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Preliminary Ecological Appraisal Report

Land north of Trethewey Farm Cottages
Germoe
TR20 9AU

October 2022

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QUALITY CONTROL		
The information which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct.		
Prepared by	Sophie Higgins Senior Ecologist BSC (Hons), MSC, ACIEEM	21st June 2022
Reviewed by	Olatz Gartzia Senior Ecologist BSC (Hons), MSC, ACIEEM	23rd June 2022
This report remains valid for 12 months from date of issue. Survey data are valid for 12-18 months from the date the survey was undertaken.		

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

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

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

1. EXECUTIVE SUMMARY

1.1. Darwin Ecology Ltd was commissioned by Laurence Associates to undertake a Preliminary Ecological Appraisal (PEA) at Land north of Trethewey Farm Cottages, Germoe, TR20 9AU. The survey was required to inform two separate planning applications. One application is for an agricultural building/garage with the other application for a single static caravan.

1.2. The PEA comprised recording the habitat types present within the site, including features of interest for protected or notable species. A desk study was also conducted to identify protected or notable sites, habitats or species (both within the site or local vicinity), which could potentially be affected by the proposals.

1.3. The site itself comprises of bare ground, ephemeral/short perennial vegetation and tall ruderals bounded by species poor Cornish hedges, which are a key ecological feature of the site.

1.4. The habitats within the site are of low ecological value.

1.5. The proposals will result in the loss of tall ruderals, bare ground and ephemeral/short perennial vegetation as well as earth mounds and rubble piles. The removal of these habitats has the potential to harm hibernating reptiles and hedgehogs.

1.6. Precautionary measures have been recommended to reduce any risk of injury/killing of reptiles and hedgehogs during the removal of earth and rubble piles.

1.7. There is opportunity for enhancement within the application site for reptiles, hedgehogs and invertebrates.

2. INTRODUCTION AND BACKGROUND

2.1. Darwin Ecology Ltd was commissioned by Laurance Associates to undertake a Preliminary Ecological Appraisal (PEA) at Land north of Trethewey Farm Cottages, Germoe, TR20 9AU. The survey was required to inform two separate planning applications. One application is for an agricultural building/garage with the other application for a single static caravan.

2.2. The surveys and report follow the Chartered Institute for Ecological and Environmental Management (CIEEM) Guidelines for Preliminary Ecological Appraisal (2017), which sets out the approach for PEAs to provide a rapid assessment of the ecological features present, or potentially present, within a site and its surrounding area.

2.3. The proposals on which this assessment is based are shown in **Appendix 1.**

Site Overview

2.4. The site itself comprises of the southern and south-eastern corner of two semi-improved grassland fields. The site comprises of areas of bare ground, tall ruderal, ephemeral/short perennial vegetation and rubble and earth piles bounded by species poor Cornish hedges. An access track is present to the south of the site which is in use for access to the fields and the existing barn.

2.5. The immediate areas comprise semi-improved grassland fields with arable fields to the west and north-east of the site (Figure 1).

2.6. The wider landscape is a mixture of arable, improved and semi-improved grassland bounded by Cornish hedges (Figure 2).

Figure 1: Site location within the local landscape (Copyright Ordnance Survey Leisure Maps, 2021)

Figure 2: Site location within the wider landscape (Copyright Ordnance Survey Leisure Maps, 2021)

3. LEGISLATION & POLICY

General Wildlife Legislation

3.1. Wildlife in the United Kingdom (UK) is protected through European and national legislation, supported by national and local policy and guidance. Development can contribute to conservation and enhancement goals outlined by these various legislation and policy by retaining and protecting the most valuable ecological features within a site and incorporating enhancements to provide biodiversity net gain.

3.2. This section provides a brief summary of the principle legalisation and policy that triggers the requirement for PEA in the UK. The presence of protected species within a site are a material consideration during the planning process. PEAs (and any necessary further assessments) provide an ecological baseline for a site and evaluation of the potential impact of proposals.

3.3. It is the responsibility of those involved with development works to ensure that the relevant legislation is complied with at every stage of a project. Such legislation applies even in the absence of related planning conditions or projects outside the scope of the usual planning process (i.e. permitted development projects or projects requiring Listed Building Consent only).

Relevant Legislation

3.4. The principal pieces of legislation relating to wildlife and of relevance to this report are:

1. *EU Habitats Directive (1992);*
2. *EU Birds Directive (1979);*
3. *Conservation of Habitats and Species (Amendment) Regulations 2017;*
4. *The Wildlife and Countryside Act 1981 (as amended);*
5. *The Natural Environment and Rural Communities Act 2006;* and
6. *The Protection of Badgers Act 1992* (extended under *The Hunting Act 2004*).

3.5. The above legislation aims to protect sites and species and give detailed descriptions of exactly how these features are protected and what actions would constitute an offence.

National Planning Policy

3.1. The *National Planning Policy Framework (2021)* aims to minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity.

3.2. Chapter 15 'Conserving and enhancing the natural environment' details what local planning policies should seek to consider with regard to planning applications.

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

> *174 a)* Protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
>
> *174 b)* Recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
>
> *174 d)* Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
>
> *175)* Plans should: distinguish between the hierarchy of international, national and local designated sites; allocate land with the lease environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries;
>
> *176)* Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural beauty which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and Broads. The scale and extent of development within all these designated areas should be limited, while development within their settings should be sensitively located and designed to avoid or minimize adverse impacts on the designated area.

3.4. Specific policies regarding habitats and biodiversity comprise:

> *179)* To protect and enhance biodiversity and geodiversity, plans should:
>
> > *a)* identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation and

> *b)* promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species and identify and pursue opportunities for securing measurable net gains for biodiversity.

180) When determining planning applications, local planning authorities should apply the following principles:

> *a)* if significant harm to biodiversity resulting from a development cannot be avoid (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
>
> *b)* development on land within or outside of Sites of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the feature of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
>
> *c)* development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
>
> *d)* development whose primary objective is to conserved or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around development should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

3.5. *Circular 06/05: Biodiversity and Geological Conservation* provides guidance on the application of the law relating to planning and nature conservation and complements the *National Planning Policy Framework*.

3.6. *Biodiversity 2020: A strategy for England's wildlife and ecosystem services* provides the *UK Biodiversity Action Plan* and country level biodiversity strategies for England, based on the list of habitats and species listed on *Section 41* of the *Natural Environment and Rural Communities Act 2006*. These are considered the habitats and species of principal importance requiring conservation action.

4. METHODOLOGY

Desk Study

4.1. A desk study was undertaken for designated sites, protected or notable species, and habitat records within a 2 km of the site. The following resources were consulted:

- The MagicMap website provided information regarding statuary designated site of nature consideration interest within 5 km of the site, details of European Protected Species (EPS) license issued for bats within 2 km, and details of EPS licences for dormice within 1 km of the site;
- A data search requested from the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS) for a 1 km radius of the site;
- A search of the Cornwall Council Planning Portal for relevant planning applications within the last two years was conducted to find any relevant reporting within the local area; and
- Google Maps and the Ordnance Survey (OS) leisure map were used to view aerial photographs and maps, and to assess the ecological context of the site within the wider landscape.

Extended Phase 1 Habitat Survey

4.2. Senior Ecologist Sophie Higgins ACIEEM conducted a walkover survey on 14th July 2022.

4.3. The PEA survey assessed habitats present within the application red line boundary for their potential to support protected species, including:

- Bats;
- Common amphibians;
- Reptiles;
- Dormice (*Muscardinus avellanarius*);
- Otters (*Lutra lutra*) and water voles (*Arvicola amphibious*);
- Other terrestrial mammals, including hedgehogs and badgers (*Meles meles*);
- Breeding birds; and
- Invertebrates.

4.4. The site was also searched for non-native, invasive plant species, with particular care to search for the most commonly occurring and problematic species, such as Japanese knotweed (*Fallopia japonica*), Indian balsam (*Impatiens grandiflora*) and giant hogweed (*Heracleum mentegasianum*).

Limitations

4.5. Ecological surveys are limited by factors that affect the presence of plants and animals such as the time of the year, weather, migration patterns. The survey was undertaken in June and therefore represents a valid sample of ecological evidence present on that date/ season. The report is not designed, nor is it required to present a completed inventory of flora/fauna.

4.6. The absence of desk study records is not relied upon to determine absence of a particular species or habitat. Often, the absence of records is a result of under-recording within the given areas.

4.7. This report remains valid for 2 years from the date of the survey, however, a walkover survey within this period may be required to demonstrate whether or not the habitats have remained as described.

Quality Assurance

4.8. The surveys and assessments have been overseen by and the report checked and verified by a member of CIEEM, whom is bound by its code of professional conduct. All surveys and assessments have been undertaken with reference to the recommendations given in the British Standard BS 42020, and as stated within specialist guidance, as appropriate.

5. SURVEY RESULTS

Desk Study

Statutory and non-statutory Designated Sites

5.1. There are two statutory sites designated for biological (rather than geological) interest within a 2km radius of the site comprising of Trepanning Hill Species Site of Scientific Interest and Special Area of Conservation (SAC).

5.2. In addition, a single non-statutory designated site, Trepanning County Wildlife Site (CWS) lies within a 1km radius of the site.

5.3. Further details can be found in **Table 1** below.

Table 1: Statutory and non-statutory designated sites

Designated Sites	Name and Designation Type	Reason for Designation	Approximate Distance from Site
Within Site Boundaries	There are no sites designated for biodiversity within the site boundaries		
Statutory designated sites within a 2km of the Site	Tregonning Hill SSSI /SAC	This site supports western lowland heath dominated by heather. The site supports extremely rare liverwort Western Rustwort (*Marsupella profound*).	1.03km north-east
Non-Statutory designated sites within a 1km of the Site	Trepanning Hill CWS	This site forms part of the above SSSI and SAC site.	983m north-east of the site.

SSSI Impact Risk Zone

5.4. The site lies within the impact risk zone for the above SSSI sites. The proposals for a static caravan and agricultural building/garage do not come under the criteria listed and therefore the Local Planning Authority are not required to consult with statutory bodies for this application.

Priority Habitats and Ancient Woodland

5.5. There are no priority habitats within the site. Areas of lowland heathland lie 902m north-east of the site. Small areas of deciduous woodland lie in the immediate area.

5.6. There are no ancient woodlands within a 1km radius of the site.

Extended Phase 1 Habitat Survey

Habitats

5.7. The site comprises of bare ground with areas of ephemeral/short perennial vegetation and tall ruderals bounded by species poor Cornish hedges. These habitats are described below and shown in Figure 3.

Bare ground

5.8. Areas of bare ground are present within the site. Earth ground is the dominant species with occasional common nettle (*Urtica dioica*) and ribwort plantain (*Plantago lanceolata*).

5.9. Bare ground is of no ecological value.

Ephemeral/short perennial

5.10. Areas of ephemeral/short perennial vegetation is present throughout the site especially in the south-eastern corner of Field 1. Species present include red campions (*Silene dioica*), common chickweed (*Stellaria media*), nettle, field bindweed (*Convolvulus arvensis*), perennial sow thistle (*Sonchus arvensis*), doves foot cranes bill (*Geranium molle*), broad leaved dock (*Rumex obtusifolius*), bramble (*Rubus fruticosus agg.*), spear thistle (*Cirsium vulgare*), ragwort (*Senecio jacobaea*), creeping buttercup (*Ranunculus repens*), curled dock (*Rumex crispus*), selfheal (*Prunella vulgaris*) and broad-leaved willow herb (*Epilobium montanum*).

Tall Ruderals

5.11. Areas of tall ruderal vegetation are present at the base of the Cornish hedges. These areas are dominated by bracken (*Pteridium aquilinum*) with occasional common nettle.

Cornish hedge

5.12. Species poor Cornish hedges bound the fields and access track. Blackthorn (*Prunus spinosa*) is the dominant species with occasional bramble. Other species present include red campions, navelwort (*Umbilicus rupestris*), polypody (*Polypodium vulgare*), wood sage (*Teucrium scorodonia*), bracken, lady fern (*Athyrium filix-femina*), cleavers (*Galium aparine*), harts tongue fern (*Phyllitis scolopendrium*), cocks foot (*Dactylis glomerata*) and hogweed (*Heracleum sphondylium*).

5.13. Cornish hedges are of County Value and area. Local Biodiversity Action Plan (LBAP) habitat.

5.14. The proposals will retain the Cornish hedges on site.

Photo 1: Bare ground habitat

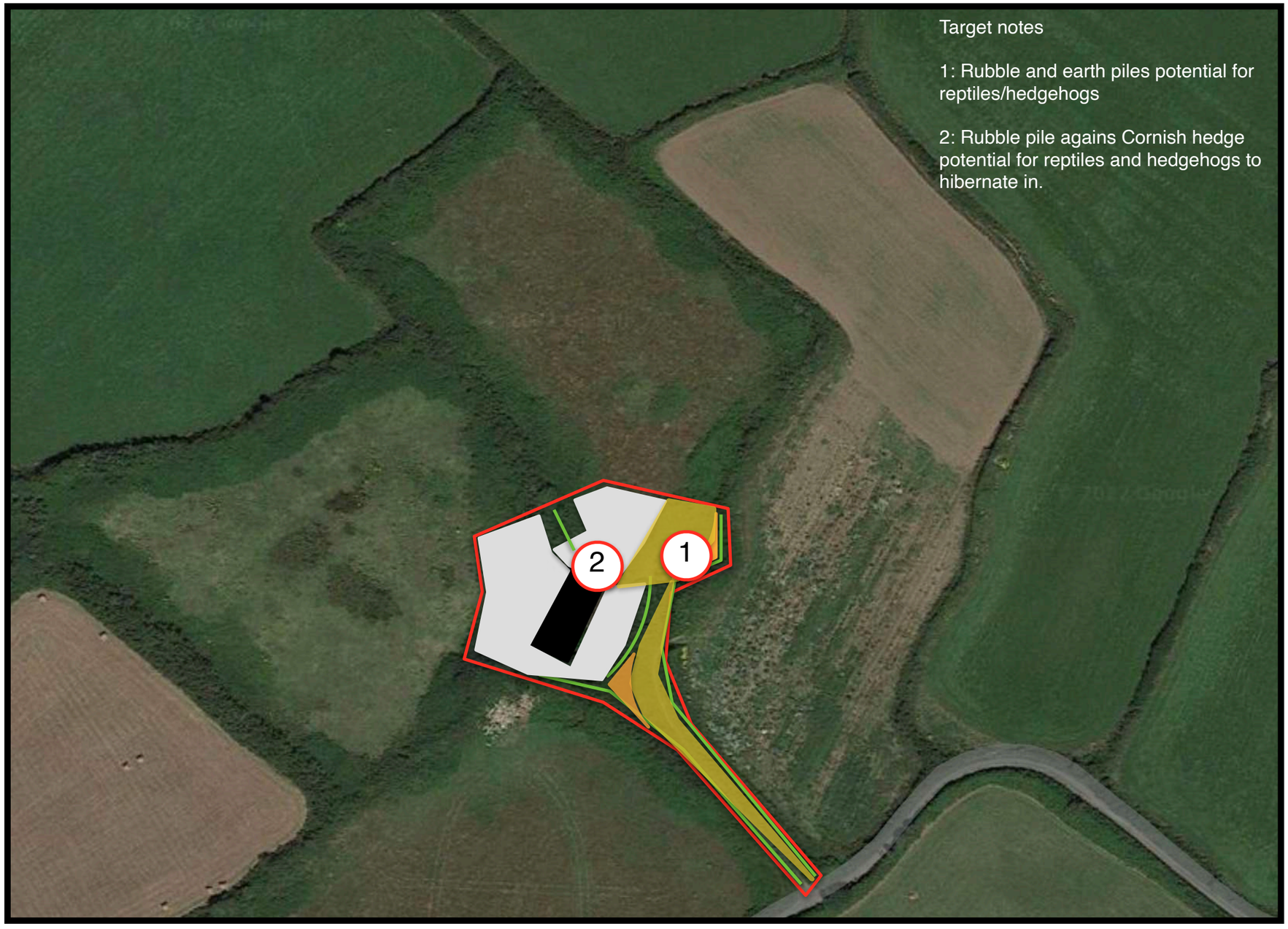
Photo 2: Bare ground and ephemeral/short perennial

Photo 3: Tall ruderals and Cornish hedge.

Photo 4: Cornish hedge

Photo 5: Earth mound with ephemeral/ short perennial vegetation.

Photo 6: Rubble piles with ephemeral/ short perennial vegetation.



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

Site boundary

Species poor Cornish Hedge

Bare ground

Ephemeral/short perennial vegetation

Tall ruder vegetation

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Extended Phase 1 Habitat Map

Date : 21.06.22

Protected Species

Bats

5.15. There are are no EPS licences within a 1km radius of the site. However several are present greater than a kilometre from the site.

5.16. Only three records for a pipistrelle species and a single brown long-eaed were retuned from the data search. Records where from 2001-2011, with no records on site.

5.17. The Cornish hedges bounding the site provide suitable foraging and commuting habitat for bats, although it lacks a mature linear feature which bats prefer to forage along.

5.18. Bats survey's carried out by Plan for Ecology in 2020 of the barn which was confirmed to not support roosting bats. The existing barn is not within the red line boundary however it lies just to the south of the site.

5.19. There are no structures within the areas to be affected and no mature trees with bat roosting potential.

5.20. The proposals will retain the existing Cornish hedges with no direct impacts.

5.21. The proposals to provide a static caravan and a agricultural building/garage will result in the increase in lighting at the site and therefore a suitable lighting strategy is required to reduce any impacts on foraging and commuting bats.

Common Amphibians

5.22. Two records for common toad (*Bufo bufo),* two records of common frog (*Rana temporary*) and two palmate newt (*Lissotriton Helvetic's*) were returned in the data search. Records were from 450m south-east of the site.

5.23. There are no waterbodies within the site to support breeding amphibians. The site currently lacks optimal habitat for amphibians however they are likely to be using the Cornish hedges and tall ruderals areas as terrestrial habitat when moving between sites. The remainder of the fields provide optimal habitat for amphibians in the form semi-improved grassland.

5.24. If the works result in the loss of semi-improved grassland within the wider fields, then impacts on reptiles could occur. However, the plans are to retain the remainder of the fields with no impacts.

5.25. Nonetheless, the removal of areas of tall ruder vegetation has the potential to injury/kill common amphibians during their terrestrial phase.

Reptiles

5.26. A single record for slow worm (*Anguis fragilis*) was returned in the data search. The record was from 350m north of the site. A single grass snake (*Natrix Helvetica)* record was recorded 450m south-east of the site.

5.27. The site provides no supporting habitat for reptiles. The Cornish hedges are likely used as foraging and commuting habitat for reptiles moving between sites.

5.28. The remainder of the fields provide optimal habitat for reptiles however, this habitat will be retained with no impacts.

5.29. The log and earth piles within the bare ground provide suitable hibernation habitat for reptiles.

5.30. The loss of rubble and earth piles could result in the injury/killing of common reptile species.

Dormice

5.31. There are no EPS licences for dormice within a 1km radius of the site.

5.32. The site provides sub-optimal habitat for dormice in the form of species poor Cornish hedges.

5.33. During the survey the dormice nests were found within the site. The site does not directly link to larger areas of woodland and therefore dormice are considered absent from the site.

5.34. Dormice are excluded from further discussion.

Badgers

5.35. Two records of badger were returned in the data search. Both records were from near the church to the south-west of the site.

5.36. There are no badger setts or evidence of badgers within the site. However, an old disused badger sett was identified to the west of the site along the Cornish hedges. The sett has three holes which have several rabbit droppings outside and no recently dug earth mounds.

5.37. Badgers are likely to move through the site.

5.38. As badgers are a highly mobile species, the disturbance of a badger sett cannot be ruled out.

Other Mammals

5.39. Two records for hedgehog (*Erinaceus europaeus*) and a single otter record (*Lutra lutra*) were returned in the data search.

5.40. The site is likely to support hedgehogs. The loss of rubble/earth mounds could result in the injury/killing of hedgehogs, if present during the hibernation period.

5.41. There are no watercourse within the site to support otters, therefore they are considered absent from the site.

Breeding Birds

5.42. Several bird records were returned in the desk study with wood warbler (*Phylloscopus sibilatrix*) being a notable one.

5.43. During the sit visit magpies (*Pica pica*) were recorded within the site. The Cornish hedges are likely to support birds which are commonly found within farmland settings.

5.44. The proposals will not result in the loss of any Cornish hedges however as the works are close to the hedges, there is potential for disturbance to nesting birds during the nesting season.

Invertebrates

5.45. The site is dominated by bare ground and is unlikely to support notable species.

Non-native plant species

5.46. There were no non-native invasive plant species recorded during the survey.

6. DISCUSSION AND RECOMMENDATIONS

Sensitive Receptors/Ecological Important Features

6.1. The following habitats and species have been evaluated as being subject to potential adverse effects in the absence of mitigation:

- Cornish species poor hedges
- Bats

Designated Sites, Priority Habitats and Ancient Woodland

Potential Impacts

6.2. The proposals will not directly impact on any statutory designated sites within the area. However, the site lies close to Tregonning Hill Special Area of Conservation (SAC) which could result in the recreational increase of people using this site. However, this SAC does not have a confirmed zone of influence and due to the number of other open spaces such as Praa Sands Beach nearby, the increase in two people residing at this site is unlikely to have a significant impact on this SAC site.

Habitats

6.3. The habitats on site are of low ecological value with the Cornish hedges being the key ecological feature of the site. The proposals will retain the boundary hedges however, works will be carried out in close range to the hedges.

6.4. It is recommend that Cornish hedges are fenced at their base to protect the hedge from any damage during construction works. The fence should be a minimum of a 1m from the base.

6.5. The log and earth piles on site should be dismantled by hand to ensure that no reptiles or hedgehogs are using these areas for hibernation. Works to removed these should be undertaken prior to the hibernation period between October-March inclusive.

Bats

6.6. The boundary features provide suitable foraging and commuting habitat for bats. Although there will be no loss of hedges on site, lighting could spill onto these features and disturb foraging bats.

6.7. Mitigation is recommended in the form of a sensitive lighting scheme during the construction and operational phases of the development. The lighting scheme would include the direction of any lighting away from boundary features. Guidance by the International Lighting Professionals and the Bat Conservation Trust (2018), discusses the following mitigation options that would be recommended along the boundaries of the site:

- Any external lighting/security lighting should be set on motion sensors and short 1 minute timers.

- Luminaries should always be mounted on the horizontal, I.e. no upward tilt.
- LED luminaries should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- Buffers, hoods or louvres can be used to reduce light spill and direct it only to where it is needed (Appendix 2 for further details).

Badgers

6.8. No current active badger setts were identified within the site boundary however, former badger setts now used by rabbits were found along the western boundary of the Field 2. Badgers are highly mobile and could create new setts on site prior to the works commencing.

6.9. It is recommended that an updated walkover of the site is undertaken immediately prior to the start of works to check for any active badger setts. If a sett is identified on site, then works may require a badger licence.

Hedgehogs

6.10. The removal of rubble and earth piles within the site could injury/kill hedgehogs during hibernation. It is recommended that the removal of any hedges/hedgerows are undertaken outside of the hedgehog hibernation period (March-October, inclusive).

Breeding Birds

6.11. Although there will be no loss of Cornish hedges, works are in very close range to the hedges which could disturb nesting birds. It is recommended that initial development works are undertaken outside of the usual breeding bird season (normally taken to be March-August inclusive). If this time scale is cannot be accommodated, a check for nesting birds will be undertaken by a suitably qualified ecologist. Any active nests should be identified and protected subject to the relevant legal provisions until the all nesting attempts are complete.

7. ENHANCEMENT RECOMMENDATIONS

7.1. National planning policy states that all developments should seek to enhance onsite biodiversity whether impacts on protected species are recorded or not. Incorporating enhancement features into new or renovated buildings, and landscaping proposals, should be carefully considered. These features can be simple and inexpensive, please see below for specific recommendations.

Bat and Bird Boxes

7.2. There is potential to include some bird and bat boxes within the mature trees in the remainder of the site to increase roosting and nesting opportunities for bats and birds.

Grassland Management

7.3. The easiest and most appropriate way to maintain and enhance the ecological value of the site is via appropriate management practices.

7.4. Regular management of the grassland areas should comprise an annual hay cut to 10 - 15 cm in September with removal of the arisings. An additional cut in early spring (February to March) can be undertaken if required, to continue to control the dominance of taller grasses and remove nutrients as the diversity of wildflowers continue to develop.

7.5. More regular mowing of pathways can be conducted, although this should be undertaken with hand tools such as hand streamers or brush cutters to protect wildlife that may be using the longer swards. Similarly, taller ruderal vegetation at the site margins can be cut annually between October and February if required, using a hand strimmer or brush cutter. Cutting approximately half of the this type of vegetation in alternate years ensures that a suitable refuge for wildlife is retained throughout the year.

Wildlife Beneficial Landscaping Scheme

7.6. Any future landscape planting should seek to enhance biodiversity, improve connectivity to the surrounding habitats and provide food and shelter for a wide range of wildlife. All amenity planting and formally landscaped areas should be designed using a variety of plant species beneficial for wildlife. These do not necessarily have to be native but should be chosen for their ability to provide nectar or fruit and should be non-invasive species. There are a number of specialist seed mixes available specific to certain soil types, growing conditions and designed to benefit different groups of species such as bees or butterflies and moths.

7.7. All habitats should be managed in a suitable way to encourage a wide variety of insects and other wildlife to use the site.

Reptile and Amphibian Habitat

7.8. To provide new resting and hibernating habitat for reptile and amphibians, small deadwood piles or hibernaculum features can be incorporated at appropriate areas of the site (see Deadwood Piles and Hibernacula in Appendix 3).

Hedgehog Habitat

7.9. Appropriate hedgehog features, including specifically designed hedgehog houses, can be created at suitable locations within the site (see Hedgehogs in Appendix 4).

Invertebrate Features

7.10. Habitats within the site can best be enhanced through appropriate management practices, although specific features can be incorporated at the application site and wider ownership area, if desired (see Invertebrates in Appendix 5).

7.11. The main aim of management for invertebrates is to maintain a diverse structure, with areas of short sward, bare ground, tussocks and flowering herbaceous plants. Native plants should be allowed to set seed to increase the availability of food (nectar and pollen) for foraging insects.

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APPENDIX 1 PROPOSED PLANS

PROPOSED SITE PLAN (3)
1:200

0 1m 5m 10m

N

Key:

- Hedge/screen planting.
- Proposed lawns.
- Proposed decorative planting.
- Proposed medium height shrub planting.
- Existing trees.
- Proposed trees.
- Proposed parking spaces.
- Existing Cornish Hedges
- Proposed Cornish Hedges
- Proposed gravelled areas.
- Proposed foul drains.
- Proposed storm drains.
- Proposed rainwater soak-aways
- Existing walls.
- Proposed walls.

Notes:

Rev.	Description	Drawn	Date

planning | architecture | landscape

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CONSTRUCTION OF AGRICULTURAL BUILDING AND DOMESTIC GARAGE.

Project Address:
OCEAN VIEW BAARN,
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TR20 9QU

Client:
DAVE & STELLA ELLIOTT

Drawing Title:
PROPOSED SITE PLAN

Scale:	Drawn:
1:200@A1	BC
Date:	Checked:
09/22	BC

Drawing No: 22033-PL-00-11
Rev:

PLANNING

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APPENDIX 2: BATS AND LIGHTING

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Bats & Lighting

THE IMPACT OF LIGHTING ON BATS

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

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

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

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

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

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

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

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

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Bats & Lighting

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

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

What lighting should I use?

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

What to avoid:

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

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

Key Points

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

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

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APPENDIX 3 REPTILE FEATURES

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Deadwood Habitat Piles

Design and creation

Deadwood habitat piles offer valuable habitats for an array of saprophytic (deadwood eating) invertebrates that will in turn provide food for a wide range of predatory species of insects, birds, mammals, reptiles and amphibians.

On sites where vegetation structure is limited, brash and log piles provide an instant enhancement, Deadwood habitat piles also provide shelter and refuge opportunities for larger animals, particularly reptiles and amphibians.

They can also be suitable hibernation sites during the winter for reptiles, amphibians and small mammals including hedgehogs. Think bonfire!

Habitat piles should be located in sunny or part shaded sites. A compact central core, with larger woody material in contact with the ground is recommended to provide the damp and decomposing wood conditions that are most suitable for benefiting saprophytic invertebrates. The outer layers should be laid more loosely on top. This provides a diverse structure within the habitat pile and provides suitable cover and basking opportunities for reptiles.

Habitat piles should be maintained by adding material every few years as the pile decomposes and do not require much management.

To provide optimal conditions for reptiles, amphibians and mammals, log piles should contain a mixture of sizes and shapes with plenty of small diameter material included. This introduces voids of different sizes and creates a complex internal structure.

They can be created to be an attractive feature of the landscape where a more formal appearance is required.

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APPENDIX 4 HEDGEHOG FEATURES

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Provisions for Hedgehogs

Hedgehogs

Hedgehogs are listed as a Priority Species for Conservation Action under the UK Biodiversity Action Plan, and protected from harm in the UK under Schedule 6 of the Wildlife and Countryside Act 1981.

Under the NERC Act 2006, the hedgehog is categorised as a 'Species of Principal Importance' for biodiversity. Evidence suggests that the number of hedgehogs present within the UK has been in decline since 1995 (Peoples Trust for Endangered Species PTES)

To ensure that hedgehogs are continually able to forage within or commute through gardens or areas of suitable habitat wildlife gaps should be installed within any fence lines or walls. These should measure 13cm x 13cm, which will allow hedgehogs to move through, but will be too small for pets and can be created easily.

Features such as brash piles can be created easily using arisings from your garden / site, which will provide foraging resources and a suitable nesting habitat.

Precautions should be undertaken during construction works to protect hedgehogs from harm including installing barrier fencing, covering trenches or excavations overnight, installing a ramp in any excavations that cannot be covered and checking all excavations / trenches before proceeding with the works the following day.

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APPENDIX 5 INVERTEBRATE FEATURES

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Insect boxes and bug hotels

Invertebrates

The provision of insect boxes and bug hotels provide a valuable resource for invertebrates, providing suitable nesting habitat for important native pollinators such as mason bees and leafcutter bees. They can also provide opportunities for a wide range of species to shelter and over-winter during the colder months.

Bug hotels are highly adaptable, and are therefore suitable for almost all developments and habitats. They can be made easily from a range of waste and plant materials, and more specialist items such as bee bricks can be purchased in order to target specific species.

Image: RSPB

Bug Hotel

These are easily implemented in almost any situation as bug hotels can be made from a range of materials, such as bricks, plant pots, tree cuttings, logs and broken tiles.

Bug hotels can also be adapted to benefit specific species, such as bees, woodlice, and ladybirds.

Other terrestrial species such as hedgehogs, reptiles and amphibians can also benefit from sheltering in a bug hotel.

Insect boxes

A range of prefabricated insect boxes such as the Green & Black Bee Brick (left) and the Woodstone Insect Box (above) are available and can be incorporated into or onto buildings or on trees to provide nesting habitats for a range of solitary bee species.

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Designing Landscaping for Invertebrates

Invertebrates

Woodland pockets including standing deadwood and log piles can provide benefits for saproxylic invertebrates and woodland floor species, as well as providing an additional resource for pollinators through incorporation of a variety of wild flowers.


Image: C. Nash


Image: C. Nash

Creation of **ephemeral wet areas** can have substantial benefits, as many species associated with brownfield sites are dependent upon sources of standing water, within which predatory species such as fish are not present or able to persist.

Sand bank pocket features in landscaping can provide benefits for ground-nesting bees, wasps and other thermophilic insects by providing nesting, hunting and basking opportunities in proximity to foraging habitat.


Image: C. Nash


Image: C. Nash

Inclusion of r**ubble, metal (via sculptures if desirable) and ornamental planting** can benefit ground beetles that rest under rocks and species that require basking areas. Ornamental planting can also be beneficial for pollinators providing they are not double flowered and produce pollen and nectar.

These features do not need to be large, with mosaics of smaller but frequent features within landscaping likely to provide the most value for invertebrates.

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