ECOLOGICAL IMPACT ASSESSMENT

FOR

THE WEALD, LAUGHTON

Date of surveys	18th July 2022 September/October 2022
Date of report	7 November 2022
Author	Emma Waller, Constance Tragett, Helen Lucking
Reviewer	Bill Wadsworth
Client name	Jarvis Land Ltd.
Corylus reference	22051

CORYLUS ECOLOGY

Unit A3 Speldhurst Business Park, Langton Road, Speldhurst, Tunbridge Wells, Kent. TN3 0NR
Telephone: 01892 861868 E-mail: info@corylus-ecology.co.uk

Director: H G Wrigley (née Lucking) BSc. MIEEM, CIEEM

Corylus Ecology Ltd Registered in England No 5005553
Registered Office: Henwood House, Henwood, Ashford Kent TN24 8DH
VAT Reg No. 862 2486 14

CONTENTS

1.0	**Introduction**	**1**
2.0	**Methodology**	**2**
3.0	**Results**	**6**
4.0	**Evaluation**	**11**
5.0	**Ecological Impact Assessment**	**13**
6.0	**Conclusions**	**24**

Tables

Table 1 – Bat building, tree and habitat assessment criteria

Table 2 – Evaluation of Reptile Population Status

Table 3 - Priority habitats within 3km of the Site

Table 4 – Reptile results (not within text)

Table 5 – Summary of Ponds within 250m Radius of the Site

Table 6 – Evaluation of ecological features

Table 7 – Mitigation Strategy and Enhancements, Impact Assessment and Residual Effects

Figures

Figure 1 – Phase 1 Habitat Survey Plan

Figure 2 – Annotated Photographs

Figure 3 – Ponds within 250m

Figure 4 – Reptile Plan

Appendices

Appendix 1 – HSI assessment methodology

Appendix 2 – CIEEM Ecological Impact Assessment Guidelines

Appendix 3 – Guidance on artificial lighting for bat

Appendix 4 – Hibernacula and Log Pile specification

1.0 INTRODUCTION

1.1 Corylus Ecology was commissioned to undertake surveys and prepare an Ecological Impact Assessment of an area of land approximately 200m south of the village Laughton, East Sussex, hereinafter referred to as 'the Site'. The Site measures approximately 0.41ha and is centred on OS grid reference TQ 50192 12925.

1.2 The Site is dominated by grassland, with hedgerows bordering the north, east and southern boundaries. Church Lane runs along the east of the Site and a post and wire fence along the western boundary separating the Site from another field. The surrounding landscape is dominated by fields and farmland, with residential dwellings immediately to the south and north.

1.3 The proposals are to redevelop the Site with residential dwellings.

1.4 A Preliminary Ecological Appraisal (PEA) was carried out initially in May 2022 which included a detailed Phase 1 Habitat survey. Following on from the PEA more detailed surveys, specifically for reptiles, were undertaken. Information from the initial PEA was used to inform the design of the scheme to reduce potential impacts on ecological interests.

1.5 The objectives of the surveys were to:

- Classify and map the habitats within the Site according to those within the Phase 1 manual;
- Determine the potential for protected species to occur within the Site;
- Determine the presence / likely absence of reptiles within the Site; and
- Determine the extent for mitigation measures within the proposed development.

2.0 METHODOLOGY

2.1 Desk Study

2.1.1 As part of a preliminary desk study, records of designated sites, priority habitats and granted European Protected Species Mitigation (EPSM) licences within 3km of the Site were sought from the Natural England interactive mapping service 'Multi-Agency Geographic Information for the Countryside' (MAGIC) (Natural England, 2016).

2.2 Phase 1 Habitat Survey

2.2.1 The Site was subject to a Phase 1 Habitat Survey on 17th May 2022. The habitats present on the Site were mapped in accordance with the '*Handbook for Phase 1 Habitat Survey*' (JNCC, 2003). Habitat areas and features of topographical and/or ecological interest were described in the form of target notes. These were later used to create botanical species lists by target note area and also to create a colour coded Phase 1 Habitat map. All nomenclature follows Stace (2019). Non-native or invasive species were also identified and mapped where appropriate.

Survey Constraints

2.2.2 The PEA survey also includes the mapping of invasive botanical species listed under Schedule 9 of the Wildlife and Countryside Act 1981, as well as those classed as rare or declining. However, some botanical species are seasonally constrained and therefore may not be visible on a single survey visit. The survey was undertaken in May, when many plants are visible or flowering.

2.3 Protected Species Assessment

2.3.1 The Phase 1 survey included an assessment of the potential for the Site to support protected species. This type of survey aims to assess the potential for protected species to occur due to the habitats present but it does not include any specific survey methods designed to demonstrate whether the Site is in fact used by such species. The exception is badgers *Meles meles* as field signs associated with this species can be searched for, including latrines, holes, pushes, paths and hairs.

2.3.2 As part of the protected species assessment, a ground level investigation of all suitable trees was carried out to identify bat potential. Bats may use any crack or hole (such as woodpecker holes), splits or flaking bark and ivy (JNCC, 2004). Bats will also use different roosts at different times of the year, therefore it can be difficult to confirm bat roosts in trees. Field signs include dark streaking and droppings under access points. However, even where bats are known to occur, such signs are not always evident. Trees were also noted if they supported ivy *Hedera helix*. Ivy can do one of two things; very old, dense ivy can provide cavities for bats between the thick interwoven stems and the tree trunk or it can conceal features in the tree itself.

2.3.3 In addition, the on-site habitats were assessed for their suitability to support foraging and commuting bats. Trees and habitats were placed into one of four categories as described below (Collins, 2016):

Table 1: Bat building, tree and habitat assessment criteria

Negligible	Habitat, building or tree with negligible features likely to be used by roosting, foraging or commuting bats.
Low	A building or tree with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space for shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated i.e. not very well connected to the surrounding landscape by other habitat.
Moderate	A building or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat, but which are unlikely to support a roost with high conservation status. Continuous habitat connected to the wider landscape that could be used by bats for commuting and foraging, such as lines of trees and scrub or linked back gardens.
High	A building or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis, and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. Continuous, high quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats, such as river valleys, hedgerows, lines of trees and woodland edge.

2.4 Reptile Surveys

Presence / Likely Absence Survey Guidance Summary

2.4.1 For a presence / likely absence survey, Froglife recommend that a minimum of seven survey visits are undertaken in favourable weather conditions. To achieve a satisfactory degree of confidence in a negative result, the survey should be spread over a minimum of 30 days.

2.4.2 Reptile surveys can be undertaken between the months of March and October and the most profitable months for surveying tend to be April, May and September (Froglife, 1999). The Herpetofauna Groups of Britain and Ireland (HGBI) guidance suggests that optimum conditions are temperatures between 9^{O}C and 18^{O}C, with an absence of wind and rain and the best time of day is between 8.30am and 11.00am and between 4.00pm and 6.30pm, depending on the conditions. Peak counts of reptiles can often occur outside those times mentioned above, in particular immediately after rain. The surveys were therefore timed to utilise the best available weather conditions.

2.4.3 The standard survey guidance for reptiles (Froglife, 1999) recommends ten heat traps per hectare. For this survey, a total of 16 traps were placed around the perimeter of the Site in areas considered most suitable for reptiles. The Site area is approximately 0.41ha, therefore this achieved a density of greater than ten per ha following guidance. Heat traps consisted of heavy gauge green mineral roofing felt cut into approximately 0.7m x 1m rectangles, which were orientated to receive the maximum amount of sunshine. Surveys were completed between 15th September and 19th October 2022.

Reptile Evaluation Methodology

2.4.4 Froglife have established criteria for establishing Key Reptile Sites and the criteria is also used in the designation process for Local Wildlife Sites. The scoring system is based upon the maximum number of adult animals: that is all animals recorded excluding hatchlings and juveniles, seen under artificial refugia (placed at a density of a minimum of 10 per hectare) or by general observation by one person, in one day.

Table 2 – Evaluation of Reptile Population Status

Species	Low Population Score 1	Good Population Score 2	Exceptional Population Score 3
Adder	<5	5-10	>10
Grass Snake	<5	5-10	>10
Common Lizard	<5	5-20	>20
Slow Worm	<5	5-20	>20

2.4.5 A Key Reptile Site is identified when a site meets any of the following thresholds:

- Supports three or more reptile species; or
- Supports two snake species; or
- Supports an exceptional population of any one species; or
- Supports an assemblage of species scoring ≥4 points using the above system; or,
- Supports a population of adder scoring >1.

2.4.6 Any other species noted under the refugia were also recorded, principally any amphibian species in terrestrial phase.

2.5 Amphibian Assessment - GCN Habitat Suitability Index (HSI) Survey Methodology

2.5.1 The offsite pond (P1) was subject to an HSI Assessment in June 2022, which followed guidance published by the Amphibian and Reptile Groups (ARG) in 2010. This is a simple field and desk based assessment of waterbodies for their potential to support GCN. The details are provided in Appendix 1

2.5.2 In general, waterbodies/ponds with high HSI scores are more likely to support GCN than those with low scores. However, the system is not sufficiently precise to allow the conclusion that any particular pond with a high score will support newts, or that any pond with a low score will not do so. Therefore professional judgement and consideration of the surrounding habitat and location of the pond are all factors in deciding the suitability of the pond to support GCN, and potential impacts.

2.6 Ecological Impact Assessment

2.6.1 An additional aim of the report is to provide an assessment of the impacts of the proposals on the ecological and biodiversity interest of the Site and to identify and design mitigation that could remove or reduce effects or to provide compensation. The general approach follows the Guidelines for Ecological Impact Assessment in the UK and Ireland (EcIA) produced by the Chartered Institute of Ecology and Environmental Management (CIEEM). These guidelines are web based and subject to review and updating and a summary is provided in Appendix 2.

3.0 RESULTS

3.1 Desk Study

Statutory Designated Areas

3.1.1 There is one Site of Special Scientific Interest (SSSI) within a 3km radius of the Site; Park Corner Heath SSSI. Reasons for its designation include its outstanding assemblage of moths and a varied butterfly fauna including several nationally scarce species. A small section of the Site falls into the SSSI Impact Risk Zone (IRZ) for Park Corner Heath SSSI.

Priority Habitats

3.1.2 Under Section 41 of The Natural Environment and Rural Communities (NERC) Act 2006, the Secretary of State was obliged to publish a Priority Habitats Inventory which is a list of habitats and species of principal importance for the conservation of biodiversity in England. Of these Priority Habitats, six were present within 3km of the Site. These are described below.

Table 3 - Priority habitats within 3km of the Site

Priority Habitats	Coverage within 3km of Site	Distance & Position of closest area
Deciduous Woodland	Small parcels of woodland scattered throughout 0.5ha (closest area)	313m east
Traditional Orchards	One area ca.0.4ha	2.2km west
Lowland Dry Acid Grassland	One area ca.1.3ha	2km north-east
Good quality semi-improved grassland (Non Priority)	33.2ha (total area in 3km) 0.5ha (closest area)	730m north
Coastal and Floodplain Grazing Marsh	19.1ha (total area in 3km) 5.7ha (closest area)	2.4km south-west

Ancient Woodland

3.1.3 There is relatively sparse coverage of ancient woodland within 3km of the Site with the largest areas being of ancient replanted woodland. The nearest woodland fragment of ancient and semi-natural woodland lies at Coopers Farm Shaw, which is located 312m to the east and covers an area of 0.5ha. There is a large expanse of ancient replanted woodland at Vert Wood which is located 1.3km to the north-east and covers an area of 127ha.

EPS Licences

3.1.4 One European Protected Species Mitigation (EPSM) licence has been granted within 3km of the Site and is some 2.4km north-west of the Site. The licence (2018-34803-EPS-MIT) was granted for the destruction of a resting place for common pipistrelle *Pipistrellus pipistrellus* and brown long-eared *Plecotus auritus* and was active between May 2018 and May 2019. No other EPSM licences have been granted for protected species within 3km of the Site.

Great Crested Newt Class Survey Licence Returns

3.1.5 There is one great crested newt *Triturus cristatus* (GCN) class survey licence return within a 3km radius of the Site. This licence return is from 2016 and recorded the presence of GCN within a pond (grid reference TQ502131) approximately 140m north of the Site. There are also six GCN pond survey records within a 3km radius of the Site, all of which recorded the presence of GCN, however these are outside of a 500m radius of the Site, with the nearest some 1.2km south-west.

3.2 Phase 1 Habitat Survey

3.2.1 The Site is located some 3.4km south-west of East Hoathly and some 200m south of the village Laughton. The Site is bordered by residential house to the north and south, with a field adjacent to the western boundary and Church road adjacent to the east. The wider landscape is dominated by fields and farmland, with hedgerows, treelines and fragments of woodlands. The habitats present on Site are shown within Figure 1, with further detail provided by way of specific target notes: these are denoted by the letters 'TN'. Photographs of selected target notes are provided in Figure 2.

Semi-improved Grassland

3.2.2 The Site is dominated by tussocky grassland (TN1), which at the time of the survey was approximately 0.5cm in height and is connected to an adjacent field to the west. There is abundant creeping buttercup *Ranunculus repens* and frequent red clover *Trifolium pratense.* Also present are cock's foot *Dactylis glomerata,* cat's tail *Phleum pratense,* Yorkshire fog *Holcus lanatus,* meadow foxtail *Alopecurus pratensis*, rough meadow grass *Poa trivialis,* common bent *Agrostis capillaris*, lesser stitchwort *Stellaria graminea,* white clover *Trifolium repens,* spear thistle *Cirsium vulgare*, lesser birds-foot-trefoil *Lotus corniculatus*, ox-eye daisy *Leucanthemum vulgare*, broad-leaved plantain *Plantago major*, dandelion *Taraxacum sp* agg., herb Robert *Geranium robertianum*, goosefoot *Chenopodium* sp., common nettle *Urtica dioica*, cleavers *Galium aparine*, meadow buttercup *Ranunculus acris*, white campion *Silene latifolia*, creeping cinquefoil *Potentilla reptans*, common mouse-ear *Cerastium fontanum*, ground elder *Aegopodium podagraria*, bush vetch *Vicia sepium*, common vetch *Vicia sativa*, yarrow *Achillea millefolium*, cow parsley *Anthriscus sylvestris*, hedge bedstraw *Galium mollugo*, knapweed *Centaurea nigra*, meadow vetchling *Lathyrus pratensis*, daffodil *Narcissus* sp., common sorrel *Rumex acetosa*, salad burnet *Sanguisorba minor*, germander speedwell *Veronica chamaedrys* and small willowherb *Epilobium minutum*.

Hedgerows

3.2.3 Hedgerows form the curtilage of the Site on three borders: north, east and south. The eastern hedge (H1) stands approximately 2.5m wide and 1.7m high. No trees are present. This hedge is comprised of hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, bramble *Rubus fruticosus*, rose *Rosa canina*, field maple *Acer campestre*, pedunculate oak *Quercus robur*, elder *Sambuca nigra*, goat's willow *Salix caprea,* variegated box *Buxus supervirens* var. and spindle *Euonymus europaeus.* The understory comprises species similar to TN1, such as Yorkshire fog, cock's-foot, meadow foxtail, cow parsley, yarrow, common bent and lesser bird-foots-trefoil, with the addition of hairy brome *Bromus ramosus*, ribwort plantain *Plantago lanceolate* and hedge garlic *Alliaria petiolata*.

3.2.4 The southern hedgerow (H2) stands approximately 2m tall. This hedge is comprised of hawthorn, beech *Fagus sylvatica*, hornbeam *Carpinus Betulus*, holly *Ilex aquifolium*, field maple, perfoliate honeysuckle *Lonicera caprifolium*, sycamore *Acer pseudoplatanus*, privet *Ligustrum* sp., two semi mature silver birch trees *Betula pendula*, ivy *Hedera* sp., elder, willow, mature oak, fly honeysuckle *Lonicera xylosteum*, cotoneaster *Cotoneaster* sp., yew *Taxus baccata*, black briony *Dioscorea communis* and spindle. The understory is comprised of similar species as under H1 with cleavers, rough meadow grass, Timothy *Phleum pratense* and bugle *Ajuga reptans*.

3.2.5 The northern hedgerow (H3) stands at 1.8m high and is comprised of bramble, goat's willow, ornamental shrubs, cotoneaster, ash *Fraxinus excelsior*, privet, Japanese rose *Rosa rugosa*, hawthorn, blackthorn, spindle, wayfaring tree *Viburnum lantana*. The following plants form the understory: bugle, common nettle, rosebay willowherb *Chamerion angustifolium*, tufted hair grass *Deschampsia cespitosa* and cut-leaved-cranesbill *Geranium dissectum*.

Tall ruderal

3.2.6 Within the north-western corner of the Site is an area of tall ruderal (TN5) with mature crack willow *Salix fragilis*. The tall ruderal understorey of the crack willow includes; common nettle, creeping thistle *Cirsium arvense*, Yorkshire fog, cock's-foot, meadow buttercup, cleavers, Timothy, oak sapling, goat willow, bramble, creeping cinquefoil, cut-leaved-cranesbill and meadow foxtail.

Miscellaneous - Structures

3.2.7 The western boundary (TN2) of the Site is a bare barbed wire fence.

3.3 Protected Species Assessment

Bat Tree Assessment

3.3.1 There are mature and semi-mature trees along the southern and northern boundaries, however these trees all appeared to be in healthy condition, with no obvious features for day roosting bats.

Bat Habitat Assessment

3.3.2 Regarding the quality of habitat for commuting and foraging bats, the southern boundary provides connectivity to the wider landscape and to a small block of woodland some 46m west of the Site. The northern and eastern hedgerows also provide suitable linear features for commuting bats, however these boundaries are adjacent to either a residential dwelling or Church Lane. At the time of the survey the grassland was long (ca. 0.5m) and tussocky which is considered suitable habitat for foraging bats. The Site is connected to farmland and fields via hedgerows and treelines, however the Site is not directly connected to any larger areas of woodland. Overall, due to the relatively small size of the Site and lack of connectivity to optimal habitat such as large areas of woodland, the Site is likely to be used by low numbers of commuting and foraging bats and therefore has been assessed as having 'Low' suitability under the Bat Conservation Trust guidelines (Collins, 2016).

Dormice

3.3.3 The Site's hedgerows contain suitable food sources for foraging dormice and provide suitable habitat for commuting and nesting. The hedgerows also provide connectivity to the surrounding landscape.

Badger and Hedgehog

3.3.4 No evidence of badger, such as latrines, hair or holes were noted during the survey. The Site however provides suitable commuting and foraging habitat for the species. The hedgerows are also suitable for resting and commuting hedgehog, with the grassland providing suitable foraging habitat.

Breeding Birds

3.3.5 The trees and hedgerows provide good quality habitat for breeding birds. Bird species noted during the survey include robin *Erithacus rubecula*, tree sparrow *Passer montanus*, starling *Sturnus vulgaris,* jackdaw *Corvus monedula*, song thrush *Turdus philomelos*, great tit *Parus major* and raven *Corvus corax*.

3.4 Reptiles

3.4.1 The initial assessment of the Site identified that the tall tussocky grassland provided suitable habitat for sheltering, foraging and commuting reptiles such as slow worm *Anguis fragilis,* common lizard *Zootoca vivipara* and grass snake *Natrix helvetica*. As a result a reptile survey was completed in 2022. The full results are provided in Table 4. In summary a single species of reptile was recorded; grass snake. A peak

of one sub-adult grass snake was recorded. Additional records of single juvenile grass snake were also recorded. The sub-adult was recorded under a felt along the northern boundary on two occasions.

3.5 Amphibian Assessment - GCN Habitat Suitability Index (HSI) Survey

3.5.1 There are no onsite waterbodies, however there are six ponds within a 250m radius of the Site, with an additional 14 ponds within a 500m radius (see table 3 and Figure 3 for locations, distances from the Site and intervening terrestrial habitat of ponds within a 250m radius).

Table 5 - Summary of Ponds within 250m Radius of the Site

Pond	Distance & Direction	Intervening Terrestrial Habitat
P1	53m, W	No intervening habitat, P1 is on edge of adjacent field to the west
P2	71m, E	Church Lane, grassland and ditch
P3	150m, NE	Church Lane, managed grassland and field
P4	197m, N	Church Lane, managed grassland and field
P5	241m, NE	Lewes Road (B2124), Church Lane, managed grassland and field
P6	235m, SE	Church Lane, paddocks and fields

3.5.2 The nearest pond shown on the OS maps is some 53m west of the Site (P1). This pond has been viewed on several occasions during the season. It has been dry since the first site visit and remained dry during the majority of the reptile surveys. As a result no eDNA surveys of the pond were possible. Immediately after heavy rain in October 2022 the depression held shallow water but this appeared to drain away quickly. The HSI score for the pond is 0.43 which equates to Poor suitability.

3.5.3 Pond P3, which is some 141m north-east of the Site, is the nearest pond to the GCN Class Survey Licence Return record, which recorded GCN in 2016.

4.0 EVALUATION

4.1 The Site does not lie within or adjacent to any statutory designated areas. The Site falls within the SSSI IRZ Park Corner Heath SSSI. However, consultation is only required with Natural England if there is any discharge of water or liquid waste of more than 20m^3 / day to ground or surface water.

4.2 A Phase 1 Habitat Survey has been undertaken and no rare or nationally scarce botanical species or habitats were identified within the Site. However, this is based on a single site visit undertaken in May. The site is dominated by semi-improved grassland which has some species indicative of the grassland being less improved such as meadow vetchling, oxeye daisy and common knapweed. However, the grassland is dominated by creeping buttercup and clover which indicates the overall improvement which has occurred. The grassland is therefore considered to be of Site importance.

4.3 The other main habitat is the hedgerows which are present along the northern, southern and eastern boundaries. These are largely species rich although some ornamental species are present (see para 4.4 below). The northern hedgerow forms curtilage with the adjacent residential property. The hedgerows are of Site importance.

Invasive Species

4.4 The species Japanese rose was noted along the northern hedgerow. This plant is included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). This means it is an offence to plant or cause this species to grow in the wild. This hedgerow is a shared boundary with a residential dwelling, so likely the plant is growing within the associated gardens.

Reptiles

4.5 A single species of reptiles has been recorded, grass snake. A low population of this species has been recorded with a single sub-adult and single juvenile animals recorded. This scores 1 on the Key Reptile Site criteria and therefore the Site does not qualify as a Key Reptile Site. The presence of the grass snake population is of Site importance.

Amphibians

4.6 No ponds are present within the Site. The closest pond (P1) is some 53m to the west of the Site and has been dry during spring/summer 2022.

Bats

4.7 The Site provides 'Low; quality bat foraging and commuting habitat due to the size of the Site and lack of connectivity to larger areas of optimal habitat. The Site is likely to be used by a small number of foraging and commuting bats. Recommendations for any new planting to be native and species-rich have been provided under the National Planning Policy Framework (NPPF) in section 5.3 of this report and this will increase the suitability of the Site for foraging bats. Due to the size of the Site, no dedicated bat activity surveys are required. Guidance on artificial lighting is provided in Appendix 3 to minimise the impacts of the proposals on the local bat population.

Badger and Hedgehog

4.8 No signs of badger were recorded during the survey within the Site and no further surveys are required. The Site however is suitable for foraging and commuting badgers and evidence of badger was recorded near to pond P1 to the west of the Site. The Site is also suitable for hedgehog. The hedgerows and overgrown ornamental planting is suitable for sheltering hedgehogs, with the grassland providing suitable habitat for foraging and commuting.

Breeding Birds

4.9 The hedgerows provide suitable habitat for breeding birds. It is considered, based on the quality of the habitats present, that this would be for the more common widespread song birds that nest fairly low in scrub and hedgerows. The diversity of species would be of Site importance.

Table 6 – Evaluation of ecological features

Feature	Summary	Importance
Grassland	Semi-improved grassland not species rich but with some species indicative of limited recent improvement	Neighbourhood
Hedgerows	On 3 borders, north, east and south. Species rich although some non-native/ornamental species present	Site
Reptiles	Low population grass snake	Site
GCN	No ponds present within site. Nearest pond 53m to west was dry in 2022	Negligible
Other species including birds, badger and hedgehog	The hedgerows provide suitable habitat for breeding birds and hedgehog whilst evidence of badger has been recorded to the west of the Site.	Site

5.0 ECOLOGICAL IMPACT ASSESSMENT

5.1 An additional aim of this report is to provide an assessment of the impacts of the proposals on the ecological and biodiversity interest of the Site and to identify and design mitigation that could remove or reduce effects or to provide compensation. The general approach follows CIEEM's EcIA guidelines. These guidelines are web based and subject to review and updating and a summary is provided in Appendix 2.

5.2 The measures proposed in Table 7 aim to avoid, reduce and/or mitigate potential impacts arising from the either the construction or operation (long-term existence) of the proposed development. The purpose and objectives of the measures described in Table 7 are to:

1) Avoid any damage to the retained hedgerows to the north, south and east;
2) Reduce the loss of areas of grassland as far as possible;
3) Avoid the risk of killing or injury of protected species known or considered likely to be present;
4) Limit dust and noise pollution during construction activities;
5) Identifying measures such as the use of existing gaps in the hedgerow for access / egress during construction, which will result in the avoidance of potential impacts on dormice.

5.3 The National Planning Policy Framework (Ministry of Housing, Communities and Local Government, July 2021) sets out planning policies on the protection of biodiversity and geological conservation through the planning system. Section 15 of the NPPF states that planning policies and decisions should contribute to and enhance the natural and local environment by:

- safeguarding local wildlife-rich habitats and wider ecological networks including the hierarchy of international, national and locally designated sites, wildlife corridors and stepping stones and areas identified by national and local partnerships for enhancement;
- promoting the conservation, restoration and enhancement of priority habitats and ecological networks;
- minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

5.4 A detailed Landscape and Ecological Management Plan would be required as part of the detailed design of the scheme which would set out the long term management of the retained and created habitats.

Table 7 – Mitigation Strategy and Enhancements, Impact Assessment and Residual Effects

Ecological Feature and Impact	Effect without mitigation	Practical mitigation measures including working practices	Significance of effects of residual impacts after mitigation
On-site Habitats			
Construction Impacts			
<u>Direct habitat loss</u> The following habitat will be lost during Site clearance: • semi-improved grassland • tall ruderal • hedgerow (small section of H1) Loss of plant species diversity and habitat corridor function; loss of connectivity for bats and reptiles; reduction in foraging habitat for birds, reptiles and invertebrates	Moderate Adverse effect on habitat diversity significant at Site Level	The aim of the landscape and enhancement strategy is to maintain a diverse mix of habitats and the planting of more native species that will be chosen for their suitability for insects and nesting/foraging birds, mammals and reptile species. • Areas of retained grassland will be protected during the construction phase from incursions during the construction period by using Heras fencing. • Long term management of grassland habitats (not affected by the development works) will be adopted with full details included in documents for reserved matters. Details relating to reptile mitigation discussed below. • Planting of new hedgerow along western boundary and enhancing retained hedgerows with a diverse mix of native species. • Japanese rose should be removed from the Site's side of the hedgerow and any waste containing the plant material will need to be removed to a licensed landfill as controlled waste.	Minor positive effect significant at Site Level

Ecological Feature and Impact	Effect without mitigation	Practical mitigation measures including working practices	Significance of effects of residual impacts after mitigation
Habitat Disturbance Damage to existing hedgerow trees and shrubs, including compaction of roots.	Minor negative effect on habitat diversity significant at Site Level	All trees and areas and hedgerows to be retained will be protected during the construction period with the use of temporary demarcation fencing which meets British Standard BS 5837:2012. No excavation or storage of materials will be carried out within the fenced areas. All contractors must be informed of the purpose of the fencing through signage and site safety briefs.	Neutral effect on habitat diversity significant at Site Level
Operational Impacts			
Increase footfall of residents on newly planted and retained habitat areas Disturbance to conservation areas/protected species receptors Fly tipping of garden waste and the potential increase in garden escapees and nutrient enrichment. Increase pollution runoff from roads and gardens. Pollution/waste disposal in drainage ponds	Negative impact on habitats significant at Site Level	Long term management plan to create attractive wildflower grassland within the retained areas with defined management with rotational cutting to create a mix of short and long grassland. Long term management plan to cover management of retained hedgerows which are not part of curtilage to new houses, specifically along the eastern side. Management of the hedgerows on the Site side to be carried out on a rotational manner and allowed to incrementally increase in height by ca. 10cm at every cutting rotation (i.e. every three years). This will help avoid a trim line forming and the hedge becoming stressed and leggy. Hedges that are allowed to incrementally increase in height and width will be healthier and better for wildlife as well as being able to sequester more carbon dioxide. Cuts will be carried out using reciprocating cutters or circular saw hedge cutters. Road side of hedgerows likely to require more regular cutting.	Neutral impact on habitats significant at Site Level

Ecological Feature and Impact	Effect without mitigation	Practical mitigation measures including working practices	Significance of effects of residual impacts after mitigation
		Provide information packs to new homeowners on the ecological assets within the scheme and how they can be protected. Include in management company brief. Signage to be provided with fencing provided to deter unofficial access to pond areas.	
Reptiles			
Construction Impacts			
Potential for killing and injury of reptiles during the site clearance. Removal of potential reptile refuge areas not considered an issue as the refuge areas are limited to the base of the hedgerows which are to be retained.	Minor negative effect significant at Site Level	Implementation of a reptile mitigation strategy that will include the following proposals to avoid the killing and/or injury of reptiles and the retention and/or provision of sufficient terrestrial habitat and connectivity to ensure long term viability of the reptile populations. The following outline strategy will ensure habitat is created that is designed to sustain the local reptile population. Further details on mitigation, including timings, habitat management etc. will need to be included in a final strategy during the detailed design stage. • Only grass snake have been recorded, as a result no translocation will be undertaken, rather the Site will be subject to careful habitat manipulation during the reptile active period (i.e. not during hibernation) to encourage reptiles to move out of the developable area; • Enhancements will be made to the western boundary, where a new hedgerow is proposed that will connect the Site to the wider landscape and provide additional reptile habitat. The hedgerow will be planted onto a hedgebank which will create hibernation and foraging potential.	Minor positive effect significant at Site Level

Ecological Feature and Impact	Effect without mitigation	Practical mitigation measures including working practices	Significance of effects of residual impacts after mitigation
		• Once the habitat manipulation is complete, the construction area will be destructively searched using a 360° excavator supervised by the project ecologists. • The vegetation clearance, will be carried out under ecological supervision during March to October. • Any retained habitat will be protected from encroachment during the construction process with Heras fencing and the retained grassland maintained during the construction period. • Enhancement of retained areas for reptiles along the eastern boundary with the following features. a) Log piles will be constructed using logs with a maximum diameter of 200mm. Each log pile will be secured with stakes to prevent piles from collapsing and with wire to prevent removal or dismantling. Number and location to be included in detailed landscape design. b) Artificial hibernacula will be constructed to the specification shown in Appendix 4. A hole will be dug out either by hand or by a mini digger to a depth of 500mm and back filled with timber logs and dead wood to a height of 500mm above ground. The hibernaculum will then be covered and capped with a 50mm – 100mm layer of topsoil and seeded with native acid grassland seed mix. Logs will be exposed at ground level to maintain gaps for reptile access. The hibernacula will be approximately 1.5m wide by 2m long and will run along a north-east to south-east direction so there is a southerly facing slope to maximise basking habitat. The digging of the hibernacula will be supervised by the project ecologist. Number and location to be included in detailed landscape design.	

Ecological Feature and Impact	Effect without mitigation	Practical mitigation measures including working practices	Significance of effects of residual impacts after mitigation
Operational Impacts			
Disturbance to reptile enhancements by residents. Disturbance to retained habitats through inappropriate long-term habitat management. Management of retailed grassland and hedgerows to be sensitive to presence of both reptiles and amphibians.	Minor negative effect significant at Site Level	Include details of long-term habitat management within landscape documents which will then be included in management company contracts.	Neutral effect significant at Site Level
Amphibians			
Construction Impacts			
Potential for killing and injury of amphibians during the site clearance. The nearest pond is some 53m to the west of the western boundary of the Site. It has been dry in 2022. GCN are known to be present in ponds over 140m to the north. The site provides fairly poor quality terrestrial habitat for GCN.	Minor negative effect significant at Site Level	Prior to development, the pond at P1 will continue to be assessed for potential to support amphibians and if access permitted P2 will also be assessed. In the event that P1 holds water in spring 2023 beyond mid-April, eDNA surveys will be undertaken. In the event that P2 is suitable for GCN the site would qualify to be registered under the GCN Low Impact Licence (GLICL) criteria. Mitigation during the construction under the GLICL licence would include a destructive search of the works area and if necessary some exclusion fencing or boarding used for short periods of time to prevent animals moving into the site when there are open trenches. Otherwise Reasonable Avoidance Measures (RAMS) will be employed. This will include: • Site (Heras) fencing to be installed to prevent damage to terrestrial habitat beyond the development site. If a site compound for	Neutral effect significant at Site Level

Ecological Feature and Impact	Effect without mitigation	Practical mitigation measures including working practices	Significance of effects of residual impacts after mitigation
		machine storage or material storage is required this will need to be on hardstanding and not on any vegetated habitats. • All rubbish material, including spoil piles, brick, rubble and roofing materials to be placed directly into skips to be removed from site. Piles of bricks and other building materials can be used as shelter by amphibians if not stored correctly. The Site will need to be well organized and kept tidy with waste materials removed quickly so they are not left as potential refuge sites for small animals. Before removing any materials, which have been stored on the ground, the area should be carefully checked for animals. • Store building materials on pallets raised off the ground wherever possible; • Any trenches which are left open overnight during construction works should have planks of wood placed in them to provide an exit ramp for terrestrial animals which may fall into them. As a precaution each morning any ditches or holes will be checked by the site manager. Trenches should be checked for animals before they are infilled.	
Operational Impacts			
Potential for amphibians to fall into gully pots if used Disturbance to retained habitats through inappropriate long-term habitat management. Management of retailed grassland and hedgerows to be sensitive to presence of both reptiles and amphibians.	Minor negative effect significant at Site Level	Use Aco kerbs in combination with gully pots to reduce risk of amphibians falling into gully pots. Include details of long-term habitat management within landscape documents which will then be included in management company contracts.	Neutral effect significant at Site Level

Ecological Feature and Impact	Effect without mitigation	Practical mitigation measures including working practices	Significance of effects of residual impacts after mitigation
Bats			
Construction Impacts – none predicted			
Operational Impacts			
Increased artificial lighting represents a major potential negative impact on existing and newly created or enhanced habitats, field boundaries and hedgerows that provide habitat for foraging and commuting routes. Removal/interference of bat boxes positioned on new houses.	Major negative effect significant at Site Level	Design and implementation of a Sensitive Lighting Strategy. Full details to be included at the detailed design stage however key points of this strategy will include: • Minimise light spill along the boundaries of the Site. • Eliminate any bare bulbs and upward pointing lighting. • Minimise the spread of light by keeping new lights near to or below the horizontal. Flat cut-off lanterns are best. • Consider the height of lighting columns. Light at a low level generally reduces impact. • Use narrow spectrum bulbs to lower the range of species affected by lighting. Use light sources that emit minimal ultra-violet light and avoid the white and blue wavelengths of the light spectrum to avoid attracting lots of insects. • Lights should peak higher than 550nm or use glass lantern covers to filter UV light. White LED lights do not emit UV but have still been shown to disturb slow-flying bat species. Provide advice sheet for homeowners in regard to bat boxes which are chosen as maintenance free.	Neutral effect significant at Site Level

Ecological Feature and Impact	Effect without mitigation	Practical mitigation measures including working practices	Significance of effects of residual impacts after mitigation
Breeding birds			
Construction Impacts			
Vegetation removal could cause damage or destruction of actively used bird nests if undertaken during the bird nesting season (March through to end of August). Increase noise disturbance affecting the ability of birds to hold territory if disturbance takes place during breeding season.	Minor negative effect significant at Site Level	Sensitive timing of the small amount of hedgerow that may need to be cut back to avoid the bird breeding season (March-August inclusive). Where this is not possible any vegetation to be removed will be checked by an ecologist; where nests are present, works will need to be delayed until all chicks have fledged and the nest is no longer in use. Noise disturbance to be mitigated for by ensuring barriers to retained hedgerow habitat under guidance set out in relation to root protection. Sounds barriers not considered necessary due to the low conservation status of species likely to be affected. Regular management of the grassland fields to take place prior to the construction period to reduce the habitat becoming more suitable. Sensitive timing of clearance works to avoid the bird breeding season (March-August inclusive). The suitability of the Site will be maintained and enhanced for breeding birds through the retention of hedgerows and the provision of additional hedgerow planting that will include planting of native food plants for a range of bird species and invertebrates. Full details to be included at detailed design stage. Bird boxes are to be installed throughout the Site to increase nesting opportunities. Full details of this to be included at detailed design stage but can include:	Minor positive effect significant at the Site level.

Ecological Feature and Impact	Effect without mitigation	Practical mitigation measures including working practices	Significance of effects of residual impacts after mitigation
		• 3x Vivara Pro Wood Stone House Sparrow Nest Box that can be positioned at eaves height and built into the wall cavity of new houses on the northern side to avoid prevailing wind and rain. Locations to be confirmed at detailed design stage. • 4x Vivara Pro Woodstone Seville Bird Box and Vivara Pro Woodstone Barcelona open fronted bird boxes to be positioned within retained hedgerows. Locations to be confirmed at detailed design stage.	
Operational Impacts			
Increase disturbance from residents in areas not included as public open space.	Minor adverse effect significant at the Site Level	Clearly defined areas of retained hedgerows and information packs to be provided to householders.	Neutral effect significant at the Site Level
Dormice			
Construction Impacts			
Presence of dormice has been considered and access into the site has been designed to avoid loss of hedgerow habitat by utilising an existing gap in the hedgerow. The very edge of this existing gap may require management to ensure visibility splays.	No effect	Enhancements though additional planting of a species rich hedgerow to the west of the Site and sensitive management of the retained hedgerow along the eastern boundary. This will benefit small mammals including dormice. Included in these proposals will be additional food plants such as hazel, hawthorn and honeysuckle.	Minor positive effect at Site Level
Operational Impacts			
Potential increase in cat predation	Negligible effect	The area already supports plenty of residential properties with cats. The enhancements and additional planting will improve the hedgerows for dormice.	Minor positive effect at Site Level

Ecological Feature and Impact	Effect without mitigation	Practical mitigation measures including working practices	Significance of effects of residual impacts after mitigation
		Hedgerow management described above is sensitive to presence of dormice.	
Hedgehogs and Invertebrates			
Operational Impacts			
Restricted movement of hedgehogs through the landscape	Minor adverse effect	If any close board fencing is to be installed around the Site or gardens, 13cm x 13cm holes should be cut into the base of the fences to allow hedgehogs to move through the landscape. It is also recommended that one hedgehog nest box, such as the Hedgehog Nest Box or H7 Hogilo Hedgehog House is installed within the retained habitats.	Neutral effect at Site Level
Long term reduction in grassland habitats	Minor adverse effect	Where landscape planting is proposed throughout the gardens, it is recommended that a range of nectar-rich plants are provided. Flowering plants should be made available for as long as possible through the year by planting a combination of plants which flower during spring, summer and late summer. This would benefit local wildlife by providing more nest building opportunities and food sources for small mammals, birds and invertebrates. Species such as lavenders, heathers and honeysuckles are good nectar sources for bumblebees and other insects, and honeysuckle can also be used by birds to forage and nest in. Climbing plants can be included to soften visual impacts whilst enhancing biodiversity by attracting invertebrates, such as moths, and providing bird nesting opportunities. Species such as honeysuckle, ivy, clematis, jasmine, and single-flowered roses are all suitable.	Minor beneficial effect

5.0 CONCLUSIONS

5.1 An Ecological Impact Assessment has been undertaken of an area of land west of Church Lane, Laughton, East Sussex between May and October 2022. The proposals are for the redevelopment of the Site with up to four residential dwellings.

5.2 Detailed reptile surveys have resulted in one species, grass snake, being recorded in very low numbers. An outline mitigation strategy has been provided in relation to these species.

5.3 The potential for dormice, bats and GCN to be present have been considered during the Site surveys. The closest pond (P1) has been dry for the duration of the surveys and was found to score Poor on the Habitat Suitability Index for its potential to support GCN. Outline Reasonable Avoidance Measures (RAMS) have been provided and in the event that the second closest pond (P2) is found to be suitable to support GCN, mitigation is possible within the proposals and the development would fall within the criteria to be registered under the Natural England Low Impact GCN licence.

5.4 Regarding dormice, no habitat is to be lost to the proposals and habitat creation and retained habitat management suitable for dormice is to be provided within the scheme. No surveys for dormice and no licence would be required.

5.5 Recommendations have also been made for enhancing the Site for biodiversity in accordance with NPPF. These include generous native planting and the installation of bird boxes, hedgehog house and maintaining connectivity for hedgehog.

REFERENCES

Beebee, T. & Griffiths, R. 2000. *Amphibians and Reptiles.* Harper Collins Publishers, Hammersmith, London.

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

English Nature 2002. *Barn Owls on Site. A guide for developers and planners.* Peterborough.

Froglife. 1999. *Froglife Advice Sheet 10: reptile survey.* Froglife, London.

JNCC (Joint Nature Conservation Committee) 2004. *The Bat Workers Handbook.* JNCC, Peterborough.

JNCC (Joint Nature Conservation Committee) 2003. *Handbook for Phase I Habitat Survey. A technique for Environmental Audit.* JNCC, Peterborough.

Langton, T. E. S., Beckett, C. L., and Foster, J. P. 2001. *Great Crested Newt Conservation Handbook.* Froglife, Halesworth.

Natural England. 2022. *MAGIC website*. Available from: http://magic.defra.gov.uk/. May 2022.

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, Vol. 10, pp. 143-155.

Rose, F. 2006. *The Wild Flower Key*. Frederick Warne, London.

Stace, C. 2010. *New Flora of the British Isles 3rd Edition*. Cambridge University Press.

Table 4 - Reptile Survey Results

Visit no	Date	Initials	Species	Common lizard	Slow worm	Grass Snake	Adder	Weather conditions		Other findings
1	9/15/2022	EW	Male					Time	14:30	lots of field voles using felts
			Female					Temperature	18	
			Adult Unknown					Cloud cover %	20%	
			Sub					Rain	nil	
			Juv					Wind	BF1	
			TOTAL	**0**	**0**	**0**	**0**			
			PEAK	**0**	**0**	**0**	**0**			
2	9/21/2022	EW	Male					Time	10:10	GS under felt 12 along N boundary
			Female					Temperature	17	
			Adult Unknown					Cloud cover %	30%	
			Sub			1		Rain	nil	
			Juv					Wind	BF1	
			TOTAL	**0**	**0**	**1**	**0**			
			PEAK	**0**	**0**	**1**	**0**			
3	9/26/2022	EW	Male					Time	12:30	Sub GS under felt 12 and juv under felt 2
			Female					Temperature	15	
			Adult Unknown					Cloud cover %	50%	
			Sub			1		Rain	nil	
			Juv			1		Wind	BF3	
			TOTAL	**0**	**0**	**2**	**0**			
			PEAK	**0**	**0**	**1**	**0**			
4	30/09/2022	EW	Male					Time	14:00	Juv GS under felt 2, lots of field voles under felts
			Female					Temperature	16	
			Adult Unknown					Cloud cover %	60%	
			Sub					Rain	nil	
			Juv			1		Wind	BF3	
			TOTAL	**0**	**0**	**1**	**0**			
			PEAK	**0**	**0**	**0**	**0**			
5	06/10/2022	EW	Male					Time	16:20	Juv GS under felt 2
			Female					Temperature	17	
			Adult Unknown					Cloud cover %	40%	
			Sub					Rain	nil	
			Juv			1		Wind	BF2	
			TOTAL	**0**	**0**	**1**	**0**			
			PEAK	**0**	**0**	**0**	**0**			
6	11/10/2022	EW	Male					Time	11:15	No reptiles, but voles under some of the felts
			Female					Temperature	14	
			Adult Unknown					Cloud cover %	100%	
			Sub					Rain	nil	
			Juv					Wind	BF1	
			TOTAL	**0**	**0**	**0**	**0**			
			PEAK	**0**	**0**	**0**	**0**			
7	19/10/2022	EW	Male					Time	11:45	No reptiles recorded, 40% cloud but sunny over site.
			Female					Temperature	16	
			Adult Unknown					Cloud cover %	40%	
			Sub					Rain	0	
			Juv					Wind	1	
			TOTAL	**0**	**0**	**0**	**0**			
			PEAK	**0**	**0**	**0**	**0**			

CORYLUS ECOLOGY

Corylus Ecology Ltd, Unit A3 Speldhurst Business Park, Went Farm, Langton Road, Speldhurst, Kent TN3 0NR. Corylus Ecology is the trading name of Corylus Ecology Ltd registered in England, No 5005553, Registered Office: Henwood House, Henwood, Ashford, Kent TN24 8DH

Project: 22051 The Weald Laughton, East Sussex

Title: Phase 1 Habitat Survey Plan

date: 14/07/2022	drawing no: Figure 1
drawn: EW	checked: AW

Figure 2 - Annotated Photographs

Eastern boundary facing south, showing H1 and H2 and tussocky grassland, TN1

Southern boundary facing east, showing H2 with trees and tussocky grassland, TN1

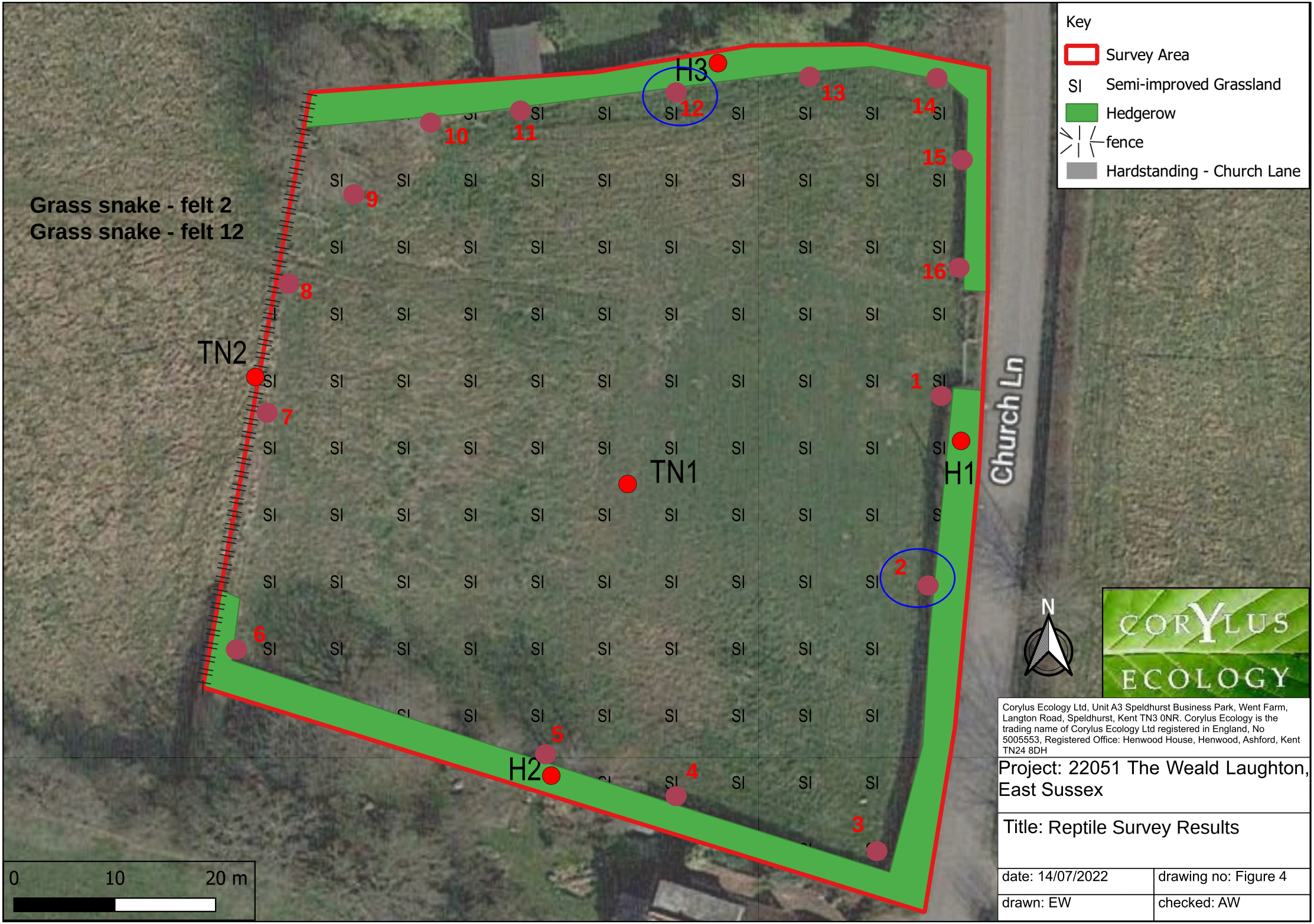
Western boundary facing north, showing post and wire fence along western boundary and northern hedgerow H3

Corylus Ecology Ltd, Unit A3 Speldhurst Business Park, Went Farm, Langton Road, Speldhurst, Kent TN3 0NR. Corylus Ecology is the trading name of Corylus Ecology Ltd registered in England, No 5005553, Registered Office: Henwood House, Henwood, Ashford, Kent TN24 8DH

Project: 22051 The Weald Laughton, East Sussex

Title: Ponds within 250m

date: 18/07/2022	drawing no: Figure 3
drawn: EW	checked: AW



CORYLUS ECOLOGY

Corylus Ecology Ltd, Unit A3 Speldhurst Business Park, Went Farm, Langton Road, Speldhurst, Kent TN3 0NR. Corylus Ecology is the trading name of Corylus Ecology Ltd registered in England, No 5005553, Registered Office: Henwood House, Henwood, Ashford, Kent TN24 8DH

Project: 22051 The Weald Laughton, East Sussex

Title: Reptile Survey Results

date: 14/07/2022	drawing no: Figure 4
drawn: EW	checked: AW

Appendix 1 – HSI Assessment

A1.1 The HIS Assessment involves examining ten "Factors" which are subsequently calculated and given a Suitability Index (SI). These ten factors are thought to affect GCN and include:

- Location (in Britain);
- Pond area;
- Desiccation rate (years out of ten that pond dries);
- Water quality;
- Percentage of pond shaded;
- Number of waterfowl;
- Fish population;
- Number of ponds within 1km;
- Terrestrial habitat quality; and
- Percentage macrophyte cover.

A1.2 Once each factor and accompanying suitability indices were ascertained, a simple geometric mean was calculated. The resulting figure, the HSI, is a value between 0.00 and 1. The resulting value is then used against the following categorical scale to establish the potential of encountering GCN:

- HSI value of <0.5 = Poor
- HSI value of 0.5 – 0.59 = Below Average
- HSI value of 0.6 – 0.69 = Average
- HSI value of 0.7 – 0.79 = Good
- HSI value of >0.8 = Excellent

Appendix 2 – Ecological Impact Assessment Criteria

The general approach follows the Guidelines for Ecological Impact Assessment in the UK and Ireland ("EcIA") produced by the Chartered Institute of Ecology and Environmental Management ("CIEEM") (Ref A1). These guidelines are web based and subject to review and updating. This ES is based on the guidelines available in February 2021. The guidance covers all stages of EcIA, including both evaluation and impact criteria. The criteria followed is summarised below:

Significance Criteria

The CIEEM EcIA guidance covers all stages of EcIA, including both evaluation and impact criteria. These guidelines set out that the emphasis in EcIA is on significant effects rather than all ecological effects. A significant effect being an effect that

- "*Either supports or undermines biodiversity objectives for important ecological features or for biodiversity in general.*
- *"Effects can be considered significant at a wide range of scales from international to local".*
- *"A significant effect is an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project."*

The main criteria used to assess the ecological value of habitats and communities are those described by Ratcliffe (1977) [ref A2] and the selection criteria for SSSIs produced by the Nature Conservancy Council (1989) [ref A3]. The primary criteria include rarity, typicalness, size, diversity, naturalness and fragility. Subsidiary criteria include ecological position, intrinsic appeal, potential value, and recorded history. The designation of SSSIs is not an all-inclusive list of sites which fall within the set criteria, rather the SSSI are designated as good examples of the better habitats within the region or nationally. Therefore, certain undesignated areas may fall within the criteria for being designated. Within individual counties there are often criteria for the selection of sites of County Importance within that specific County.

Further criteria used for assessing the ecological importance of a site may be based upon their value for particular species or assemblages of species. In addition to the individual species and groups the overall species and habitat assemblage or biodiversity is evaluated. Examples of valuation criteria related to a range of spatial scales are set out in Table 1 below.

Value	Examples of Valuation Criteria
International	An internationally designated site or candidate site (SPA, SAC, etc);
National	A nationally designated site (SSSIs, National Nature Reserves (NNRs); Species or habitats which fulfil the JNCC SSSI selection criteria,
Regional	Viable areas of key habitat identified in the regional BAP or smaller areas of such habitat which are essential to maintain the viability of a larger whole; Sites which exceed the County-level designations but fall short of SSSI selection guidelines where these occur;
County	County sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation including Local Nature Reserves (LNR) selected on County criteria;
Local (including District)	Areas of habitat identified as being of Local Value in the relevant Natural Area profile; LNR not selected on County criteria;
Parish/ Neighbourhood	Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or Neighbourhood e.g. species-rich hedgerows;
Within the zone of influence or Site Importance	This may be the project site or a larger area;
Negligible	Sites or areas which support few or no habitats, communities or species populations of nature conservation interest. Typical of such areas are most intensively managed silage fields and arable crops.

Table 1: Assessment of the Value of Ecological Resource

Biodiversity has been given a number of definitions but, insofar as it relates to EIA, it is generally considered as including both structural relationships (spatial linkage, fragmentation, aspect, dispersion etc.) and functional relationships (nutrient cycling rates, energy flow rates, metapopulation dynamics, etc.).

Assessment of Effects

Activities which may affect the ecological resource need to be identified first. The associated changes and the implications for the ecological resource then need to be assessed. The following factors must be considered when assessing the effects:

- Confidence in predictions;

- Magnitude of effect;
- Extent of effect;
- Duration;
- Reversibility; and
- Timing and frequency.

A level of confidence is required in assessing effects, the standard for which is given below. The requirement for the lowest confidence level, given below as "extremely unlikely", is for those effects which, although considered as extremely unlikely to occur, would have very serious consequences and would merit contingency planning.

- Certain/near certain;
- Probable;
- Unlikely; and
- Extremely unlikely.

Table 2 lists the broad categories used to assist in identifying the nature and types of different ecological effects. In addition to individual effects on the ecological resource being identified and evaluated, the cumulative effect of two or more effects on the resource is also evaluated using the same terminology.

Category	Example
Direct Effects	• habitat loss or destruction (for example, through construction work); • habitat fragmentation / severance; and • disturbance
Indirect Effects	• reduced population viability (for example, due to decrease in habitat area etc.); and • habitat isolation
Associated Effects	• ecological effects caused by actions linked with the Proposed Development
Cumulative Effects	• overall reduction in habitat diversity; and • ongoing habitat loss or fragmentation

Table 2: Categories of Ecological Effects (based on Treweek 1999 (ref A4)

The magnitude or physical extent of predicted effects upon an ecological feature is presented, wherever possible, in quantifiable terms. For example, the area of land taken, percentage of habitat lost or the

number of communities, species or individuals affected. Magnitude also considers the context of the feature affected within the categories of relative importance described above. For example, if there is an internationally designated site, the significance of predicted effects are assessed within an international context with reference to the relevant legislation.

The potential effects of development schemes on nature conservation can be either beneficial or adverse. Neutral/Negligible effects are also recognised.

In the CIEEM guidance an ecologically significant effect is defined as an effect on the integrity of a defined site or ecosystem and/or conservation status of habitats or species within a given geographical area. The value of any feature that will be significantly affected is then used to identify the geographical scale at which the effect is significant. This value therefore relates directly to the consequences in terms of legislation, policy or development control at the appropriate level. Significant effects on features of ecological importance should be mitigated (or compensated for) in accordance with guidance derived from policies applied at the scale relevant to the value of the feature or resource. Any significant effects remaining after mitigation (the residual effects), together with an assessment of the likelihood of success in mitigation are the factors to be considered against legislation, policy and development control in determining the application

References

A1 Chartered Institute of Ecology and Environmental Management (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater and Coastal*. www.cieem.org.uk

A2 Ratcliffe, D (1977) *A Nature Conservation Review.* Cambridge University Press.

A3 Nature Conservancy Council (1989) Selection Criteria for Sites of Special Scientific Interest. Peterborough

A4 Treweek, J (1999) Ecological Impact Assessment

Appendix 3 - Technical Guidance on Artificial Lighting and Bats

From: Institute of Lighting Professionals (ILP) and Bat Conservation Trust (BCT). 2018. *Guidance Note 8: Bats and Artificial Lighting.*

Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following should be considered when choosing luminaires:

- All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used.
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (ideally <2700 Kelvin) should be adopted to reduce blue light component.
- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012).
- Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill.
- Low level or bollard lighting can often cause unacceptable glare, poor illumination efficiency, a high upward light component and poor facial recognition. Therefore the use of specialist bollard or low-level downward directional luminaires should only be considered if their use is directed by a lighting professional.
- The height of columns should be carefully considered to minimise light spill.
- Only luminaires with an upward light ratio of 0% and with good optical control should be used – See ILP Guidance for the Reduction of Obtrusive Light.
- Luminaires should always be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting should be set on motion-sensors and short (1 minute) timers.
- As a last resort to minimise, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.

Appendix 4

Reptile Log Pile and Hibernacula Specification

Log piles –Each log pile should be secured with stakes to prevent piles from collapsing, and also secured with wire to prevent removal or dismantling. These log piles will create summer refuge.

Hibernacula – Hibernacula will be built largely above the ground but dug in to a depth of up to 500mm and back filled with a mix of clean rubble, timber logs and dead wood to a height of up to 500mm above ground. The hibernacula will be covered with a terram membrane and capped with a 50mm – 100mm layer of soil and seeded with wildflower grass seed mix mentioned below. Rubble and logs will be exposed at ground level to maintain gaps for reptile access. The hibernacula can either be dug out by hand or by a minidigger.

The hibernacula will be 1.5m wide by 2m long and will run along an east-west direction so there is a southerly facing slope to maximise basking habitat.

Hibernaculum on impermeable ground

Where ground conditions are impermeable, then an 'above-ground' or mounded design should be utilised in order to prevent the hibernaculum from flooding. This design should also be used if it is not possible to excavate a pit for any other reason.