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Preliminary Ecological Appraisal Report

Battlers Green Farm, Common Lane, Radlett, Hertfordshire WD7 8PH

April 2021

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QUALITY CONTROL

The information which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct.

Prepared by	Assistant Ecologist - Lewis Hooper	March 2021
Checked by	Senior Ecologist - Karen Bartlett	April 2021

This report remains valid for 12 months from date of issue.

Survey data is valid for 12-24 months from the date the survey was undertaken.

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Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living creatures are capable of migration and whilst protected species may not have been located during the survey duration, their presence may be found on site at a later date.

The views and opinions contained within the document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to works.

1. EXECUTIVE SUMMARY

- 1.1. This report documents the results of a Preliminary Ecological Appraisal (PEA) at Battlers Green Farm, Common Lane, Radlett, Herts WD7 8PH.
- 1.2. The proposed development site contains areas of arable, semi-improved grassland, hedgerow, hardstanding and bare ground as well as a manure pit and silo. The proposals (drawing no.1 100, Rev A) are to build a doggy day care centre containing a reception building, storage facilities and a staff car park within the eastern most section of the site along with multiple fields making up the majority of the site which are to be fenced.
- 1.3. The areas of habitats to be affected by the proposals, including arable, semi-improved grassland, hardstanding and bare ground as well as a manure pit and silo, have been assessed as being of low ecological value. No further survey work is considered necessary.
- 1.4. Outline mitigation and enhancement recommendations have been made in order to ensure that opportunities are available for protected species following the completion of the development, and that the ecological value of the site is enhanced in the long-term.

2. INTRODUCTION & BACKGROUND

- 2.1. This report documents the results of a Preliminary Ecological Appraisal (PEA) undertaken at Battlers Green Farm, Common Lane, Radlett, Herts WD7 8PH.
- 2.2. The survey and report undertaken followed the standard JNCC Phase 1 Survey Methodology, extended to assess the potential for the site to support protected species.

Site Overview

- 2.3. The proposed development site contains areas of arable, semi-improved grassland, hedgerow, hardstanding and bare ground. The site is within a semi rural area, and is immediately surrounded by further arable fields and a farm and retail complex to the east. (Map 1, below).
- 2.4. The wider landscape comprises areas of agricultural land, tree lines and hedgerows, grassland and areas of residential housing with the town of Radlett to the northeast (Map 2, below).
- 2.5. The proposals (drawing no.1 100, Rev A) are to build a doggy day care centre containing a reception building, storage facilities and a staff car park within the eastern most section of the site along with multiple fields making up the majority of the site which are to be fenced.



Map 1: An aerial view of the rough outline of the plot of land at Battlers Green Farm (*Copyright Google Maps 2019*)



Map 2: An aerial view of the site within the wider landscape (*Copyright Google Maps 2019*)

3. LEGISLATION & POLICY

National Planning Policy Framework (NPPF) 2019

3.1. The NPPF aims to minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity. Chapter 15 'Conserving and enhancing the natural environment' details what local planning policies should seek to consider with regard to planning applications:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

170 a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

170 d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

174 b) 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.

175 a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

175 d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity."

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

3.2. The UK Biodiversity Plan (BAP) was a programme designed to help conserve the UK's biodiversity. It led to the production of 436 action plans between 1995 and 1999 to help many of the UK's most threatened species and habitats to recover. A review of the UK BAP

priority list in 2007 led to the identification of 1,150 species and 65 habitats that met the BAP criteria at UK level. Currently 56 Habitats of Principal Importance and 943 Species of Principal Importance are listed on Schedule 41 of the Natural Environment and Rural Communities (NERC) Act 2006 and these include species and habitats which were identified in the UK BAP and which continue to be considered to represent the conservation priorities of England in the UK Post-2010 Biodiversity Framework. Species of Principal Importance include West European hedgehog *Erinaceus europaeus*, great crested newt (GCN) *Triturus cristatus*, dormouse *Muscardinus avellanarius*, and common toad *Bufo bufo*.

Hertfordshire Biodiversity Action Plan (LBAP)

- 3.3. In 1998, a 50 year vision for wildlife and natural habitats of Hertfordshire was prepared, and this was reviewed and completed in 2005/06. This identifies the UK priority habitats and species within Hertfordshire, as well as Key Biodiversity Areas where ecological features can be enhanced through restoration, creation and reduction in fragmentation on a landscape scale.
- 3.4. Full protected species legislation is detailed in the appendix.

4. METHODOLOGY

Desk Study

- 4.1. A web-based desk study was undertaken for designated sites and protected species and habitat records within 2km of the site. The following online resources were consulted:
 - The MAGIC website, to obtain information on any designated sites of nature conservation interest within 2km of the site and details of any European Protected Species licences issued within 2km (http://www.magic.gov.uk/ MagicMap.aspx); and
 - Google Maps, to view aerial photographs, maps and to assess the ecological context of the site
- 4.2. Data searches were requested from (HERC) Hertfordshire Environmental Records Centre for all protected species records and designated sites within 2km of the site.

Site Visit

4.3. Assistant Ecologist Lewis Hooper BSc (Hons) & QualCIEEM undertook a PEA on 23rd March 2021.

Preliminary Ecological Appraisal

- 4.4. The PEA identified the habitats present and their potential for protected species, particularly bats, birds, hedgehogs, badgers *Meles meles*, dormice, amphibians and reptiles, following the standard guidelines set out by the Chartered Institute of Ecology and Environmental Management (CIEEM).
- 4.5. The trees and other habitats immediately adjacent to the area to be affected within the red line boundary were assessed for their potential to support roosting and foraging bats, birds and other protected species.

Mammals

- 4.6. Small crevices and internal features found in trees within and adjacent to the site were assessed for their likely use for roosting bats. Open areas were also assessed for their potential use by foraging and commuting bats.
- 4.7. Areas of dense vegetated cover on site and adjacent to the site were assessed for their likely use by badgers, and attention was paid to the presence of any signs of current or historic badger activity such as setts and latrines.

- 4.8. Open areas of habitat were visually assessed for signs of mammal tracks, push throughs and latrines.
- 4.9. Areas of tree lines, hedgerows and other boundary vegetation were assessed for their likely use by hazel dormice, or increased likelihood of use due to presence of hazel *Corylus avellana* and other suitable food species.

Amphibians

- 4.10. An HSI assessment was carried out on one pond found 20m north of the site. The HSI score gives an indication of the likelihood of the presence of GCN within a water body.
- 4.11. Generally, ponds with a higher score are more likely to support GCN than those with a lower score and there is a positive correlation between HSI scores and ponds in which GCN are recorded. Ten separate attributes are assessed for each pond to calculate the suitability of the ponds to support this species:
 - 1. Geographic location
 - 2. Pond area
 - 3. Desiccation rate
 - 4. Water quality
 - 5. Shade
 - 6. Number of fowl
 - 7. Number of fish
 - 8. Number of linked ponds
 - 9. Terrestrial habitat
 - 10. Macrophyte cover
- 4.12. A total score of between 0 and 1 is calculated and pond suitability is then determined according to the scale shown in Table 1 below:

Table 1: Suitability of ponds for breeding great crested newts in relation to HSI score				
HSI Score	Pond Suitability			
< 0.5	Poor			
0.5 - 0.59	Below average			
0.6 - 0.69	Average			
0.7 - 0.79	Good			
> 0.8	Excellent			

4.13. Habitats within the red line boundary of the site were assessed for their likely use by amphibians in their terrestrial phase, for both foraging and refuge purposes .

Reptiles

4.14. Open areas of habitat were visually assessed for suitability for reptiles and features which increase the likelihood of use of the site by reptiles, including the presence of tussocky vegetation, log and rock piles, basking spots and compost heaps.

Birds

4.15. Tree lines, hedgerows, grassland and buildings were assessed for their likely use by breeding and foraging birds.

Survey Constraints

- 4.16. The survey was conducted in early spring outside of the optimal survey season but the habitats and species found were common and widespread and the seasonality of the survey won't affect the results found.
- 4.17. It should be noted that only dominant botanical species were identified to classify habitat type. Indicator species were noted where present. The habitat descriptions provided do not encompass full floral species lists and only dominant native species within each habitat type were recorded at the time of survey. Due to the the paucity of the habitats present, and the site's amenity setting it is unlikely that there will be any significant changes to the findings if the surveys were undertaken at a more optimal time.

5. SURVEY RESULTS, IMPACTS AND PROPOSED MITIGATION

<u>Desk Study</u>

Designated Sites

- 5.1. There are no sites nationally or internationally designated for their nature conservation value within 2km of the site.
- 5.2. The site sits within the impact risk zones (IRZ) of Bricket Wood Common Site of Special Scientific Interest (SSSI) located 3km north west and Redwell Wood SSSI located 7km to the north east. The Local Planning Authority should consult with Natural England before giving consent for any planning applications for residential development of 100 units or more within these IRZs.

Local Wildlife Sites

5.3. There are 17 Local Wildlife Sites present within 2km of the site but only a single site is present within 1km of the site (see Figure 2). The single site within 1km is Copse by Watford Road, located 900m north of the site and is a small semi-natural woodland surrounding an old pit supporting a canopy of pedunculate oak *Quercus robur* and ash *Fraxinus excelsior* with occasional blackthorn *Prunus spinosa* and hornbeam *Carpinus betulus* coppice. The ground flora contains abundant bluebell *Hyacinthoides non-scripta* and dog's mercury *Mercurialis perennis*.

Priority Habitats and Ancient Woodland

- 5.4. There are few areas of protected habitat within the 2km buffer, mostly made up of priority deciduous woodland as well as wood-pasture and parkland.
- 5.5. No ancient woodland inventory sites are present within 2km of the site.

Biological Records

- 5.6. A number of protected and notable species were found to be present within 2km of the site. Figure 3 shows the approximate locations of protected and notable species recorded within 1km of the site and bat species recorded within 2km of the site from records within the last 20 years.
- 5.7. A number of protected species were provided with only two or four figure grid references and so could not be mapped. Birds listed as Species of Principal Importance under the NERC Act and Bird species on the Birds of Conservation Concern (BoCC4) red list are shown on Figure 2. No protected plant or lichen species were found to be present on site or within 100m of the site.

Anticipated Impacts and Mitigation

- 5.8. The site sits within the risk impact zones of Bricket Wood Common SSSI and Redwell Wood SSSI, however due to the fact that no residential units are being proposed there are no anticipated impacts on these sites, and Natural England will not require consultation.
- 5.9. Due to the intervening distance between the proposed development and designated sites detailed above, no direct impacts are expected as a result of the proposals. The proposals are not residential so no increased activity at the local wildlife sites are anticipated due to this development.

Preliminary Ecological Appraisal

- 5.10. During the PEA, areas of arable, semi-improved grassland, hedgerow, hardstanding and bare ground were identified within the site boundary.
- 5.11. Figure 1 shows the location and extent of the habitats recorded. It should be noted that only dominant botanical species were identified to classify habitat type. Indicator species were noted where present. The habitat descriptions provided below do not encompass full floral species lists and only dominant native species within each habitat type were recorded at the time of survey.

Arable

5.12. The majority of the land was part of a larger arable field planted with a cereal crop. This field appeared to still be in use (see image 1). The margins around the arable fields were roughly 2m wide and consisted of semi-improved grassland on the northern and eastern boundaries and partially on the western boundary. Species present included perennial ryegrass *Lolium perenne*, false oatgrass *Arrhenatherum elatius*, cock's foot *Dactylis glomerata*, broadleaved dock *Rumex obtusifolius*, common dandelion *Taraxacum officinale*, clover *Trifolium sp*, red dead nettle *Lamium purpureum*, white dead nettle *Lamium album*, groundsel *Senecio vulgaris*, wild carrot *Daucus carota*, and common daisy *Bellis perennis*. (see image 2)

Semi-improved grassland

5.13. A small sections of semi improved grassland was present around the base of the silo. This grassland appeared to be un-managed and contains similar species to the field margins.

Hedgerow

5.14. A single hedgerow ran along the northern boundary. The hedgerow measured roughly 1m in width, 1m in height and 140m in length. The hedgerow looked to be planted in the last three years and was cut back. The hedgerow was made up of hawthorn *Crataegus monogyna*. (see image 3)

Bareground

5.15. Areas of bare ground were present forming tracks used by farm vehicles. These areas were made up of mud with few plants coming through. Some areas of this habitat contain rubble piles and piles of tyres (see image 4).

Hardstanding

5.16. An area of concrete hardstanding was present in the northeastern corner of the site. This area held a large manure pit (see image 5).

Other Notable Habitats

- 5.17. A large silo and manure pit was present in the northeastern section of the site (see images 4 and 5).
- 5.18. A mature tree line consisting of ash, pedunculate oak, field maple *Acer campestre*, hazel *Corylus avellana* and beech *Fagus sylvatica* was present with 2m of the western site boundary.

Habitat Summary and Impacts

- 5.19. It is understood that the hard standing, silo and manure pit, semi-improved grassland and arable land are to be affected and the site is to be fenced.
- 5.20. The plants recorded within the habitats on-site likely to be affected by development are common and widespread in the UK and the habitats anticipated to be affected are considered to be of negligible ecological value.



Image 1: The large area of arable land within the site



Image 2: A view of the semi-improved grassland margins



Image 3: The hedgerow extending up the northern boundary of the site



Image 4: The bare ground within the site and the silo



Image 5: The concrete hardstanding and the manure pit



Tree line

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Hardstanding and

manure pit

Hedgerow

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Protected species

Amphibians

Desk Study

5.21. No records of amphibians were returned within 1km of the site within the last 20 years.

Habitat Assessment

- 5.22. The pond within 20m of the site was assessed for its suitability to support breeding GCN using the habitat suitability index assessment (HSI). Its HSI score was 0.51 which suggests a below average suitability for breeding GCN. The low score was mainly attributed to the shaded nature of the pond, its poor water quality and small size.
- 5.23. No other waterbodies were present within 250m of the site. The terrestrial habitat within the site including the arable and small amount of semi-improved grassland within the site are deemed to offer poor suitability for amphibians in their terrestrial stage due to its regular management.

Impact of Proposals and Recommendations

- 5.24. It is considered that the terrestrial habitats present within the site and the breeding habitats within the wider surroundings are of limited suitability for GCN, and their presence is highly unlikely. Therefore, further survey work is considered unnecessary.
- 5.25. In the extremely unlikely event that GCN are found on site during works all works must **stop** immediately and a suitably qualified ecologist contacted for advice.

Badgers

Desk Study

5.26. A number of records of Eurasian badgers were returned within 1km of the site within the last 20 years.

Habitat Assessment

- 5.27. The habitats, namely semi improved grassland borders and arable farmland, within the site provide foraging opportunities for badgers. In addition the fields adjacent to the site and the woodlands within close proximity provide opportunities for sett creation and further foraging habitat.
- 5.28. No evidence of badgers was found on site during the PEA.

Impact of Proposals and Recommendations

- 5.29. The area due to be lost contains a small amount of valuable foraging habitat for badgers within the wider context, although no evidence of this species was identified on site. Given the proposed working area is highly unlikely to provide opportunities for sett creation, no further survey work relating to this species is considered necessary.
- 5.30. As a precaution, any trenches and holes created within the site should be covered or contain a mammal ladder overnight to avoid trapping badgers that may have fallen in.

Bats

Desk Study

5.31. A number of bat records were returned within 2km of the site consisting of nine species within the last 20 years.

Habitat Assessment

- 5.32. Habitats within the site boundary, including the hedgerows and open field provide potential foraging and commuting opportunities for bats. The arable nature of the land may result in fewer insects being present lowering its suitability for bats.
- 5.33. Trees adjacent to the site are mature enough to support roosting bats.

Impact of Proposals and Recommendations

- 5.34. Due to no roosting habitat being present within the site boundary, further survey work is not considered necessary.
- 5.35. As the habitats around the site, namely the treelike adjacent to the western boundary, have been identified as suitable to support bats, any new external lighting should be directed to avoid light spillage onto vegetation. Bats are sensitive to light and could potentially avoid the area if access points or the surrounding areas become illuminated. Appropriate lighting options will prevent a negative impact on bats potentially using the habitats on site and should be approved by a suitably qualified licensed bat ecologist.
- 5.36. Impacts on bats can be reduced through the use of "warmer" lights as these are less penetrating than bright or cool white lights. Brightness and duration of light should be maintained at as low a level as possible. Motion sensors are strongly recommended, and it is important to direct the light only where it is needed to avoid light spillage onto vegetated margins, this can be achieved achieved by using fixtures that shield the bulb and direct the

light downward.Incidental upward lighting can be minimised by fitting lights with downward facing baffles Further details regarding lighting and wildlife are provided in the appendix.

5.37. General recommendations and enhancements in regard to bats are outlined below.

Birds

Desk Study

5.38. A number of protected or notable bird species were returned within 1km of the site within the last 20 years.

Habitat Assessment

- 5.39. During the site walk over a number of bird species were recorded including low numbers of meadow pipit *Anthus pratensis*, linnet *Linaria cannabina* and skylark *Alauda arvensis*.
- 5.40. The hedgerow and arable land provide nesting opportunities for birds within the site. On this basis, recommendations with respect to this species group are set out below to ensure that they are safeguarded throughout the development works.

Impacts of Proposals and Recommendations

- 5.41. All occupied birds nests have legal protection from damage and destruction under the Wildlife & Countryside Act (1981). All clearance of buildings and any suitable vegetation should therefore be undertaken outside of the nesting bird season (March to September inclusive for most species in the UK). If vegetation clearance or demolition of the buildings during the nesting season cannot be avoided, a nesting bird check, undertaken by a suitably qualified ecologist, should take place immediately prior to clearance. If any active bird nests are found in the areas that need to be cleared they must be buffered from disturbance and works will not be allowed to commence until the chicks have fledged.
- 5.42. The arable field is suitable for ground nesting birds such as Skylarks which were found on the site. Due to the limited size of land taken by the works in comparison to the wider surroundings it is considered unlikely to affect the overall local population as there is further suitable habitat in the wider surroundings.
- 5.43. Further enhancements in regards to this group are provided below.

Dormice

Desk Study

5.44. No records of dormice from the last 20 years was returned within 1km of the site.

Habitat Assessment

5.45. The habitats on site provide very limited suitability for this species as the hedgerow was immature and only consisted of a single species. Although the hedgerow provides some connectivity to the wider surroundings, the woodland and scrub in close proximity to the site is isolated and it is considered unlikely that the species is present.

Impact of Proposals

5.46. It is considered to be extremely unlikely that the proposed works will directly affect dormice and no further survey work is considered necessary.

Hedgehog

Desk Study

5.47. A single record of hedgehog was returned within 1km of the site within the last decade.

Habitat Assessment

5.48. The hedgerows, arable land and semi improved grassland as well as habitats in the surrounding area are considered to be suitable for hedgehogs and it is considered possible that they may pass through the site on occasion.

Impact of Proposals

5.49. It is considered possible that this species may be present within the site during clearance works. While it is considered unlikely that the proposed works will directly affect hedgehogs, it will impact suitable habitats. Safeguarding recommendations with respect to this species are set out below.

Mitigation and Compensation

- 5.50. All dense brash piles, log piles and rubble piles should be cleared by hand in a sensitive manner to ensure the welfare of any hedgehogs that may be utilising these habitats.
- 5.51. Any trenches and holes created within the site should be covered or contain a mammal ladder overnight to avoid trapping hedgehogs or other fauna that may have fallen in.
- 5.52. If any new fence-lines are proposed, these should include wildlife access holes so that they can freely access / exit the site. 13cm by 13cm is sufficient for any hedgehog to pass through and will be too small for most pets.

Reptiles

Desk Study

5.53. A single record of grass snake was the only recorded reptile found within 2km of the site. This record is located 1.5km north east of the site and dates from 2012.

Habitat assessment

5.54. The dominant habitat within the site is arable land which is not suitable for reptiles as it lacks the structurally diverse edge habitats preferred by the species. The areas of semi improved grassland are small and limited in opportunities to support a population of reptiles. The habitat within the wider surroundings including further arable fields, and hedgerows provide few opportunities for reptiles.

Impact of Proposals and Recommendations

5.55. Given the small scale of suitable habitat within the site due to be affected, it is considered unlikely that reptiles will be present and no further survey work is required.

6. ENHANCEMENT RECOMMENDATIONS

- 6.1. The habitats present on site which are due to be affected include areas of arable, semiimproved grassland, hardstanding and a silo and manure pit. These habitats were judged to be of low ecological value and impacts to the surrounding land will be negligible.
- 6.2. National planning policy states that all developments should seek to enhance onsite biodiversity whether impacts on protected species are recorded or not. Please see below for specific recommendations.

Landscaping

Wildlife Beneficial Landscaping Scheme

- 6.3. Due to the sites connectivity to habitats in the wider landscape including the open fields to the north any future landscaping planting should seek to complement the surrounding habitats and provide food and shelter for a wide range of faunal species.
- 6.4. Care should be taken to manage habitats in a suitable way to encourage a wide variety of insects and other wildlife to use the site. This is best achieved with reduced management, and can include leaving some grassland areas to be cut only once or twice a year to encourage flowers. All amenity planting and formal landscaped areas should be created from a palate of wildlife beneficial plants (ideally, but not necessarily native) chosen for their nectar or fruit.
- 6.5. No invasive species should be planted. If any invasive species are found on-site these should be removed with care during vegetation clearance and disposed of appropriately and where possible should be replaced with native flowering plants.

Bat and Bird Boxes

- 6.6. In order to help achieve a biodiversity net gain on site it is recommended that a number of roost/nest boxes are incorporated into the site area and within any building structures if feasible, in order to improve the availability of roosting and nesting opportunities for these species groups.
- 6.7. It is recommended that one 2F Schwegler Bat Box with Double Front Panel and one 3FN Schwegler Bat Box are hung on trees adjacent to the western boundary to provide additional roosting habitat for bats using the area. Examples of these can be found in the appendices.

6.8. It is recommended that one bird boxes such as Schwegler 1B Nest Boxes, or similar (with a 32mm entrance hole) are installed within the trees adjacent to the western boundary. This will provide opportunities for birds such as house sparrow *Passer domesticus*, blue tit *Cyanistes caeruleus*, and great tit *Parus major*. In addition to this a sparrow terrace should be installed on the new building to provide nesting habitats for house sparrows using the site. Further details can be found in the appendices.

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*NOTE Areas are indicative and are not shown to exact scale.

Site Boundary



1km Buffer

Copse by Watford Road



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Figure 2: Map of local wildlife sites within 1km of the site

Date: April 2021





NOTE: Areas are indicative and are not shown to exect scale.



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Figure 3: Protected species records within 1km of the site and bat records within 2km of the site

Date: April 2021

APPENDIX 1 - PROTECTED SPECIES LEGISLATION

Bats

In England and Wales, all bat species and their roosts are legally protected under the Wildlife and Countryside Act (1981) (as amended); the Countryside and Rights of Way Act, 2000; the Natural Environment and Rural Communities Act (NERC, 2006); and by the Conservation of Habitats and Species Regulations (2010). You will be committing a criminal offence if you:

- · Deliberately capture, injure or kill a bat
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats
- Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time)
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat
- Intentionally or recklessly obstruct access to a bat roost

Barbastelle, Bechstein's, greater horseshoe, lesser horseshoe, brown long-eared, soprano pipistrelle, and noctule bats are all priority species under the UK Biodiversity Action Plan (UK BAP) and have also been adopted as species of principal importance in England under Section 41 of the NERC Act 2006.

Badgers

Badgers and their setts are afforded strict protection under the Protection of Badgers Act 1992. This Act consolidates past badger legislation and, in addition to protecting the badger itself, makes it an offence to damage, destroy or obstruct badger setts. Badgers are also protected under Schedule 6 of the Wildlife and Countryside Act 1981 (as amended), and listed under Appendix III of the Bern Convention, as a species that is in need of protection but may be hunted in exceptional instances. Only badger setts that are currently in use are covered by wildlife legislation.

Birds

All wild birds in the UK are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or to take, damage or destroy the nest or its eggs.

Some bird species, such as the barn owl *Tyto alba*, are listed in Schedule 1 of the 1981 Act and receive further protection, making it an offence to intentionally or recklessly disturb these birds whilst building a nest or in, on or near a nest containing eggs or young; or to disturb dependent young of such a bird.

The NERC Act (2006) inserts a new schedule into the Wildlife and Countryside Act (1981) to protect the nests of some bird species that regularly re-use their nests, even when the nests are not in use. This protection currently applies to golden eagle, white-tailed eagle and osprey.

Reptiles

All British reptiles are listed under schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are therefore protected from intentional killing or injury. This is largely as a consequence of a national decline in numbers associated with habitat loss.

Two scarcer native British reptiles (smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis*), are afforded 'full' protection. This legislation makes it an offence to intentionally or recklessly kill, injure, disturb, take, possess or sell these species (in all life stages). It is also illegal to damage, destroy or obstruct access to places they use for breeding, resting, shelter and protection.

All species of reptile are priority species in the UKBAP and have been adopted as Species of Principal Importance under Section 41 of the NERC Act (2006) in England (Section 42 in Wales).

Amphibians

Great crested newts (GCN's) *Triturus cristatus* and their habitats are fully protected by the Conservation of Habitats and Species Regulations (2010) and partially protected under the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to kill, injure or capture GCN's, their young or eggs, or destroy / damage their ponds or places of shelter used for breeding or protection. The great crested newt is also a Priority species in the UK Biodiversity Action Plan (UKBAP), and had been adopted as a Species of Principle Importance in England under Section 41 of the NERC Act 2006.

The natterjack toad *Epidalea calamita* is fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of The Conservation of Habitats and Species Regulations 2010 making it a European Protected Species. The natterjack toad is also a priority species under the UK Biodiversity Action Plan.

The pool frog *Rana lessonae* is protected under the Conservation (Natural Habitats &C.) Regulations 1994 (as amended). As a European protected species the deliberate capturing, disturbing, injuring or killing of this species is prohibited, as is damage or destruction of its breeding sites or resting places. The pool frog is also a priority species under the UK Biodiversity Action Plan due to a 100% decline over 25 years (1980-2005).

Common toads *Bufo bufo* are also designated UKBAP species due to a serious decline of populations across large areas of southern, eastern and central England, thought to be mainly due to changes in habitat management, mortalities on the roads, and climate change.

Dormice

Common dormice *Muscardinus avellanarius* and their habitats are fully protected by both the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations (2010). This legislation makes it an offence to kill, injure, disturb or capture dormice, or destroy or obstruct their resting or breeding places.

The dormouse is also a priority species under the UK Biodiversity Action Plan and has been adopted as a species of Principal Importance in England under Section 41 of the NERC Act 2006 (section 42 in Wales) and so is protected from any adverse effects as a result of development.

Otters

Otters *Lutra lutra* are protected by both the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2010. This legislation makes it is illegal to; deliberately or recklessly kill, injure or capture an otter, deliberately or recklessly disturb or harass an otter, damage, destroy or obstruct access to a breeding site or resting place of an otter.

The otter is also a UK BAP Priority Species and has been adopted as a Species of Principal Importance in England under Section 41 of the NERC Act 2006 (Section 42 in Wales) and the Conservation (Scotland) Act in Scotland.

Water Voles

Water voles *Arvicola terrestris* are fully protected under the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to kill or injure water voles, and to damage, destroy or obstruct access to places used for protection or shelter, and to disturb water voles whilst they occupy such a place.

The water vole is also a Priority species in the UK Biodiversity Action Plan, and had been adopted as a Species of Principle Importance in England under Section 41 of the NERC Act 2006.

White-Clawed Crayfish

The white-clawed crayfish Austropotamobius pallipes is protected under the Wildlife and Countryside Act 1981 (as amended), making it a criminal offence to; intentionally or recklessly kill or injure a white-clawed crayfish, or sell or

attempt to sell any part of this species. The Habitats Regulations (2010) provide further protection through the declaration of Special Areas of Conservation (SAC). This protection aims to prevent commercial harvesting of whiteclawed crayfish and prohibits their capture without a licence.

The white-clawed crayfish is also a Priority species in the UK Biodiversity Action Plan (BAP), and has been adopted as a Species of Principal Importance in England under Section 41 of the NERC Act 2006.

Hedgehogs

Hedgehogs are UK Biodiversity Action Plan (BAP) species, and therefore must be taken into consideration as part of development planning. A recent report (Wembridge, 2011) shows that hedgehog numbers have declined by 25% in the last ten years.

APPENDIX 2 - SURVEY AND REPORTING LIMITATIONS AND EXCEPTIONS

This report and its survey results should be considered in conjunction with the terms and conditions proposed and scope of works agreed between Darwin Ecology Ltd and the client.

This report has been produced in the context of the proposals stated in the Introduction & Background section of this report (Section 2) and should not be used in any other context.

Darwin Ecology Ltd have endeavoured to identify the likely presence / absence of protected species wherever possible on site, where this falls within the agreed scope of works. Current standard methodologies have been used, which are accepted by Natural England and other statutory conservation bodies. No responsibility can be accepted where these methodologies fail to identify all species or significant species on site.

Extended Phase 1 and Preliminary Ecological survey techniques provide a preliminary assessment of the likelihood of protected species occurring on the development site, based on the suitability of the habitats and any field signs found during the site visit. A Phase 1 survey should not be taken as providing a full and definitive survey of any protected species group.

Extended Phase 1 and Preliminary Ecological Appraisals represent a snapshot of conditions at the time of survey and are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. Surveys should therefore not be considered a comprehensive list of all plant species or as conclusive proof that certain protected species are not present or will not be present in the future.

Where the presence/absence of a certain species is in question our ecologists must apply a precautionary approach until further survey data can be sought to better inform the decision.

Darwin Ecology Ltd will advise on the optimum survey season for a particular habitat or protected species prior to undertaking the survey work. Darwin Ecology Ltd cannot accept responsibility for the accuracy of surveys undertaken outside this period.

The potential impacts, mitigation and enhancement sections of the report provide an overview and is for guidance only. This section should not be solely relied upon, but should be considered in the context of the whole report.

Interpretations of survey results and recommendations outlined in the report represent our professional opinions, expressed in accordance with recognised industry practices and current legislation at the time of reporting. The results of survey work undertaken by Darwin Ecology Ltd are representative at the time of surveying.

Where the client had supplied us with data from previous reports, it has been assumed that this information is valid. No responsibility can be accepted by Darwin Ecology Ltd for inaccuracies within any previous data supplied.

The copyright in this report, plans and other associated documents prepared by Darwin Ecology Ltd is owned by them and no such report, plans and other associated documents may be reproduced without their written consent.

Amendments to this report after its submission may be necessary in light of new, relevant information and / or legislation. This report should be referred to us for re-assessment if any such amendments are necessary or after the expiry of one year from the date of the report.





Bats favour a dark environment for both roosting and foraging as they are adapted to low-light conditions. Artificial lighting will disturb bats if the lighting covers roost access points, flight paths or foraging habitats.

The main peak of nocturnal insect abundance occurs at dusk and a delay in emergence results in a lower foraging rate for bats.

Artificial lighting creates a 'vacuum effect' for nocturnal insects. During the night nocturnal insects use the light of the moon* to navigate. However, artificial lighting and even sky glow above cities obscures the natural moonlight as it is closer and radiates light in multiple directions.

Some species of bats have been recorded foraging around street lights such as Pipistrelle species and Nyctalus species. However, species that are less tolerant of artificial light are at a disadvantage when foraging as insects are drawn away from these species usual foraging grounds into the zones of artificial light.

Lighting must be considered in context to any development as increased lighting may cause roost abandonment, reduced reproductive success, and reduced foraging. Mitigation to reduce the impacts of lighting for bats is therefore of great importance in bat conservation.

Impact Behaviour	High	Medium	Low
Maternity roost	All species		
Night roost	Rhinolophus hipposideros Rhinolophus ferrumequinum Myotis spp. Piecotus spp.	Pipistrellus spp. Nyctalus spp. Eptesicus serotinus Barbastella barbastellus	
Emergence	All species	-	2
Foraging	Rhinolophus hipposideros Rhinolophus ferrumequinum Myotis spp. Piecotus spp.	•	Pipistrellus spp. Nyctolus spp. Eptesicus serotinus Barbastella barbastellus
Commuting	Rhinolophus hipposideros Rhinolophus ferrumequinum Myotis spp. Plecotus spp.		Pipistrellus spp. Nyctalus spp. Eptesicus serotinus Barbastella barbastellus
Swarming	All species		•
Hibernation	All species		

Table 1: Summary of predicted impact of lighting for each species/genus

*For more information see Warrant, E., and Dacke, M. (2016) Visual Navigation in Nocturnal insects. Physiology, 31, 182-196.



Sources of light that can disturb bats include; light spill via windows, sport floodlighting, car headlights, roadside lighting, security lighting, aesthetic lighting of waterways, and aesthetic illumination of buildings. Glare will affect bats over greater distance than the target area directly illuminated.

Avoidance is the most effective method, but if this is not possible the following measures should be considered.

What lighting should I use?

- Low pressure sodium lights or 'warm' LEDs
- Wavelength above 540nm
- Colour temperature below 2700K
- Shielded lights that prevent light spill above a 70 degree angle
- Passive infrared (PIR) motion sensors





What to avoid:

- · Lighting roost entrances, flightpaths, and foraging or commuting routes
- Reflective surfaces beneath lighting
- High level lights
- Non-directional lighting

Lighting should be considered at an early stage allowing impacts to be minimised through the design of the site.

Key Points

- · Keep lighting intensity to the minimum level required
- Limit the times that lights are on to provide some dark periods (e.g. switching installations off between midnight and 5am)
- Dim lighting according to demand
- As an alternative to lighting pathways use paving materials that reflect moonlight
- Low level lighting allows darkness to be retained within higher vegetation
- Set dark habitat buffers lighting should always be a minimum of 25m from vegetated margins and 40m from waterbodies
- · Incorporate dark corridors within the site
- · Compensate for the loss of dark areas by enhancing other dark areas
- Consider building design install internal lighting away from windows

Bat Conservation Trust guidance note 08/18 'Bats and artificial lighting in the UK & http://www.cost-lonne.eu/recommendations/

Appendix 3: Bat Boxes

Installation of bat boxes on trees

- These need to be installed at a height of at least 4m.
- In a un-cluttered location on the tree, no branches obstructing the flight path of bats to the box entrance
- Preferably on a southern aspect with good connectivity to linear features such as other mature trees and hedgerows.
- Please note that once bats have inhabited a roost site they may only be disturbed by licensed bat workers.



2F Schwegler Bat Box with Double Front Panel

This box has a front panel with a second inner wooden panel fitted to it to create a cavity wall. This provides ideal quarters for bats that inhabit crevices, such as Nathusius' Pipistrelle (Pipistrellus nathusii), Daubenton`s Bat (Myotis daubetonii) and the Common Pipistrelle (Pipistrellus pipistrellus).

It has been designed as a summer roosting space for bats and has a simple entrance hole at the front. The 2F Double Front Panel is manufactured from long-lasting Woodcrete, which is a blend of wood, concrete and clay which will not rot, leak, crack or warp, and will last for at least 20 – 25 years, making it suitable for long-term mitigation projects.

The 2F Double Front Panel bat box can be sited in trees or on buildings and is best positioned at a height of between 3 to 6 metres.







3FN Schwegler Bat Box

The 3FN bat box is manufacture from long lasting Woodcrete, making it ideal for long term mitigation projects.

The 3FN has two entrances, one at the back of the box next to the tree trunk and the other at the front of the box. The small front entrance provides protection against natural predators. The entrance area is stepped providing protection against small predators, draughts and bright lights.

The 3FN bat box is provided with a hanger and aluminium nail and should be sited in trees and is best positioned at a height of between 3 to 6 metres.

Bat boxes should ideally be sited in open sunny positions.







TYPES OF BIRD BOXES



Vivar Pro Seville 32mm WoodStone Nest Box

- · Manufactured from woodstone increases longevity and provides a consistent internal temperature
- The nest box compensates for the lack of natural cavities that are found in trees
- Suitable for blue tits, tree sparrows, house sparrows, great tits, crested tits, nuthatches, coal tits and pied flycatchers
- Should be installed between 1.5m and 3m high



House Martin Nest Cups



Swallow Nest Bowl

- Suitable nest building mud is difficult for house martins and swallows to find
- · Alterations to house construction and roof design have resulted in a decrease of suitable nesting sites
- · Install swallow nest bowls within an outbuilding or garage that has flight access 6cm below the ceiling
- · Install house martin nest cups under the eaves of a house minimum of 2m high



Swift Nest Box

- Swift numbers are declining partly due to a loss of nesting sites
- The entrance hole discourages other birds such as starlings and sparrows
- · Install a minimum of 5m high with unobstructed airspace in front of the nest
- Integrated models of swift nest boxes are also available

Bird Boxes





5KL Schwegler Nuthatch Nest Box

- · Manufactured from woodcrete
- Nuthatches prefer nest boxes with larger cavities. They will often occupy owl nest boxes and fill the entrance hole with mud reducing the size to approximately 32mm
- Nuthatches plaster mud on the internal walls of the cavity and line the floor with wood chipping and leaves to nest
- To discourage nuthatches from using owl nest boxes try installing the 5KL immediately adjacent

Open-fronted Nest Box

- Manufactured from woodstone lifetime of 20-25 years
- Suitable for robin, wren, spotted flycatchers, and black redstart
- Best installed hidden from view on the wall of a building or hidden within ivy/honeysuckle as the boxes open-front may attract predators
- Install at a height of 1-3m



Sparrow Terrace Next Box

- · Sparrow populations are decreasing due to a lack of nesting sites
- Sparrows are a sociable species and prefer to nest in a colony
- Likelihood of uptake is increased if more nesting chambers are available (the example nest box shown contains three nesting chambers)
- · Various other nest box designs are available
- Install at a minimum of 2m high



Tawny Owl Nest Box

- · Install on a mature tree within a woodland (not on the outskirts)
- Install a minimum of 3m high
- Face the box entrance away from prevailing wind (generally avoiding west/south-west)



Little Owl Nest Box

- Prefer areas of mixed farmland and orchards
- Essential features; small entrance hole (70mm), narrow tunnel, and a dark nesting chamber
- Install on a horizontal tree branch/wall top or beam so that
 owlets can walk in/out prior to fledging
- Can be installed on any tree species apart from cherry the cherry harvest coincides with the little owl breeding season
- Entrance hole should face the tree trunk
- Install at a minimum height of 3m

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Bird Boxes