Ecological Due Diligence Report

Cambridge Road, Sawbridgeworth

On Behalf of:

Countryside Properties

July 2017

www.ses-eco.co.uk

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Appendices

1.0 Introduction and Aims

1.1 Southern Ecological Solutions Ltd (SES) was commissioned by Countryside Properties to visit the land off Cambridge Road, Sawbridgeworth as (see Appendix 1) to undertake an ecological due diligence report.

1.2 The objectives of this report are to:

- Identify invasive plant species listed under schedule 9 of the Wildlife and Countryside Act 1981;
- Highlight the main ecological features within the site;
- Make an initial assessment of the likely presence or likely absence of species of conservation concern;
- Identify any legal and planning policy constraints relevant to nature conservation which may affect the development;
- Determine any potential further ecological issues;
- Determine the likely need for further surveys, mitigation and budget costs.

1.3 The site survey was carried out by Andrew Pankhurst BA(Hons) ACIEEM in June 2017. Weather conditions were suitable for survey. Most of the site was accessible during the walkover but areas of dense scrub, buildings and fields occupied by livestock and electric fencing were not. Fields with livestock and electrified fencing were surveyed from the field boundary only. Detailed protected species surveys were not undertaken and the likely presence is made on professional judgement.

2.0 Methodology

Desktop Work

2.1 Records were obtained from Essex Field Club and The Herts Biological Records Centre for protected and notable species up to 2km from the proposed development site boundary.

Site Walkover

2.2 The field survey comprised of a walkover of the site and adjacent areas. Incidental records of fauna, and field signs thereof, were made during the survey, and the habitats identified were evaluated for their potential to support legally protected species and other species of conservation concern, including Herefordshire Local Biodiversity Action Plan (LBAP) and Natural Environment and Rural Communities (NERC) Act species and habitats of principal importance.

3.0 Site Description

3.1 The site is located on the northern tip of Sawbridgeworth, Hertfordshire. Beyond the eastern boundary is what appears to be a traveller's site containing mobile homes. Further east still the landscape is dissected by a railway line, with the River Stort and its riverine corridor also found meandering north/ south through the landscape. North of the site, residential dwellings and gardens are associated with Cambridge Road. Further north grazing pasture and arable farmland are typical habitats. The town of Sawbridgworth dominates the landscape south with arable farmland the prevalent habitat west of the site.

3.2 The site itself is consists of Northfield House and associated gardens. Habitats found include buildings, hedgerows, scattered trees, amenity grassland, scrub, hardstanding and brash piles. Other habitat of note includes deadwood stumps. A Public Right of Way (PRoW) and track is found south of Northfield House, this track appears to serve as access to the traveller's site. A section of the PRoW then heads south into Marlands (adjacent south of the site). A further pathway runs north from the PRoW, immediately east of Northfield House's boundary. Further east, grazed pasture with isolated patches of dense scrub and a small pond were recorded. Heading south across the track there is a network of small improved / semi improved grassland fields which are heavily grazed by cattle and horses. Moving west through these fields and crossing the PRoW (which connects to Marlands) tall ruderals and a line trees /scrub bound a small field. Piles of brash from recent management/ removal of scrub /hedgerow adjacent to the Cambridge Road boundary were noted. This field contains semi improved grassland that is presently not subject to management and thus is tussocky in nature.

4.0 Assessment of Constraints and Opportunities

Data Search – Designated Sites

4.1 SES commissioned a data search for records of protected and notable species and designated sites via the Essex Field Club (EFC) and the Herts Environmental Records Centre (HERC). Furthermore, records of hazel dormouse *Muscardinus avellanarius* were searched for using National Biodiversity Network (NBN) Atlas which holds data from the People's Trust for Endangered Species (PTES).

4.2 A web-based search for statutory designated sites via the MAGIC spatial data resource was undertaken on 07/07/2017 for the following designations: European designated sites (up to 8km from the site boundary); and national (5km from the site boundary). SES commissioned a non-statutory site search from HERC and the Essex Wildlife Trust (EWT) (2km from the site boundary).

4.3 A number of protected and notable species were recorded during the desktop data search within 2km from the site.

4.4 European protected species are animals and plants listed in Annex IV of the European Habitats Directive (1992) as amended which receive protection in the UK under Regulation 41 of The

Conservation of Habitats and Species Regulations (CSHR) (2010). European protected species recorded within 2km of the proposed development site are shown in Table 1 below.

Table 1: European legally protected species recorded within 2km of the site from EFC data search.

European Protected Species	Number of records	Closest Record (km)	Last recorded
Brown long-eared bat *Plecotus auritus*	16	2.7	2015
Common pipistrelle *Pipistrellus pipistrellus*	31	0.3	2016
Daubenton's bat *Myotis daubentonii*	3	2.1	1997
Great crested newt *Triturus cristatus*	2	2.6	2003
Leisler's bat *Nyctalus leisleri*	6	2.6	2006
Long-eared bats *Plecotus sp.*	5	2.7	2014
Natterer's bat *Myotis nattereri*	2	2.6	2004
Noctule *Nyctalus noctula*	4	1.1	2014
Otter *Lutra lutra*	16	0.9	2016
Pipistrelle sp. *Pipistrellus*	29	2.5	2010
Soprano pipistrelle *Pipistrellus pygmaeus*	6	1.6	2014
Unidentified bat *Chiroptera*	5	N/A	1999
Whiskered bat *Myotis mystacinus*	3	N/A	2000

4.5 UK protected species are animals and plants protected within one or more of the following: Wildlife and Countryside Act (WCA) (1981) as amended and The Protection of Badgers Act 1992, records of which are found in Table 2 below. Species listed on the Natural Environment and Rural Communities (NERC) Act (2006) (previously UK Biodiversity Action Plan species) section 40 and 41 found within 2km of the site are listed in Table 3 below.

Table 2: UK legally protected species recorded within 2km of the site from a data search.

UK Protected Species	Number of records	Closest Record (km)	Last recorded
[redacted]			
Common lizard *Zootoca vivipara*	4	0.5	2009
Grass snake *Natrix natrix*	8	0.3	2013
Northern water vole *Arvicola amphibius*	13	0.4	2004

Table 3: UK BAP / NERC species recorded within 2km of the site from a data search.

UK BAP / NERC Protected Species	Number of records	Closest Record (km)	Last recorded
Brown hare *Lepus europaeus*	3	0.5	1905
Harvest mouse *Micromys minutus*	5	0.5	2007
Western hedgehog	7	0.5	2004

4.6 Schedule 1 birds reported include kingfisher *Alcedo atthis*, Cetti's warbler *Cettia cetti*, and red kite *Milvus milvus.* Schedule 8 species include bluebell *Hyacinthoides non-scripta*. Schedule 9 species were not reported. Notable invertebrate species include several species of moth and a hoverfly.

4.7 The desk study also highlighted a number of designated sites via EFC, EWT and Magic Map within the following designations: European (approx. 8km from the site boundary) and national (approx.

5km from the site boundary (Table 4). A non-statutory (approx. 2km from the site boundary) site search was undertaken with the EWT, the results of which are found within Table 5.

Table 4: Statutory designated protected sites within the vicinity of the site, listed in order of distance.

Site Name	Distance and Direction from Site	Size (Ha.)	Reason for Designation
Sawbridgeworth Marsh SSSI	0.4km east	6.3	One of the few remaining intact river valley marshes in Hertfordshire, the site supports an important invertebrate fauna.
Little Hallingbury Marsh SSSI	1.2km north	4.5	The site is designated for its importance for overwintering birds, and forms a significant part of the regionally important network of wetland feeding and roosting sites for birds along the Stort Valley.
Thorley Flood Pound SSSI	1.6km north	17.3	The site includes tall wash grassland, a rare habitat in Essex and Britain. The site provides habitat for a number of wildfowl and ground nesting birds.
Hatfield Forest SSSI NNR	4.1km north-east	403.2	Hatfield Forest is one of the last small medieval Royal Forest to remain virtually intact in character and composition. It is designated for its areas of ancient woodland, ancient wood pasture and grasslands.
Harlow Marsh LNR	4.9km south-west	13.77	The reserve is designated for its wide range of wetland habitats.

Statutory Designated Sites: SSSI = Site of Special Scientific Interest; **NNR** = National Nature Reserve; **LNR** = Local Nature Reserve

Table 5: Non-statutory designated sites within the vicinity of the site, listed in order of distance.

Site Name	Distance and direction from site	Size (Ha.)	Description
Tednambury Meadows LWS	0.25km east	7.42	A complex of unimproved, wet, neutral grassland with areas of marsh, tall fen, raised, dry disturbed grassland, scrub and areas of dry and wet broadleaved woodland. The site support a diverse assemblage of plants including many indicator species such as Common Knapweed (Centaurea nigra), Common Sorrel (Rumex acetosa), Meadow Vetchling (Lathyrus pratensis), Bird's-foot Trefoil (Lotus corniculatus), Lady's Bedstraw (Galium verum), Marsh Marigold (Caltha palustris), Marsh Thistle (Cirsium palustre), Marsh Horsetail (Equisetum palustre), Ragged Robin (Lychnis flos-cuculi) and Fen Bedstraw (Galium uliginosum). Species of particular note recorded include Common Sedge (Carex nigra), Common Spike-rush (Eleocharis palustris), Blunt-flowering Rush (Juncus subnodulosus), Brown Sedge (Carex disticha), Wood Small-reed (Calamagrostis epigejos), Marsh Arrowgrass (Triglochin palustre), Marsh Valerian (Valeriana dioica), Marsh Marigold (Caltha palustris) and Southern Marsh-orchid (Dactylorhiza praetermissa). Wildlife Site criteria: Grassland indicators; fen and swamp indicators.

Sawbridge worth Marsh South & North East LWS	0.5km south	2.76	This site has been left as a result of removing SSSIs from Wildlife Sites. It will be reviewed once survey data and a site assessment have been carried out. Wildlife Site criteria: Buffers an SSSI.
Sawbridge worth Meadows LWS	0.6km south	17.69	A large area of old neutral grassland, of varying wetness, along the Stort valley. The grassland is generally rank and contains uneven tussocky ground with areas of scrub, marsh and swamp, and a network of ditches partly lined with Crack Willow (Salix fragilis) and shrubs. Relict meadow species include Meadow Buttercup (Ranunculus acris), Common Sorrel (Rumex acetosa), Meadow Vetchling (Lathyrus pratensis), Lady's Smock (Cardamine pratensis) and Common Fleabane (Pulicaria dysenterica). Wetter areas support species such as Meadowsweet (Filipendula ulmaria), tall sedges (Carex spp.), Marsh Horsetail (Equisetum palustre) , Marsh Thistle (Cirsium palustre), Reed Sweet-grass (Glyceria maxima), rushes (Juncus spp.) and Reed Canary-grass (Phalaris arundinacea). The ditches and the River Stort, which flows through part of the site, support tall marginal fen/swamp species and some aquatics. Two large Black Poplars (Populus nigra) are present beside the river. Water Vole (Arvicola amphibius) and Harvest Mouse (Micromys minutus) have been recorded on the site. Wildlife Site criteria: Grassland indicators; fen and swamp indicators.
Spill Timbers Wood LWS	0.7km east	0.9	With several indicator species present, this site is designated for its possibility as ancient woodland.
Scrub E. of Railway, Sawbridge worth LWS	0.8km south	1.58	Area of mixed species scrub with rank grassland in the north and remnant rank tall fen vegetation in the south with some Crack Willow (Salix fragilis). The northern area of grassland is now partly occupied by a car park and supports common grasses and herbs, particularly of disturbed ground. The wet habitat in the south is dominated by large sedges (Carex sp.). A ditch runs alongside the railway to the west and a hedgerow borders the road in the east. Wildlife Site criteria: Fen and swamp indicators.
Hallingbury Mill Pastures	0.9km north	7.7	The site is comprised of a series of river flood plain grasslands, a scarce habitat in Essex. There is a good variety of aquatic flora and invertebrates, and the site is believed to be valuable as feeding areas to waterfowl.
Meadow S. of Spellbrook LWS	1.1km north	0.67	Marsh and tall swamp habitat with some scrub and much planted willow, including Goat Willow (Salix caprea), Cricket-bat Willow (S. alba var. caerulea) and White Willow (S. alba). The swamp is dominated by Common Reed (Phragmites australis) with species such as Lesser Pond-sedge (Carex acutiformis), Common Nettle (Urtica dioica), Great Willowherb (Epilobium hirsutum), Meadowsweet (Filipendula ulmaria), Wild Angelica (Angelica sylvestris), Hemp-agrimony (Eupatorium cannabinum), Marsh Bedstraw (Galium palustre) and Marsh Thistle (Cirsium palustre) also recorded. A ditch crosses the

			site and substantial mixed species hedgerows and ditches occur to the boundary in places. Wildlife Site criteria: Fen and swamp indicators.
Oak Spring LWS	1.3km east	1.7	The flora and structural composition suggest this woodland is ancient, although too small to appear on the Ancient Woodland Inventory.
Hyde Hall Wood LWS	1.5km east	0.2	This small fragment of woodland is designated for its lowland mixed deciduous woodland (a BAP habitat), that may be considered to be ancient.
Rivers Nursery LWS	1.6km south-west	10.02	A former nursery site supporting a mosaic of habitats including semi-improved neutral grassland, scrub and old orchard trees. The grassland is reasonably diverse and supports a number of indicator species including Agrimony (Agrimonia eupatoria), Common Knapweed (Centaurea nigra), Common Centaury (Centaurium erythraea), Meadow Vetchling (Lathyrus pratensis), Oxeye Daisy (Leucanthemum vulgare) and Wild Marjoram (Origanum vulgare). The orchard to the west also has a good grassland flora with abundant Black Knapweed and Agrimony. Large numbers of Bee Orchid (Ophrys apifera) have been recorded. Scrub is predominantly of Hawthorn (Crataegus monogyna) and Blackthorn (Prunus spinosa) with some Dog-rose (Rosa canina). Wildlife Site criteria: Grassland indicators.
Round Spring LWS	1.7km east	1.4	The flora and structural composition suggest this woodland is ancient, although too small to appear on the Ancient Woodland Inventory.

Non-statutory Designated Sites: LWS = Local Wildlife Site

Invasive Species

4.8 No invasive species listed within schedule 9 of the Wildlife and Countryside Act 1981 was identified during the site walkover. Parts of the site were inaccessible and could not be fully assessed. In addition, just offsite to the south are signs of recent dumping and a risk that species such as Japanese knotweed could be a problem if this activity continues.

4.9 Snowberry *Symphoricarpos sp.* was recorded within the tree belt which separates Northfield House and the PRoW. This species is not listed on schedule 9 but is considered to invasive and detrimental to biodiversity.

Recommended Survey and Likely Mitigation

4.10 An extended phase 1 habitat survey is recommended which will identify botanical species; this survey can be used to identify invasive species. It is also recommended that should an extended period of time elapse after this survey is complete, a further walkover is undertaken prior to construction. Snowberry should be removed where possible.

Protected Habitats

Designated Sites

4.11 The site is c.0.4km from Sawbridgeworth Marsh SSSI and falls within Natural England's 'Impact Risk Zone' for residential development of 100 units or more or any residential development of 50 or more houses outside existing settlements/urban areas. There are also a number of LWS in the locality. It is therefore considered that the development in the absence of mitigation may result in indirect/ direct significant effects upon Sawbridgeworth Marsh and potentially the LWS's.

Recommended Survey and Likely Mitigation

4.12 It is recommended that a designated sites impact assessment is undertaken to guide what if / any mitigation is required. Mitigation will likely take the form of suitable levels of public openspace and potentially a developer contribution to management / protection of Sawbridgeworth Marsh.

Policy Compliance following mitigation

4.13 The above mitigation is In accordance with:

- ENV13- Developments and SSSI's
- ENV14- Local Sites

Habitats

4.14 The site primarily consists of heavily grazed fields which are considered to be of inherently low ecological value. Notwithstanding there are a number ecological features throughout site such as

hedgerows/ scrub/ trees within Northfield House and the field to the south west of the site which also contains tussock grassland.

Trees / Tree Belts/ Hedgerows

4.15 Some of the hedgerows on site are considered to meet the definition for classification as a UK BAP/NERC Act habitat of principal importance. This is due to the hedgerows composition being more than 80% UK native woody species. None of the hedgerows are considered likely to have the potential to meet the definition of an 'important' hedgerow under the Hedgerow Regulations (1997) due to their species richness.

4.16 The hedgerows on site also have the potential to be of value to notable and legally protected species such as bats and reptiles. This habitat also provides foraging and nesting habitat for birds and may also provide habitat for UK BAP species such as the European hedgehog.

Recommended Survey and Likely Mitigation

4.17 An extended phase 1 habitat survey should be undertaken to map the existing habitats currently present on site to inform the current ecological baseline. This survey will also confirm the absence of hedgerows considered to be 'important' under the Hedgerow Regulations 1997.

4.18 Retention of hedgerows where possible. Replacement planting of that lost to create continuous lengths of species rich hedgerows, preferable to achieve a net gain in habitat. Retained hedgerows should be 'gapped up'.

4.19 Retain mature trees where possible, rotting tree stumps within the boundary habitats of Northfield House should be retained or moved to suitable location such as a landscape screen.

4.10 Hedgerows and trees around the boundaries or those forming ecological corridor should be buffered/ subject to wildlife friendly lighting from light pollution.

Policy Compliance following mitigation

4.11 The above mitigation is In accordance with:

- ENV10 Planting New Trees
- ENV11 Protection of Existing Hedgerows and Trees
- ENV17 Wildlife Habitats
- ENV23 Light Pollution and Floodlighting

Protected Species

Bats

4.12 All bat species are legally protected under section 9 of the WCA 1981 and regulation 41 of the CHSR 2010. As such, bats are a material consideration when determining a planning application.

4.13 Several species of bat were identified within 2km of the site in the datasearch (Table 6 below), the closest record being a common pipistrelle, occurring 0.3km from the site in 2016.

Table 6: Bats identified in the 2km datasearch.

Bat Species	Number of records	Closest Record (km)	Last recorded
Brown long-eared bat *Plecotus auritus*	16	2.7	2015
Common pipistrelle *Pipistrellus pipistrellus*	31	0.3	2016
Daubenton's bat *Myotis daubentonii*	3	2.1	1997
Leisler's bat *Nyctalus leisleri*	6	2.6	2006
Long-eared bats *Plecotus sp.*	5	2.7	2014
Natterer's bat *Myotis nattereri*	2	2.6	2004
Noctule *Nyctalus noctula*	4	1.1	2014
Pipistrelle sp. *Pipistrellus*	29	2.5	2010
Soprano pipistrelle *Pipistrellus pygmaeus*	6	1.6	2014
Unidentified bat *Chiroptera*	5	N/A	1999
Whiskered bat *Myotis mystacinus*	3	N/A	2000

4.14 The main building 'Northfield House' and garage are in good repair with no external bat field signs recorded (from ground level). However the main building is of an age and structure which may provide internal bat roosting potential. Most trees onsite are considered to provide low bat roosting potential (Collins, 2016) with one tree providing moderate potential.

4.15 Boundary and grassland/ tall ruderal habitats provide foraging and commuting habitat, overall the site is considered to offer low quality foraging habitat (Collins, 2016).

4.16 Despite the low quality foraging habitat present on site, it is considered likely that some individuals highlighted by the datasearch may utilise the site, given the proximity of some of the records identified.

Recommended Survey and Likely Mitigation

4.17 It is recommended that the buildings are internally inspected, including the loft cavity, for roosting bats. This will inform the need for further bat roost surveys. In addition if the tree displaying moderate roosting potential is impacted directly/ indirectly then it is recommended that an aerial inspection is undertaken to ascertain the presence or absence of roosting bats and assign a roosting value in the absence of bats. Subject to the aerial inspection further roost surveys maybe necessary.

4.18 Following best practise guidance (Collins, 2016) bat transect activity surveys should be undertaken from spring, summer and autumn consisting of one visit for each season. In addition

static detectors should be deployed on one location per transect with data collected on 5 consecutive nights per season (spring, summer and autumn). However if this does not fit the development timetable a precautionary mitigation approach can be adopted through the retention/ creation of boundary hedgerows and planting species of benefit to bats. In addition to a wildlife friendly lighting strategy will be required in these areas. The precautionary approach does expose a risk to the application that all information on protected species (material consideration to planning process- NPPF) has not been appropriately gathered but SES have successfully used this approach in the past.

4.19 Should any roosts be found on site, compensatory roosts will need to be provided. The extent of the compensation will be determined by the results of the survey. A Natural England European protected species licence would need to be applied for in advance of any demolition/construction works. Timing of mitigation and destruction works is dependent upon the type of roost found (timing can be found table 7 below). The results of the activity survey will provide data on how bats are presently using the site and also what habitats are important and should be retained / compensated e.g. inform hedgerow retention.

Table 7: Bat survey and potential mitigation timings

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Hibernation												
Activity												
Emergence												
Mitigation (under licence):												
Maternity Roost												
Summer Roost												
Transitory Roost												
Hibernation Roost												
Key:												
	Survey period								Demolition period			
	Optimum period											

Policy Compliance following mitigation

4.20 The above mitigation is In accordance with:

- ENV10 Planting New Trees
- ENV11 Protection of Existing Hedgerows and Trees
- ENV17 Wildlife Habitats
- ENV16 Protected Species
- ENV23 Light Pollution and Floodlighting

Great crested newt

4.21 Great crested newts *Triturus cristatus* (GCN) are legally protected under Section 9 of the WCA 1981 and regulation 41 of the CHSR 2010, and as such, the species is a material consideration when determining the outcome of a planning application.

4.22 Two records of GCN were identified by the datasearch, the closest being 2.6km away from site, in 2003.

4.23 A waterbody onsite was subject to Habitat Suitability Assessment (HSI) (Oldham, 2000) and returned a score of 'poor' and is not considered to be a suitable breeding resource. Using aerial mapping (www.promap.co.uk) the closest pond to site with ecological connectivity i.e. no substantial barriers to dispersal is c.350m away. Research undertaken by English Nature (Cresswell, 2004) indicates it is most common to encounter great crested newts within 50m of a breeding pond, with few moving further than 100m from a breeding pond unless significant linear features are involved when great crested newts can be encountered at distances of between 150m – 200m. At distances greater than 200-250m great crested newts are hardly ever encountered. Given the poor quality of the waterbody onsite and the distance to the next closet pond it considered that great crested newts are unlikely to be utilising habitats onsite and no further survey is recommended.

4.2

4.2

4.2

4.2

4.2

[redacted]

Policy Compliance following mitigation

4.30 The above mitigation is In accordance with:

- ENV16 Protected Species

Reptiles

4.31 The four widespread species of UK reptiles, slow-worm *Anguis fragilis*, common lizard *Zootoca vivipara*, grass snake *Natrix natrix* and adder *Vipera berus* are legally protected in the UK under the WCA 1981 (as amended).

4.32 Two common reptile species were identified within 2km of the site; grass snake and common lizard (Table 9 below).

Table 9: Common reptile species identified within 2km of site

UK Protected Species	Number of records	Closest Record (km)	Last recorded
Common lizard *Zootoca vivipara*	4	0.5	2009
Grass snake *Natrix natrix*	8	0.3	2013

4.33 Given the proximity of reptiles identified in the data search to site, it is considered possible that habitats on site of value to reptiles may be utilised by these individuals.

4.34 Much of the site does not contain suitable reptile habitat such as amenity grassland and heavily grazed pasture. However suitable habitats for reptiles is present which could support a viable reptile population such as hedgerows, scrub, grassland field margins and tall ruderals. The site is also connected to adjacent suitable habitat and is considered to be ecologically connected to the wider landscape.

Recommended Survey and Likely Mitigation

4.35 It is recommended that a seven visit presence/likely absence reptile survey is undertaken (Froglife, 1999 & Gent and Gibson, 2003). Visits should be made during optimum weather conditions from March to September inclusive. If surveys confirm the presence of reptiles on site, likely mitigation will include: fencing works to prevent reptile egress/access, a period of trapping (dependent on the population size found) and translocation to a suitable receptor site (onsite the preferred option-along the eastern boundary seems to be the most viable location) and enhancement of the receptor site. The reptile receptor site should be constructed prior to translocation taking place.

Table 10 : Reptile survey and potential mitigation timings

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Presence/ Absence												
Mitigation:												
Fence erection												
Trapping/ Translocation												
Receptor site enhancement												
Key:												
	Survey period				Optimum survey period				Mitigation works period			

Policy Compliance following mitigation

4.36 The above mitigation is In accordance with:

- ENV17 Wildlife Habitats
- ENV16 Protected Species

Birds

4.37 All breeding birds, their nests and eggs are protected under the WCA 1981 (as amended), and it is an offence to intentionally take, damage or destroy the nest of any wild bird. In addition schedule 1 species are also protected from disturbance while nesting.

4.38 Records of several schedule 1 bird species were identified within the datasearch. Redwing *Turdus iliacus*, barn owl *Tyto alba*, bearded tit *Panurus biarmicus*, fieldfare *Turdus pilaris*, green sandpiper *Tringa ochropus*, greenshank *Tringa nebularia*, kingfisher, osprey *Pandion haliaetus*, and wryneck *Jynx torquilla* were all identified within 510m of site. Given the habitats present on site, it is considered very unlikely that these Schedule 1 species would utilise the site for nesting. There is potential for species such as barn owl to forage/hunt in areas of tussock grassland on site.

Recommended Survey and Likely Mitigation

4.39 The hedgerows, trees and wooded habitats on site provide nesting opportunities for birds but a breeding bird survey is not considered to be necessary to inform the planning application due to the habitats present onsite.

4.39 Any work that would involve the loss of, or damage to, nesting bird habitat should be undertaken outside of the main nesting bird season (March to August inclusive) to avoid destruction of an active nest. If this option is not available, the works should be carried out under the supervision of a suitably qualified ecologist, or immediately after a suitably qualified ecologist has declared that nesting birds are absent. Mitigation for loss of habitat will include sensitive landscaping scheme and the provision of bird boxes

Policy Compliance following mitigation

4.40 The above mitigation is In accordance with:

- ENV10 Planting New Trees
- ENV11 Protection of Existing Hedgerows and Trees
- ENV17 Wildlife Habitats
- ENV16 Protected Species
- ENV23 Light Pollution and Floodlighting

Table 11 : Bird survey and mitigation timings

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nesting bird season (general)												
Mitigation:												
Key:												
	birds actively breeding (general)											

Invertebrates

4.41 A number of habitats within the site are suitable for noted invertebrates including the decaying wooden broadleaved stumps within the residential garden. These stumps are considered to provide suitable habitat for stag beetle (UK NERC Species and LBAP species).

4.42 No records for stag beetle were identified within the datasearch. Notable invertebrate species identified include several species of moth, a hoverfly, and Desmoulin's whorl snail *Vertigo moulinsiana*, the latter of which is listed as an annex 2 species for several SAC designated sites throughout the country. It is considered that Desmoulin's whorl snail is highly likely to be absent from site, due to its preference for wetland and marsh conditions.

Recommended Survey and Likely Mitigation

4.43 It is recommended that a invertebrate habitat assessment walkover and direct sampling survey is undertaken to inform if further surveys are required, if not this survey will appropriately inform a planning application. Mitigation is likely to include the planting of species of known benefit including providing a nectar resource through the year and appropriate management of habitats. In addition if the rotten stumps cannot be maintained in their current position they should be transplanted / replaced in suitable locations around the site (away from excessive human disturbance and ecological connected to the wider landscape.

Table 12 : Invertebrate survey and mitigation timings

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Direct Surveys												
Mitigation:												
Key:												
	Survey/mitigation period											

Policy Compliance following mitigation

4.44 The above mitigation is In accordance with:

- ENV10 Planting New Trees
- ENV11 Protection of Existing Hedgerows and Trees
- ENV17 Wildlife Habitats
- ENV16 Protected Species
- ENV23 Light Pollution and Floodlighting

NERC Act Species- small mammals

4.45 The site is considered to provide some suitable habitat for European hedgehog *Erinaceus europaeus* and harvest mouse *Micromys minutus* largely limited to hedgerows, wooded belts and taller grassland /tall ruderals.

4.46 Records of brown hare *Lepus europaeus,* harvest mouse, and European hedgehog were all identified within 0.5km of the site. It is considered likely that the harvest mouse and European hedgehog recorded within the datasearch may utilise the site, given the proximity of the records, and the suitable habitat identified on site.

Recommended Survey and Likely Mitigation

4.47 Further habitat assessment can be undertaken any time of year with harvest mouse nest searches best undertaken between October and March. Likely mitigation consists of staged habitat removal during the summer months and compensatory habitats such as long grassland at hedgerows and may also include the provision of hedgehog homes.

Policy Compliance following mitigation

4.48 The above mitigation is In accordance with:

- ENV11 Protection of Existing Hedgerows and Trees
- ENV17 Wildlife Habitats
- ENV23 Light Pollution and Floodlighting

5.0 Ecological Budgets

5.1 Table 13 provides estimates of likely ecological works required. The recommended assessments will further define these figures.

Table 13: Likely Ecological budgets

Work required for planning application and monitoring	Budget Costing (ex vat) (£)
Phase one habitat survey (including invasive species walkover	1,000
Designated sites impact assessment	800
Bat activity + automated survey	3400
Bat internal buildings inspection and emergence survey (worst case)	650-5700
Bat aerial inspection tree and emergence survey (worst case)	750-1800
Reptile survey	2500
Invertebrate assessment survey and worst case survey effort	1000- 3500
Badger	800
NERC ACT small mammals	600
Arboricultural impact assessment	1000
Arboricultural method statement	900
Total	**13,400-22,000**
Likely significant mitigation works required post planning	

Preparation of bat licence (per licence)	2400-4800
Licenced destruction of bat roost within building (likely soft strip of roof)	2500
Cost of replacement roost i.e. within new building*	0-up to £30,000
Cost of replacement roosts for crevice dwelling bats- i.e. bat boxes	80-400
Licensed destruction of bat roost within tree(soft fell)	1000
Cost of replacement roosts for crevice dwelling bats- i.e. bat boxes	80
Reptile capture and translocation**	24,000
Reptile exclusion fencing	5000-10000
Habitat enhancement within receptor site	1500
[redacted]	
Total	**39,560- 77,280**
Grand Total	**55,2960-99,280**

*cost for construction of replacement roost difficult to cost due to construction unknowns.

**assumed medium amount of capture effort required (60 days).

6.0 Conclusions

6.1 The following surveys are recommended to inform a planning application and to adhere to relevant wildlife legislation. Further works have been recommended for the following ecological features with timings of surveys, and likely costs given for each feature within this report:

- Designated Sites Impact Asessment
- Extended phase one habitat survey (including invasive species)
- Bats (activity survey; internal / aerial inspection; emergence/re-entry surveys)
- Reptile presence and likely absence survey
- Invertebrate walkover assessment
- Badger
- NERC Act small mammals

6.2 Where Natural England licenses are required full or reserve matters planning approval will be needed, with all relevant planning conditions discharged before the license is submitted.

6.3 Despite the need for further ecological survey the site considered to be wholly deliverable in compliance with local/ national planning policy and relevant wildlife legislation.

7.0 References

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Appendix 1. Site Topographical Survey