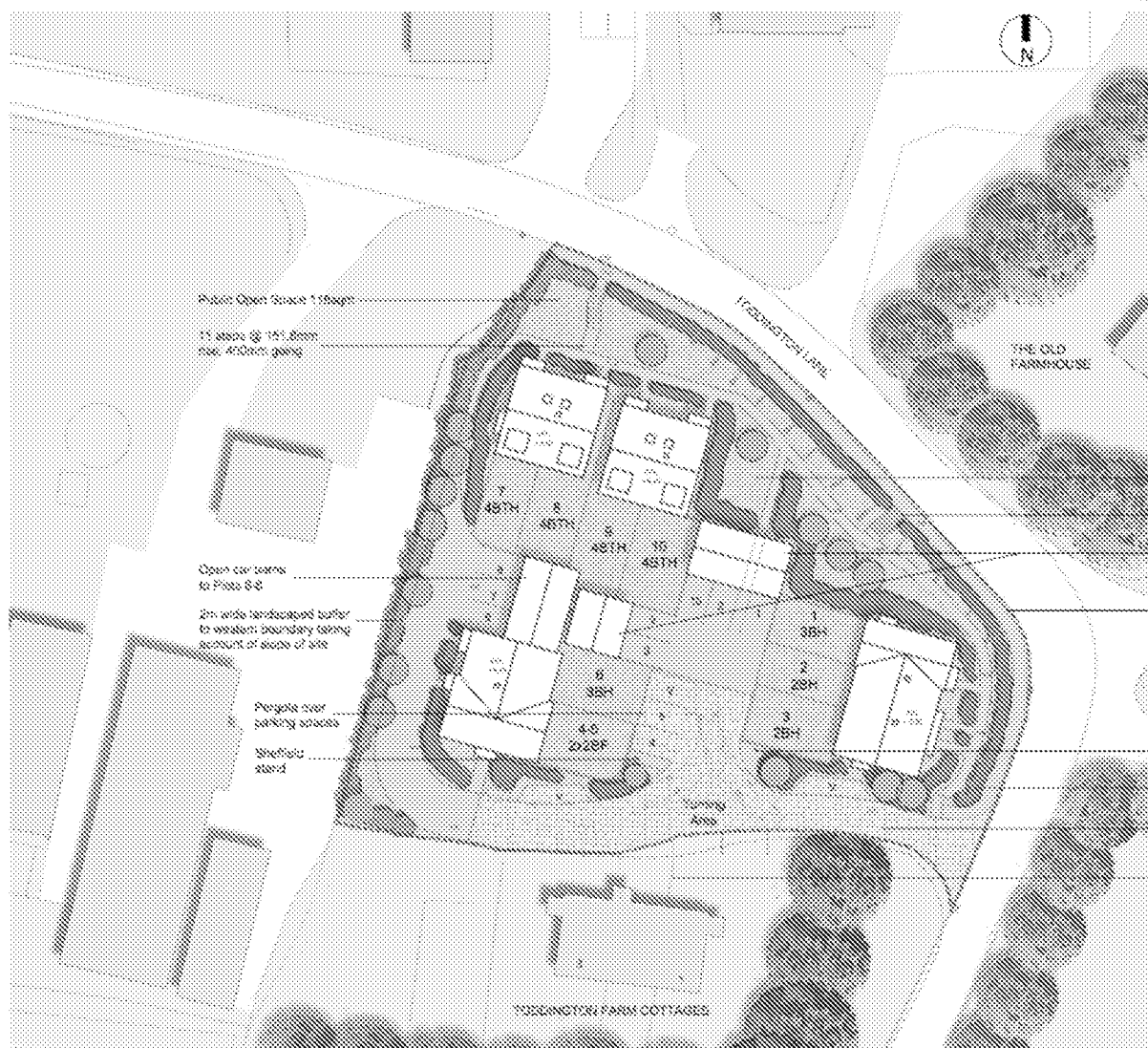


Figure 3. Proposed site plan with the site boundary shown in red.

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 Phase 1 survey is to provide, relatively rapidly, a record of the vegetation and wildlife habitats present over large areas of countryside. The habitat classification is based principally on vegetation, augmented by reference to topographic and substrate features, particularly where vegetation is not the dominant component of the habitat¹.

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



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

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

2.2 Preliminary Ecological Appraisal

A preliminary ecological appraisal was carried out on 1st February 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; and
- Hazel dormouse (*Muscardinus avellanarius*)
- Water Vole (*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 present²³⁴⁵⁶⁷. Details of initial survey method for each species are given below.

Following the appraisal of this site it was decided that a biodiversity record search was required for all protected, BAP and invasive species within a 1km radius of the site. These were obtained on the 07/02/17 from the Sussex Biodiversity Record Centre (SxBRC).

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

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

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

⁵ Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000) Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). *Herpetological Journal* 10, 143-155.

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

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



2.2.1 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 is paid to those features that provide suitable basking areas (e.g. south-facing slopes), hibernation sites (e.g. banks, walls, piles of rotting vegetation) and opportunities for foraging (rough grassland and scrub).

2.2.7 Water Voles

Assessment of habitat suitability of water courses and vegetation bordering them for this species. In addition, water course can be searched 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 ruderal and scrub habitat along with some bare ground and hard standing tarmac. A large industrial shed and some open sided metal storage structures are present.

Table 1. The habitats mapped at Land at Toddington Lane.

Habitat type	JNCC Code	Area(Ha)/ Length (meters)	Target note including general species composition
Ruderal	C3.1	0.24 Ha	A large proportion of the site is composed of ruderal habitat (see figure 6 and 7). The following species were identified; teasel (<i>Dipsacus fullonum</i>), nettle (<i>Urtica dioica</i>), bindweed sp. (<i>Convolvulus sp.</i>), cleavers (<i>Galium aparine</i>), bristly oxtounge (<i>Picris echioides</i>), creeping thistle (<i>Cirsium arvense</i>), ribwort plantain (<i>Plantago lanceolata</i>), creeping buttercup (<i>Ranunculus repens</i>), willow herb sp. (<i>Epilobium sp.</i>), Yorkshire fog (<i>Holcus lanatus</i>), ground ivy (<i>Glechoma hederacea</i>), red clover (<i>Trifolium pratense</i>), oat grass sp., broad leaved dock (<i>Rumex obtusifolius</i>), red dead nettle (<i>Lamium purpureum</i>), vetch sp. (<i>Vicia sp.</i>), bramble (<i>Rubus fruticosus</i>), white dead nettle (<i>Lamium album</i>), herb robert (<i>Geranium robertianum</i>) and a small amount of pendulous sedge (<i>Carex pendula</i>). A three to four metre wide strip adjacent to the road has been cut back. To the north-west corner of the site is a small area of blackthorn (<i>Prunus spinosa</i>) and bramble scrub along with one elder shrub (<i>Sambucus nigra</i>). Scaffolding and other similar materials are stored across a central area of this habitat, whilst a section to the south and beyond the heras fencing to the north and west are clear of stored materials (see figure 8).
Scrub – dense and continuous	A2.1		A area of dense bramble dominated scrub is located upon the bank at the northern boundary of the site (see figure 9).
Bare ground	J4	0.09 Ha	Within the centre of the site is bare ground. This area is used for storage of scaffolding and other similar materials as well as some vehicles (see figure 10).



			The entrance to the site is shared with cottages to the south, located off Toddington Lane and is tarmac surfaced (see figure 11).
Scrub scattered	- A2.2	20 meters	An area of scattered bramble scrub is located just north of the sites entrance.
Fence	J2.4		A wooden panelled fence runs along the western site boundary and part of the eastern boundary, a cypress (<i>Cupressus sp.</i>) hedgerow is located just beyond the fencing to the east. A metal chain link fence is located at the south boundary adjacent to the railway line and ivy, bramble and a herbaceous climber has grown up over this. Heras fencing is located through the site and in areas bramble scrub has grown up this particularly to the south.
Building	J 3.6		An industrial storage shed is situated close to the centre of the site. This structure is described in more detail in section 3.2.2.

An area of scrub is located beyond the southern boundary of the site which extends to meet the train line located to the south (see figure 12). This habitat type is dominated by bramble with the additional following species identified - creeping thistle, broad leaved dock, cleavers, nettle, greater burdock (*Arctium lappa*), willow herb sp. and bindweed sp. (*Convolvulus sp.*). A pile of brash is located in the south-east corner of this area.

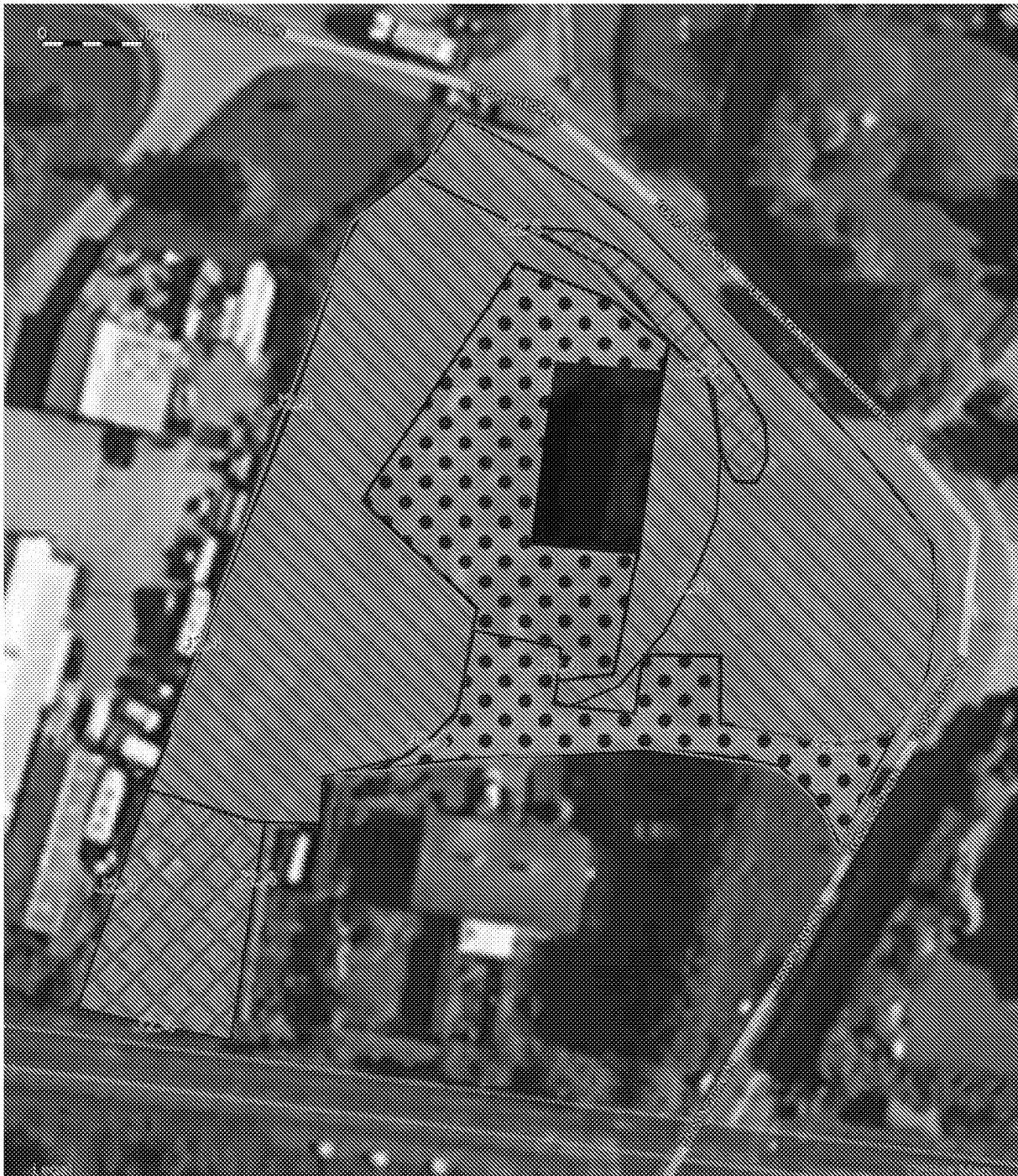


Figure 4. Phase 1 map of the site with the site boundary. The sites boundaries are shown in red.

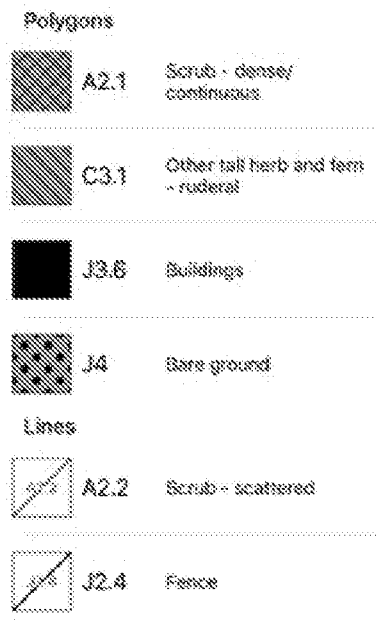


Figure 5. Key for Phase 1 habitat map for Land at Toddington Lane



Figure 6. Ruderal habitat at the site.



Figure 7. Ruderal habitat across the site where materials are being stored.



Figure 8. A view of the ruderal habitat to the east of the site meeting the road.



Figure 9. Dense scrub located to the north of the site. Toddington Lane which boards the northern site boundary is seen in the left of the image.



Figure 10. Bare ground area within the site's centre, where material and vehicles are stored.



Figure 11. Tarmac hard standing entrance at the south-eastern corner of the site.



Figure 12. Dense/ continuous scrub at the southern section of the site.



3.2 Preliminary Ecological Appraisal

3.2.1 Badgers

No signs of any badger activity were seen during the survey assessment. It is likely that if any setts were situated within 30 metres of the site boundary, then some evidence of badger activity would have been observed.

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

3.2.2 Bats

There is an industrial shed used for storage located close to the centre of the site (see figure 13 and 14). The lower walls of the shed are brick with an upper of single skinned corrugated chrysotile, with the roof also constructed of corrugated chrysotile with some clear plastic skylights. Externally the building does not support any potentially suitable crevices to support roosting bats with the corrugated chrysotile material used for the walls and roof sitting flush to each other and are typically unsuitable for roosting bats due to its thermoregulatory properties. Internally the building is brightly light from the plastic roof skylights and a broken window on the eastern face leading to the building being likely unsuitable for void dwelling species such as brown long eared bats (*Plecotus auritus*) (see figure 15). This building is considered under the Bat Conservation Trusts Survey Guidelines as having 'negligible' potential to support roosting bats.

Just to the north of this industrial shed are some open sided metal storage structures which lack any suitable features to support roosting bats (see figure 16).

There are no trees within the boundaries to support potentially suitable bat roosting features.

A large proportion of the site is ruderal and scrub habitat offering moderate foraging value for the more common species of bat such as the pipistrelle species. There are no hedgerows upon the site with the potential to be used by commuting bats.

Records for serotine (*Eptesicus serotinus*), *Myotis* sp., common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and Bat sp. were identified within the SxBRC data set within 1km of the sites boundaries.



Figure 13. Northern face of the industrial shed used for storage with lower brick walls and an upper of single skinned corrugated chrysotile.



Figure 14. Eastern face of the industrial shed with a broken upper window.



Figure 15. Internally the industrial shed is brightly lit by a window on the eastern face and plastic skylights.



Figure 16. Open sided metal storage structures to the north of the industrial shed.



3.2.3 Breeding Birds

All of the scrub habitat across the site has the potential to support a variety of common nesting birds during the nesting bird season, whilst the site is unlikely to support ground nesting birds, which are more vulnerable to regular disturbance.

3.2.4 Dormice

This arboreal species favors mixed broadleaved woodland and hedgerows, where there are clear sources of food for as long of their active season as possible (March to October). The site doesn't support any potentially suitable habitat for dormice and lacks connectivity to any continuous areas of hedgerow and woodland in the wider landscape.

No records for dormice were returned from SxBRC within a 1km radius of the site.

3.2.5 Great Crested Newts

No ponds are located upon the site however three ponds were identified through a search of aerial imagery within 500 meters of its boundaries (see figure 17).

Pond 1 is located approximately 150 meters to the south east of the site within a recently developed area. It appears to be a SUDS pond created as part of a residential development. Unidentified rush species and some bulrush (*Typha latifolia*) are present within the waterbody taking up approximately 80% of the surface area and the pond is unshaded by trees (see figure 18). A road intercepted with a railway line is located between the pond and the site and in combination this is considered a significant barrier to movement for great crested newts.

Pond 2 is situated approximately 105 meters to the east. This pond is located within the garden space of a residential property however it was noted that there was a duck house at the western end of the pond with a major impact of water fowl reducing the ponds suitability to support great crested newts. Two roads are located between this pond and the site, which are considered to be a significant barrier to great crested newt movement.

Pond 3 is located approximately 200 meters to the north upon private land. This pond has a road, a lane and industrial built up areas between it and the site which combined act as a significant barrier to newt migration.

Whilst one record for a smooth newt from 2010 was identified within the SxBRC dataset located approximately 680 meters to the south west, no records for great crested newts were identified within 1km of the site.



Figure 17. Location of three ponds in relation to the site with the sites approximate boundaries shown in red.



Figure 18. Pond 1

3.2.6 Reptiles

The site is suitable for reptiles with ruderal and scrub habitat providing suitable cover from predators and foraging habitat for this group of species. Furthermore, dense scrub habitat extends from the southern site boundary to meet a train line which can be good wildlife corridors for reptiles. In addition, a brash pile, which is considered a suitable reptile hibernacula, is located to the far south of the site (see figure 19).



A large number of slow worm records, from 2011 and 2010 and six records for common lizards dated between 2003 and 2009 were identified within the SxBRC data set within 1km of the site indicating that there are populations of these species within the wider landscape. Additionally, there were two records for grass snakes from 1991.



Figure 19. Pile of brash a suitable reptile hibernacula at the site.

3.2.7 Water Vole

Ten records for water voles were returned within the data search from SxBIC. These are associated with 'Black Ditch' located approximately 545 meters to the north. There are no suitable habitats within the sites boundaries for this species; the closest potentially suitable habitat identified on background mapping is a wet ditch located approximately 235 meters north of the site.

3.2.8 BAP Species

A number of records for hedgehogs were returned from SxBRC with 10 from 2015. The locations of these records are not specified however they were noted as being located within Littlehampton CP. Some of the habitat within the sites boundaries, the scrub and pile of brash, is suitable habitat for hedgehogs, to shelter.

3.2.9 Designated Sites and Wider Ecological Impact Significance

A search was undertaken on the MAgiC website resource (www.magic.gov.uk) and no statutory designated sites were identified within 2km of the site.



3.3 Constraints/Limitations

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

4 DISCUSSION AND RECOMMENDATIONS

4.1 Preliminary Ecological Appraisal

The overall ecological value of the majority of the site is low to moderate, with the bramble dominated scrub having low species diversity whilst the ruderal habitat had increased botanical diversity. However the value of the site is reduced due to a large area being used for storage of scaffolding, building materials and vehicles. The remainder of the site is bare ground and hard standing supporting a single industrial shed and open sided metal storage structures.

4.1.1 Badgers

No signs of badger activity were identified during the assessment and no badger setts are situated within the sites boundaries. No further surveys are recommended however, if any signs of digging by large animals is identified within or near to the sites boundaries prior to site clearance and construction an ecologist should be contacted for advice.

4.1.2 Bats

The industrial building is concluded under the Bat Conservation Trusts Survey Guidelines as having 'negligible' potential to support roosting bats, because of it lacking any suitable external features for crevice dwelling species and being unsuitable for void dwelling species internally, due to it being well lit and lacking a sealed roof void. Therefore, no further surveys are recommended.

The open sided metal storage structures to the north of the industrial shed do not support any potentially suitable bat roosting features, and there are no trees on the site to support potentially suitable bat roosting features.

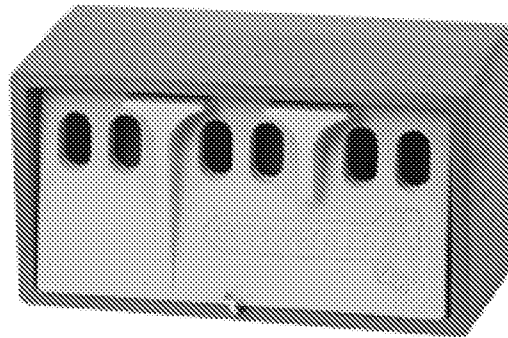
As the site may have some foraging value for common bat species, with records for some common bat species identified with SxBIC data set, it is very important that the impacts of artificial lights are minimised where possible. In Appendix 2, guidelines produced by the Bat Conservation Trust are included and it is important that the development adheres to these guidelines.

4.1.3 Breeding Birds

All of the scrub and occasional shrubs 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 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 as clear from active birds nests. Active nests must be left alone till the young have fledged.



Post development the site can be enhanced for birds with two 1B Schwegler Nest Boxes. These nest boxes should be placed upon trees, fences or buildings at a height of at least 3 meters. Additionally, a 1SP Schwegler Sparrow Terrace could be installed upon the wall of a new property at a height of more than 2 meters to provide nesting habitat for this declining species.



1B Schwegler Nest Box 1SP Schwegler Sparrow Terrace

4.1.4 Dormice

The site doesn't support potentially suitable habitat for dormice, and lacks connectivity to any continuous areas of hedgerow and woodland in the wider landscape due to its urban location. Additionally, no records for this species were returned within the SxBIC data set. Resultantly no further surveys are recommended for this species as it is considered highly unlikely that dormice would be found upon the site.

4.1.5 Great Crested Newts

No ponds were identified on the site however, three ponds were identified within 500 meters of the sites boundaries.

Pond 1, a SUDS pond located approximately 150 meters to the south east, has been scoped out due to a road intercepted with a railway line being located between it and the site acting as a significant barrier to movement for great crested newts. Pond 2, situated approximately 105 meters to the east has also been scoped out as two roads are located between this pond and the site which would act as a barrier to great crested newt movement. Finally, Pond 3, located approximately 200 meters to the north has been ruled out from further surveys as there is a road, a lane and industrial built up areas between it and the site, which combined act as a significant barrier to newt migration.

Furthermore whilst one record for a smooth newt from 2010 was identified within the SxBIC dataset no records for great crested newts were identified with 1km of the site.

As a result it is considered unlikely that great crested newts would be found within the sites boundaries and no further surveys or mitigation is recommended.

4.1.6 Reptiles

The site is suitable for reptiles, with the ruderal and scrub suitable habitat to support populations of reptiles with suitable reptile hibernacula also present. Numerous records for slow worm and common



lizards were identified by SxBIC within 1km of the site as well as two records for grass snakes, indicating that there are populations of these species within the wider landscape. Furthermore, scrub extends from the southern boundary of the site to meet a train line to the south which can be good wildlife corridors for reptiles.

It is important that the use of the site by reptiles (if any) is understood so that if necessary, an appropriate mitigation strategy can be produced. Mitigation strategies are designed according to both the species, population and distribution of reptiles across the site and a reptile presence/absence survey is recommended to gather this information.

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

4.1.7 Water Vole

Ten records for water voles were returned within the data search from SxBIC. The results were associated with Black Ditch located approximately 545 meters to the north. However, no suitable habitats are present within the sites boundaries for this species and resultantly no further surveys are recommended.

4.1.8 BAP Species

A number of records for hedgehogs were returned from SxBIC with 10 records from 2015. Some of the habitat within the sites boundaries, the scrub and pile of brash, is suitable habitat for hedgehogs. Resultantly a hand search of these features by a suitably qualified ecologist is recommended prior to site clearance so that in the event any hedgehogs are found they can be removed safely.

4.2 Development Impact Assessment

This development would see the loss of some bramble dominated scrub and ruderal habitat with low to moderate ecological value, as well as an industrial shed with 'negligible' potential for bats and some bare ground.

It is recommended that all of the new hedgerows upon the site are created with only native species from UK stock. It is recommended that 50% is composed of blackthorn and the remaining 50% made up of five of the following species; hawthorn (*Crataegus monogyna*), spindle (*Euonymus europaeus*), dogwood (*Cornus sanguinea*), Wayfaring-tree (*Viburnum lantana*), field or dog rose (*Rosa arvensis*/*Rosa canina*), guelder rose (*Viburnum opulus*), field maple (*Acer campestre*), wild privet (*Ligustrum vulgare*), beech (*Fagus sylvatica*) and hazel (*Corylus avellana*). Furthermore, the landscaping plan should incorporate a variety of trees native to the UK sourced from UK stock (non-native trees and shrubs may still be used for landscaping the residential plots). Given the arrival of ash dieback, it is not recommended that any ash saplings are planted anywhere on the site. This will enhance the site and help to 'off-set' the impacts of new development at this site in line with NPPF recommendations.



A wildflower meadow area could be created along the northern embankment as part of site enhancement. It is recommended that a mixture such as EM2 – Standard General Purpose Meadow Mixture which can be purchased from wildseed.co.uk is used. Specific details regarding area, creation and management can be produced within a Mitigation Statement as part of any future planning condition.

This development will not impact any statutory designated sites as none are located within 2km of the sites boundaries.

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.

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.

6 APPENDIX 2 - ARTIFICIAL LIGHTING AND WILDLIFE

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



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

Overview of impacts

Invertebrates

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

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

Birds

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

Mammals

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

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

As above

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

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

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

The detrimental effect of artificial lighting is most clearly seen in bats. Our resident bat species have all suffered dramatic reductions in their numbers in the past century. Light falling on a bat roost exit point, regardless of species, will at least delay bats from emerging, which shortens the amount of time available



to them for foraging. As the main peak of nocturnal insect abundance occurs at and soon after dusk, a delay in emergence means this vital time for feeding is missed. At worst, the bats may feel compelled to abandon the roost. Bats are faithful to their roosts over many years and disturbance of this sort can have a significant effect on the future of the colony. It is likely to be deemed a breach of the national and European legislation that protects British bats and their roosts.

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

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

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

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

Recommendations

Survey and Planning

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

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

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

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

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

This can help planners reach the right design through the setting of appropriate conditions



relating to performance and mitigation measures at the planning stage.

The Institution of Lighting Professionals (ILP) recommends that Local Planning Authorities specify internationally recognised environmental zones for exterior lighting control within their Development Plans⁸. In instances lacking classification, it may be necessary to request a Baseline Lighting Assessment/Survey conducted by a Lighting Professional in order to inform the classification of areas, particularly for large-scale schemes and major infrastructure projects.

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

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

Principles and design considerations

Do not

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

Avoid

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

Do

- **consider employing a competent lighting designer** who will apply the principals of providing the right light, in the right place, at the right time and controlled by the right system.
- **minimise the spread of light** to at, or near horizontal and ensure that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required.
- **consider the height of lighting columns**. It should be noted that a lower mounting height is not always better. A lower mounting height can create more light spill or require more columns. Column height
- **consider no lighting solutions where possible** such as white lining, good signage and LED cats eyes. These options can also be effective. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times.
- **use temporary close-boarded fencing until vegetation matures**, to shield sensitive areas



from lighting.

- **limit the times that lights are on to provide some dark periods.** The task being lit often varies, for example roads are less used after 23.00hrs and car parks are empty. A lighting designer can vary the lighting levels as the use of the area changes reducing lighting levels or perhaps even switching installations off after certain times. This use of adaptive lighting can tailor the installation to suit human health and safety as well as wildlife needs.

Technological specifications

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

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

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

Further reading:

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

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

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

