PRELIMINARY ECOLOGICAL APPRAISAL

BUENA VISTA, FOXES LANE, MENDHAM, HARLESTON, IP20 0PF

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CONTENTS Page. No

1. Executive Summary **3**

2. Introduction **7**

2.1. Purpose of Survey 7
2.2. Site Location 8
2.3. Site Description 8
2.4. Proposed Works 8
2.5. Scope of Survey 8
2.6. Legal Framework 10

3. Methods **10**

3.1. Desk Study 10
3.2. Phase 1 Site Survey 10
3.3. Protected Species Survey Methodology 11
3.4. Impact Assessment Methodology 14
3.5. Legislation 16

4. Limitations **18**

5. Desk Study Results **19**

5.1. Designated sites 19
5.2. Notable species 21

6. Results of Phase 1 Habitat Survey **22**

6.1. Habitats and Vegetation 22
6.2. Protected Species Potential 24
6.3. Preliminary Building and Tree Roost Assessment 25
6.4. Great Crested Newt Assessment 27

7. Evaluation and Recommendations **30**

7.1. Designated Sites 30
7.2. Habitats and Vegetation 30
7.3. Protected and Notable Species 31

8. Avoidance and Mitigation **37**

9. Biodiversity Enhancement **41**

10. Ecological Condiitons and Further Surveys **43**

11. References **44**

Appendix 1- **Site Location and Proposal Plans**
Appendix 2- **Photographs**
Appendix 3- **Wildlife Legislation and Desk Study Information**
Appendix 4- **Great Crested Newt eDNA test certificate**

1.0 Non-Technical Summary

The following summary is an extract of the report. Please ensure the report is read in its entirety for detailed survey findings and recommendations:

Eco-Check were commissioned in June 2022 to undertake a Preliminary Ecological Appraisal (PEA) at Buena Vista, Foxes Lane, Mendham, Suffolk, IP20 0PF to update a previous survey in September 2019. A planning application has been submitted to Mid-Suffolk District Council for the demolition of two agricultural buildings and construction of 2 detached dwellings, garages, gardens and a shared access.

The site and adjacent boundaries comprised a mosaic of habitats including arable land, buildings, broad-leaved scattered trees, hedging, improved grassland, standing water (pond) and tall ruderal vegetation. The ecological value of the construction zone is assessed as being of local value (low) only, the pond, mature trees and hedging are of moderate (parish) ecological value.

There were no statutory designated sites within the development site or within 2km of the development site. There is one Roadside Nature Reserve and two County Wildlife Sites within 2km of the development site. These are Turkey Hall Meadow CWS-102 and Mill Lane CWS-103, situated approximately 505m and 1,050m south-east respectively from the development site.

Protected species of note within the search area include great crested newt, seven species of bat, brown hare, hedgehog, grass snake, water vole and numerous protected and 'Amber & Red List bird species'. No records for protected or BAP species were found within the application site itself.

Based on the habitat types present and species records, it is considered that the site has potential to support the following protected species or groups of species: invertebrates (common and widespread species), breeding/nesting birds, terrestrial mammals, foraging/commuting/roosting bats, amphibians, reptiles and water vole. The site lacks suitable habitat for otter, hazel dormouse and white clawed-crayfish and great crested newt (See eDNA tests of ponds).

In the absence of mitigation, the proposed development would give rise to a moderate adverse impact on breeding/nesting birds, a moderate-minor on terrestrial mammals and a minor-adverse neutral impact on habitats, amphibians, invertebrates and foraging/commuting bats. The impact of the development on nearby statutory designated sites is considered to be neutral as there are no designated sites within a 2km radius. The impact on non-statutory sites, namely County Wildlife Sites (CWS), is considered also to be neutral on account of the separation distance, from site with no direct access from public rights of way and so no increase in recreational disturbance.

Mitigation has been proposed which would reduce the overall impact to minor adverse-neutral, including:

- Avoidance: Maintaining the short grassland on site through regular mowing, creation of artificial refugia/hibernaculum along the edge habitats of the site; retention of pond, mature trees and hedging; timing of vegetation clearance and ground works to avoid the bird nesting season 1st March to 15th September inclusive; ensure a minimum 5m buffer zone is maintained along the hedges and pond margins; trenches and excavations to be covered at night or a mammal ramp provided; no trees to be removed without a detailed bat roost assessment (PRA) being undertaken; no groundworks or plant machinery within the RPA's of trees; building materials to be stored off the ground on pallets; sensitive lighting design in accordance with Bat Conservation Guidelines (2018); measures to be taken to avoid killing/injuring of terrestrial mammals.

- Mitigation: Landscape planting to include native fruit and berry bearing trees, hedging, shrubs and plants which provide a nectar source to improve foraging resources for a range of invertebrate and bird species.

- Enhancement: Erection of bird and bat boxes, installation of insect hotels. Enhancement and management of boundary hedgerows to increase value to wildlife.

The expected residual impact with implementation of the above mitigation would be **minor adverse** upon breeding/nesting birds, foraging/commuting bats, common invertebrates and terrestrial mammals. The impact on habitats, reptiles, amphibians (including great crested newt), water vole, hazel dormouse, otter and white clawed-crayfish is considered to be **neutral.** The following advisory recommendations include:

- Destruction of in-use nests or harm to adult birds caused by removal of trees/hedgerows on site during the main breeding bird season (1st March to 31st August). If works commence during this period a nesting bird survey must first be undertaken by a suitably qualified ecologist (SQE).

- Preliminary Tree Roost Assessment (PRA)- If any of the trees identified as having bat roost potential (T1-T3) will be impacted upon, i.e. where trees will be removed, root protection zones cannot be adhered to, or management is recommended by the appointed arborist, a Detailed Elevated Tree Roost Assessment of the trees must be undertaken.

- Great Crested Newt Survey- The preliminary survey identified pond P1 and P2 as having average potential to support a population of great crested newts, an eDNA survey of P1 was carried out in 2020 by Greenlight ecology, returning a negative result confirming an absence of GCN populations within the ponds. As the pond, boundary trees and hedges are the principle valuable habitats it is recommended that these are retained and protected for the duration of the development works.

- An Ecological Constraints and Opportunities Plan (ECOP) would highlight the boundary habitats as a moderate (and ultimately replaceable) constraint on development. Before the start of construction, it is recommended that in line with the British Standard 42020:2013 Biodiversity – Code of practice for planning and development - that a Construction Environment Management Plan (CEMP) is submitted and approved. The role of the CEMP is to ensure that the identified risks to biodiversity are assessed and that suitable methods are adopted on site to minimise the risks through the production of a method statement. The CEMP is also to ensure that biodiversity protection zones are enforced.

This report aims to establish an ecological baseline, identifying protected habitats and species that may be affected as a result of the proposed works. It aims to establish if further surveys are required and where possible make recommendations for design options that avoid significant effects on important ecological features and resources. The survey and assessment were completed by independent, qualified and experienced ecologists.

It is assumed for the purpose of this assessment that there will be no loss of any mature trees, hedgerows or disturbance to the pond or pond margins and that the key valuable boundary habitats are retained and protected during the proposed development. We suggest that any habitat loss associated with the proposal can be adequately mitigated through landscaping, planting and other biodiversity enhancement measures and biodiversity off-set using the wider site area under the ownership of the applicant.

Table 1.0 – Executive summary

Protected Species / Habitat	Findings	Potential Effect	Recommended Mitigation, Enhancements & Further survey requirements.
Statutory Protected Site (SSSI, RAMSAR etc…)	NA	NA.	None
Non-statutory Protected Sites (RSPB, LWS etc…)	Roadside Nature Reserve (RNR), 1km north, Turkey Hall Meadow CWS-102 and Mill Lane CWS-103, situated approximately 505m and 1,050m south-east respectively from the development site.	Neutral- No public right of access to the CWS and not within impacting distance of site.	Green infrastructure provisions within site.

Protected Species / Habitat	Findings	Potential Effect	Recommended Mitigation, Enhancements & Further survey requirements.
Protected/ Priority Habitats	Hedgerows are a UK BAP habitat.	Loss of hedging	Plant a new double row staggered hedgerow along the east and south boundary of the new gardens adjacent the arable fields and linked to existing hedgerows.
Amphibians (Including Great Crested Newt)	There are 7 records of great crested newt (*Triturus cristatus*) within 2km (2005-2014), nearest record approximately 1.4km south-east. There is a large pond in the south-west corner of the site with good potential (0.71) and a further 6 within c.250m eDNA tests of the on-site pond P1 and adjacent moat P2 in 2020 returned negative results for GCN.	Ground works causing disturbance to great crested newt. Loss of suitable terrestrial habitat.	The habitats within and bordering the site are considered as of moderate value for newts, and some hedging and ditch may serve as connecting habitats between the proposed development site and further suitable habitats for GCN to the north. Construction zone buildings/short grassland unlikely to support GCN. Proposed habitat management to maximise value to GCN and other amphibians. Protect the boundary habitats to avoid direct disturbance to GCN.
Badgers	No evidence found on site. Adjacent woodland and pasture fields provide suitable habitat	Ground works causing disturbance to badger setts etc.	Precautionary approach to ground works adjacent to hedges/tree lines etc. Pre-works site check before clearance.

Bats	Negligible/Low roost potential within the hedgerow trees in the application site. 2 x mature willow trees on edge of pond (T2-T3) and a mature poplar (T1) with cracks, splits and knot holes with moderate roost potential. Habitats of "Medium/High" suitability for foraging and commuting bats within and adjacent to site.	No predicted impacts subject to retaining mature trees bordering the pond margins. Loss of roosts if present. No evidence of roosting bats from preliminary roost assessment of buildings B1 & B2. Artificial lighting could preclude bats from foraging along the site's boundaries.	Prior to any arboricultural works a detailed tree roost assessment to be undertaken. Artificial lighting should be kept to the minimum required for safety. Use of anti-pollution LED bollard lighting and avoid floodlights and security lights where possible. Use of timers and PIR/motion activated lights were suitable.
Birds	Trees, hedging and buildings provide nesting habitat and pigeon nests noted in building B1	Loss of breeding and nesting habitat. Disturbance to birds during works. Loss of foraging habitat within site.	Additional native planting to provide nesting opportunities. Works to avoid bird nesting season 1st March to 15th September. Nesting bird check by SQE if clearance works commence during this period.
Dormice	Habitats of marginal suitability.	No predicted impacts	None
Otters and White-clawed Crayfish.	No records and no evidence of presence and no suitable habitat.	No predicted impacts.	None.
Water Vole	One record of water vole (*Arvicola amphibious)* from 2014. The on-site pond has steep densely vegetated banks and with abundant riparian vegetation which would provide suitable habitat for water voles.	Disturbance during demolition, clearance and construction works.	Fence off the pond and pond margins during development to prevent disturbance to the pond margins and riparian vegetation.
Reptiles	There are two records of grass snake *Natrix natrix* within 2km of the site. The site is dominated by short mown grassland and buildings which is of low value for reptiles.	Habitat loss. Risk of injuring / killing reptiles during development works.	Sensitive clearance of site under the recommendations within a CEMP. Reptile avoidance and mitigation measures as proposed in Section 7.0 to be adhered to.

2. INTRODUCTION

2.1. Purpose of Survey

Eco-Check were commissioned in June 2022 to undertake a Preliminary Ecological Appraisal (PEA) at Buena Vista, Foxes Lane, Mendham, Suffolk, IP20 0PF. A planning application has been submitted to Mid-Suffolk District Council for the demolition of two agricultural buildings and construction of 2 detached dwellings, garages, gardens and a shared access. A preliminary ecological appraisal was undertaken on 10th June 2022. To provide information to support the ecological assessment, a preliminary bat roost assessment of the buildings and trees was also undertaken and assessment of any ponds within 250m of the site (access permitting).

This survey aims to highlight any evidence of (or potential for) protected species or habitats that could result in a constraint to the proposed development. The assessment follows guidelines produced by the Chartered Institute of Ecology and Environmental Management (CIEEM 2017) and to British Standard 42020:2013 (BSI, 2013). This report provides recommendations for enhancement of the site for biodiversity in line with the National Planning Policy Framework (NPPF) (Department of Communities and Local Government, 2018) and best practice guidelines. To provide information to support the ecological assessment, a bat scoping survey of the trees has also been undertaken.

2.2. Site Location

The site is situated approximately 2km south-east of the village civil parish of Mendham and 1km north-west of Metfield within the Mid-Suffolk District. The site is located to the south of Foxes Lane between Hollow Lane to the west and Sandpit Hill to the east. The site comprises two redundant agricultural buildings, short mown improved amenity grassland, scattered trees, tall ruderal vegetation, hedging and trees and a large pond (P1) in the south-west corner. The surrounding land use is predominantly large open arable fields to the east and south, horse paddocks to the west and residential barns, gardens and woodland to the north. The soil in this area is mainly sandy clay loam underlaid by sandy clay. Ph 6.5-7 alkaline. Free draining. (**See Fig.1**).

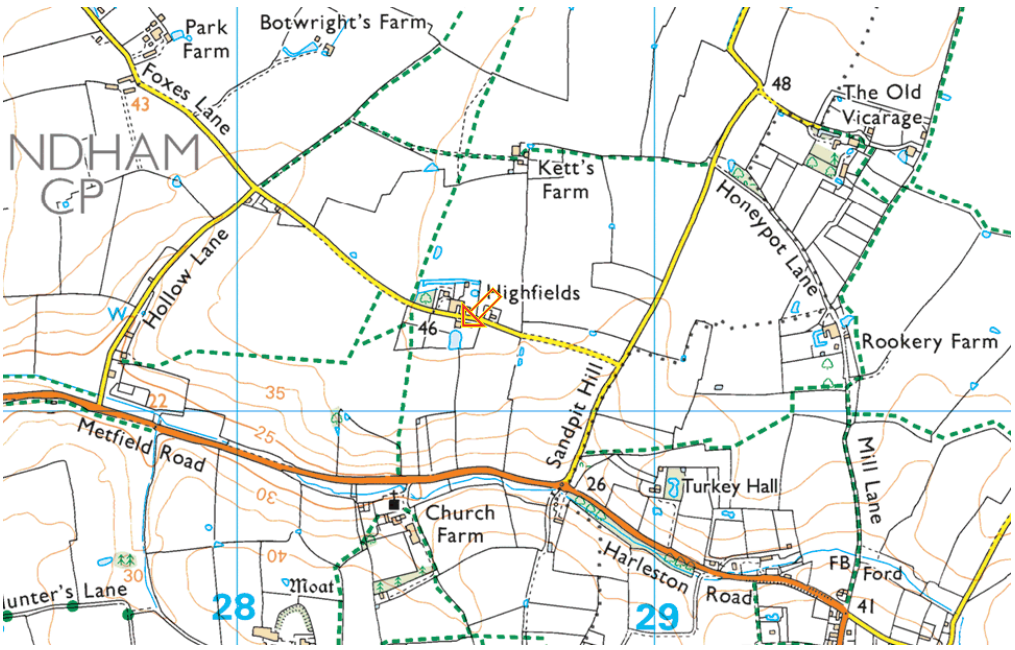

Figure 1.0- Site Location Map- Streetmap 2019

2.3. Site Description

The application site is roughly square and measures approximately 70m by 70m at its extents and covers an area of approximately 0.5ha but with only the north half of the site covering 0.2ha being developed and mostly within the existing building footprint.

The site was formerly used for agricultural purposes although the buildings are now only used for storage. The site comprises arable land, short improved grassland, buildings, pond and associated aquatics and some tall ruderal vegetation. There is hedging and trees along part of the south boundary and the length of the west boundary. The extent of the survey area is shown in **Appendix 1**.

2.4. Proposed Works

The proposed works include the clearance and leveling of the site area, creating a shared internal access to serve all of the dwellings and construction of 3 detached dwellings with gardens to the west side. A new fence/hedge line will be created along the boundaries of the development site and additional tree and shrub planting. An existing site layout and proposal plan has been included in Appendix 1.

2.5. Scope of Survey

The ecological investigations undertaken include:

1. A desk study to gather existing information on statutory and non-statutory sites of conservation interest, and any protected or notable species.

2. A survey to describe the vegetation and habitats of ecological importance utilizing the Handbook for Phase 1 Habitat Survey, (JNCC, 2010) and the National Vegetation Classification methodology as set out in the NVC Handbook (source: *"Handbook for using the National Vegetation Classification"* J.S.Rodwell, 2006 Joint Nature Conservation Committee).

3. A reconnaissance survey for evidence of protected species and identification of habitats suitable for such species. In particular the survey adopted the national survey methodologies for badgers, birds, reptiles, amphibians and bats.

4. Analysis of the data gathered from desk and field surveys and identification of any likely significant effects on protected species, including proposals for avoidance, reduction, compensation and enhancement measures.

5. Assessing the magnitude and nature of any impact the existing and proposed land use would make on the site, evaluate any residual effects of the land use and recommendations for further investigations where necessary.

The assessment aims to:

• Describe the baseline condition of the ecological features within the site;

• Assess the potential construction and operational impacts resulting from biophysical changes incurred by the land use;

• Identify the mitigations necessary to reduce the potential impact of the land use on designated sites, habitats, protected and notable species (i.e. ecological features) which occur within the site), and;

• Summarise the residual impacts of the land use on the ecology and nature conservation in the zone of influence.

The impact assessment presented in this report was undertaken in compliance with the Chartered Institute of Ecology and Environmental Management *Preliminary Ecological Appraisal* (CIEEM, 2017). Comments on the ecological value of the site as a wildlife resource and the significance of the change of land use follow the guidelines provided by Regini (2000).

2.6. Legal Framework

The principal European and UK legislation relating to biodiversity and nature conservation relevant to the proposed development are:

- Conservation of Species and Habitats Regulations (2017)
- The EC Directive on the Conservation of Wild Birds (791409/EEC).
- The Wildlife & Countryside Act (1981) and subsequent amendments.
- The CROW Act 2000, particularly Section 74 habitats and species.
- The Protection of Badgers Act (1992).

The UK government is committed to a significant reduction of the current rate of biodiversity loss by 2030. This commitment is recognised in:

- The England Biodiversity Strategy
- Biodiversity 2030: A Strategy for England's Wildlife
- National Planning Policy Framework (Replacement of PPS9);
- BS 42020:2013- Code of Practice for Planning and Development

3. METHODS

3.1. Desk Study

A desk study for statutory and non-statutory wildlife sites and protected and priority species was undertaken using the Magic website and records supplied by Suffolk Biodiversity Information Service (SBIS), 1:25000 scale maps and local satellite imagery was also reviewed prior to the field survey to identify features of potential interest including ponds, woodland, meadows and adjacent high-quality habitat.

The potential for protected rare and/or priority species to be on site has been assessed considering the nature of the site and the habitat requirement of the species in question. Absence of records does not constitute absence of a species. Habitats on-site may be suitable to support other protected/priority species that have not previously been recorded within the search area.

SBIS does not allow detailed species records to be made publicly available, such as direct inclusion within this report, and so a records summary is provided. Species recorded have been taken into consideration for our impact assessment, however any accurate locations are determined to be sensitive and cannot be revealed.

3.2. Phase 1 Site Survey

The survey was undertaken on 10th June 2022 by James Hodson of Eco-Check Ltd, an experienced ecological consultant with a BSc (Hons) in Environmental Sciences and MSc in Environmental Impact Assessment and licensed to undertake bat surveys and to disturb bats under Natural England Level 2 Bat Survey License 2017-30927-CLS-CLS and great crested newts 2018-36283-CLS-CLS.

The vegetation and habitat types within the site were noted during the survey in accordance with the categories specified for a Phase 1 Vegetation and Habitat Survey (JNCC, 2010). Dominant plant species were recorded for each habitat present.

The site was inspected for evidence of and its potential to support protected or notable species, especially those listed under the *Conservation of Habitats and Species (Amendment) Regulations 2017,* the *Wildlife & Countryside Act 1981* (as amended), including those given extra protection under the *Natural Environment and Rural Communities (NERC) Act 2006* and *Countryside & Rights of Way (CRoW) Act 2000*, and listed on the UK and local Biodiversity Action Plans. Such species include amphibians, reptiles, bats, badgers, birds, dormice and water voles. Evidence of badgers was searched for throughout the site, including setts, footprints, feeding signs, hairs and droppings.

The site was searched for evidence of invasive plant species, such as Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*), giant hogweed (*Heracleum mantegazzianum*), horizontal/wall cotoneaster (*Cotoneaster horizontalis*) and floating pennywort (*Hydrocotyle ranunculoides)*.

As the attributes of the site and its potential for protected, notable and invasive species may change over time, this report is broadly considered valid for a duration of two years, after which time it is recommended that an update site assessment is undertaken. In some cases, protected or invasive species' use of a site may change over a shorter timescale, for instance the use of a badger sett by badgers, which may change month to month. In such cases, appropriate precautionary advice or recommendations for update surveys are given within this report.

3.3 Protected and Key Species Survey

Amphibians (Including Great Crested Newts)

Any ponds, lakes, reservoirs or other water bodies on site, or within 250M (with good habitat connectivity) were assessed for their potential to support breeding populations of amphibians, specifically Great Crested Newts. Assessing potential suitability for Great Crested Newt is undertaken using the Habitat Suitability Index (HSI), a geometric mean of ten habitat suitability criteria (see table 2.0) (Oldham *et al.* 2000). The resulting HSI score should be interpreted as either; Excellent (>0.8), Good (0.7 – 0.79), Average (0.6 – 0.69), Below Average (0.5 – 0.59) potential for supporting Great Crested Newts (Oldham *et al.* 2000)

Table 1.0 – Habitat suitability criteria used to calculate (HSI), the suitability of a pond to support Great Crested Newts (based on Oldham *et al.* 2000)

Indices	Name:	Description:
SI_1	Geographic Location	Lowland England or upland England, Scotland and Wales
SI_2	Pond area	To the nearest 50m²
SI_3	Permanence	Number of years pond dry out of ten
SI_4	Water quality	Measured by invertebrate diversity
SI_5	Shade	Percentage shading of pond edge at least 1m from shore
SI_6	Fowl	Level of waterfowl use
SI_7	Fish	Level of fish population
SI_8	Pond count	Number of ponds within 1km divided by 3.14
SI_9	Terrestrial habitat	Quality of surrounding terrestrial habitat
SI_{10}	Macrophytes	Percentage extent of macrophyte cover

Badgers

A visual assessment for setts, latrines, prints and evidence of foraging activity was undertaken within the site boundaries.

Bats

A Preliminary Roost Assessment (PRA) was undertaken in accordance with methods outlined in the Bat Conservation Trusts “Bat Surveys for Professional Ecologists” (Collins, 2016) Including both a desk-based and field-based assessment. Details of these guidelines can be found in table 2.0.

Table 2.0 – Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape (Adapted from table 4.1 pp. 35 in Collins, 2016)

Suitability.	Description of Roosting habitats.	Description of Commuting and Foraging habitats.
Negligible	Negligible habitat features on-site likely to be used by roosting bats.	Negligible habitat features on-site likely to be used by commuting or foraging bats.
Low	A structure 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, 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 tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Medium	A structure 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 unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High .	A structure 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, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree- lined watercourses and grazed parkland. Site is close to and connected to known roosts.

Birds

On-site habitats were assessed for their potential to support breeding (nesting) birds. All bird species observed during the two field surveys as well as the reptile survey visits were recorded. Birds observed were categorized based on both their RSPB and BAP status.

Dormice

An initial inspection for evidence of Dormice or habitats that could support Dormice was undertaken.

Invertebrates

Specific sampling for invertebrates falls outside of the remit of a Preliminary Ecological Assessment. However, any invertebrates observed incidentally during the survey were recorded.

Otters, Water voles, and White-Clawed Crayfish.

On-site habitats were assessed for their suitability to support Otters, Water Voles and White-Clawed Crayfish.

Reptiles

All on-site habitats were assessed for their potential to support reptiles and all any pre-existing refugia including discarded plastics, paving slabs, bricks and wood were carefully examined in search of live individuals.

Risk Category	Definition
PRESENT	Presence confirmed in the course of current survey or recent, confirmed records.
HIGH	On-site habitat of high quality for a given species/species group. Site within/peripheral to a national or regional population stronghold. Good quality surrounding habitat and good connectivity.
MODERATE	On-site habitat of moderate quality, providing most or all of the known key requirements of a given species/species group. Local returns from the data search, within national distribution, suitable surrounding habitat. Factors limiting the likelihood of occurrence may include small habitat area, habitat severance, disturbance etc.
LOW	On-site habitat of poor to moderate quality for a given species/species group. Few or no returns from data search but presence cannot be discounted on the basis of national distribution, nature of surrounding habitats, habitat fragmentation, recent on-site disturbance etc.
NEGLIGIBLE	While presence cannot be absolutely discounted, the site includes very limited or poor quality habitat for a particular species or species group. No local returns from a data search, outside or peripheral to known national range for a species, surrounding habitat considered unlikely to support wider populations of a species/species group.
UNKNOWN	Insufficient data to make a determination of the risk of a species presence or absence.

Table.3.0 Criteria for assessing presence of protected species

3.4 Impact Assessment

The assessment was undertaken in accordance with CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd Edition. Chartered Institute of Ecology and Environmental Management, Winchester.

In summary the impact assessment process involves:

- Assessing the value of ecological receptors at the site and those nearby that could be affected (e.g. designated sites, habitats, species);
- Identifying the unmitigated impacts of the development (magnitude, spatial extent, duration, timing/frequency, reversibility);
- Providing measures to avoid and mitigate for impacts;
- Assessing the significance of residual impacts after specified mitigation;
- Identifying appropriate compensation measures to offset significant residual effects, and;
- Identifying enhancement opportunities to provide a new benefit for biodiversity.

Value/scale of ecological features:

The value of ecological features uses conservation status (i.e. extent, relative abundance and distribution) to assign geographic levels at which the feature is considered to hold importance.

Ecological features should be evaluated within a defined geographical context (CIEEM, 2018). These are based upon criteria identified in the CIEEM (2018) guidance, which categorise the geographic context of ecological importance as within one of the following:

- International and European;
- National;
- Regional;
- County, or local authority; and,
- Local Importance/Parish (High or Low Value).

Only features deemed “important ecological features” (the term used in CIEEM, 2018) are carried forward into the assessment of potential impacts. Important ecological features are:

- Considered to be sufficiently valuable to the decision-making process; and specifically of ”Local Importance (Higher value)” or higher using the geographic frames of reference in Appendix B and,
- Likely to be significantly affected by the project (CIEEM, 2018).

For habitats, this includes the structure and composition of plant communities, the species they may support, and over what distance the habitat may have influence over e.g. wetlands may attract wintering birds from hundreds of miles away, whereas a small block of scrub may only support fauna in the local area

For species, this includes the abundance and distribution within a given geographical area e.g. a small population of great crested newt may be assessed to be of ‘local’ importance in the south of England where populations are abundant but, but of ‘county’ importance in the north of England where the species is scarcer. In depth details of geographic values of importance are summarised in Appendix 3.

Ecological features valued at Local Importance (Lower Value) or of negligible value (as per the valuation criteria in Appendix 3) are not considered significant features and are scoped out of impact assessment.

It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable (CIEEM, 2018). In some cases, the data collected as part of the scoping process will be sufficient to inform the assessment of effects on a given feature. In other cases, additional surveys will need to be undertaken.

Ecological features which are within the zone of influence of a development, but not considered important ecological features, can be 'scoped out' (excluded), with justification.

Scale of impact and confidence levels:

Impacts on ecological features can occur either directly (e.g. loss of habitats, habitat fragmentation, noise/light disturbance) or indirectly (e.g. water/air quality, noise and light pollution, recreational disturbance). The overall impact is subjectively assessed taking into consideration a range of factors, including conservation status of an ecological feature, magnitude, spatial extent, duration, timing/frequency and reversibility. Impacts can be both positive and negative. The guidance used to quantify the scale of impacts is provided below;

Major	Loss of over 50% of a site feature, habitat or population Adverse change to all of a site feature, habitat or population For benefits, an impact equivalent in nature conservation terms to gain of over 50% of a site feature, habitat or population
Intermediate	Loss affecting 20-50% of a site feature, habitat or population Adverse change to over 50% of a site feature, habitat or population For benefits, an impact equivalent in nature conservation terms to a gain of 20-50% of a site feature, habitat or population
Minor	Loss affecting 5-19% of a site feature, habitat or population Adverse change to 20-50% of a site feature, habitat or population For benefits, an impact equivalent in nature conservation terms to a gain of 5-19% of a site feature, habitat or population
Neutral	Loss affecting up to 5% of a site feature, habitat or population Adverse change to less than 20% of a site feature, habitat or population For benefits, an impact equivalent in nature conservation terms to a gain of up to 5% of a site feature, habitat or population

Table 4.0 – Definitions of impact magnitude

The assessment of these impacts are subjective and based on predictions based on the available evidence and therefore may be inaccurate if predicted activities change or scale/extent of the proposed development alters. Therefore, we provide an indication of confidence levels for our assessment using the following criteria:

- Certain probability estimated at above 95%
- Likely probability estimated above 50% but below 95%
- Possible probability estimated at above 5% but below 50%
- Unlikely probability estimated at less than5%

Consideration is also given to the potential for the development proposal to give rise to significant negative impact in combination with other proposed development in the area, where relevant. An overall assessment of value and predicted impact is provided, and this is based upon the highest level of value of any of the features or species present or likely to be present on the site, and similarly the overall assessment would be the impact of greatest significance.

3.5 Legislation

Protected Species

Bats

All bat species are listed under Annex IV (and certain species also under Annex II) of the European Union's Council Directive 92/43/EEC (The Habitats Directive), and are given UK protected status by Schedule 2 of the Conservation of Habitats and Species Regulations 2017. Bats and their roosts also receive protection from disturbance from by the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000). This protection extends to both the species and roost sites. It is an offence to kill, injure, capture, possess or otherwise disturb bats. Bat roosts are protected at all times of the year (making it an offence to damage, destroy or obstruct access to bat roosts), regardless of whether bats are present at the time.

Birds

All bird species are protected under the Wildlife and Countryside Act 1981 as amended. This prevents killing or injuring any bird or damaging or destroying nests and eggs. Certain species (including barn owl *Tyto alba*) are also listed under Schedule 1 of the Wildlife and Countryside Act 1981, which prevents disturbance of the species or its nest and/or eggs at any time with protection by special penalties.

Reptiles

All native reptiles are listed on Schedule 5 of the Wildlife and Countryside Act 1981, and are afforded protection under Sections 9(1) and 9(5). For the reptile species occurring in Norfolk, adder *Vipera berus*, grass snake *Natrix natrix*, slow-worm *Anguis fragilis* and common lizard *Zootoca vivipara*, this protection prohibits deliberate or reckless killing and injury but does not include habitat protection.

Great Crested Newts

The great crested newt *Triturus cristatus* is fully protected in accordance with both national and international legislation. The species is listed under Annexes IV and II of European Directive 92/43/EEC, and Schedule 2 of The Conservation of Habitats and Species Regulations 2017. The species is also protected by Sections 9(4) and 9(5) of the Wildlife and Countryside Act 1981 as amended. It is an offence to knowingly or recklessly kill, injure, disturb, handle or sell the animal, and this protection is afforded to all life stages. It is unlawful to deliberately or recklessly damage, destroy, or obstruct the access to any structure or place used for shelter or protection; this includes both the terrestrial and aquatic components of its habitat.

Badger

Badgers *Meles meles* are protected under the Protection of Badgers Act 1992 and the Wildlife and Countryside Act 1981 (as amended). Under Section 1 of the Protection of Badgers Act 1992, it is a criminal offence, subject to certain mitigating circumstances, to illfully kill, injure or take a badger, and under Section 3 of this legislation it is a criminal offence, in most circumstances, to destroy, damage or obstruct access a badger sett or part of it. A badger sett is defined in the 1992 Act as any structure or place that displays signs indicating use by a badger. Although a sett may be empty at a

particular time, it may be used as part of a regular cycle throughout the year, and can therefore be considered to be in use. Under certain conditions, activities that could otherwise give rise to an offence may be licensed by the Department for Environment, Food and Rural Affairs (Defra) (for agricultural or land drainage purposes) or Natural England (for development covered by planning permission). A sett which can be shown to have been unused for at least a full year is considered to fall outside of the provisions of the 1992 Act. The badger is listed under Schedule 6 of the Wildlife and Countryside Act 1981 (as amended), which identifies animals that may not be killed or taken by certain methods.

Statutory Designated Conservation Sites

National ecological designations, such as Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR), are also afforded statutory protection. SSSIs are notified and protected under the jurisdiction of the Wildlife and Countryside Act 1981 as amended. SSSIs are notified based on specific criteria, including the general representativeness and rarity of the site and of the species or habitats supported by it.

Local Non-statutory Designated Conservation Sites

Local sites of importance to biodiversity, but falling below the criteria for SSSI selection, are designated in Suffolk as County Wildlife Sites (CWS). These sites have no statutory protection, but are normally given consideration within local plans.

Species and Habitats of Principal Importance

Other priority species and habitats which are a consideration under the National Planning Policy Framework (NPPF) 2012, placing responsibility on Local Planning Authorities to aim to conserve and enhance biodiversity and to encourage biodiversity in and around developments. There is a general biodiversity duty in the Natural Environment and Rural Communities (NERC) Act 2006 (Section 40) which requires every public body in the exercising of its functions to 'have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'. Biodiversity, as covered by the Section 40 duty, includes all biodiversity, not just the Habitats and Species of Principal Importance.

Section 41 of the NERC Act lists a number of species and habitats as being Species/Habitats of Principal Importance. These are species/habitats in England which had been identified as requiring action under the UK BAP, and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework. The protection of either Species of Principal Importance or Habitats of Principal Importance is not statutory, but "specific consideration"1 should be afforded by Local Planning Authorities when dealing with them in relation to planning and development control. Also, there is an expectation that public bodies would refer to the Section 41 list when complying with the Section 40 duty.

4. LIMITATIONS

4.1. Desk Study

These results can only give an indication of species presence in this location. The absence of recent records for certain species in an area may be due to the lack of survey effort or the non-submission of records, rather than the absence of those species. Many species records are also at low resolution and do not indicate their exact location.

4.2. Field Survey

The comprehensiveness of the ecological assessment was limited by the season in which the site visit was made. To confirm the presence or absence of all protected species usually requires multiple visits at suitable times of the year. Summer surveys between May and September are considered optimal. The site visit focussed on assessing the potential of the site to support species given protection under British or European law. In view of the above constraints this assessment cannot be considered to provide a comprehensive survey of the ecological interest of the site. It does however provide a "snapshot "of the ecological interest present on the day of the visit and highlights areas where further survey work may be required.

Figure 2.0 – Aerial View of site and surrounding landscape- January 2021- Google Earth

5. DESK STUDY RESULTS

5.1 Statutory Sites [1]

There are no statutory designated sites within a 2km radius of the site.

5.2 Non-Statutory sites [2]

There is a Roadside Nature Reserve and 2 County Wildlife Sites (CWS) within 2km of the site as detailed in Table 5.

Site Name	Grid Reference/Area	Distance & Direction	Description
Turkey Hall Meadow CWS-102	TM290807/1.56ha	505m south-east	This County Wildlife Site consists of two meadows located in front of Turkey Hall (…). The grassland sward supports a high diversity of flowering plants. Wild carrot, glaucous sedge, cowslip and ox-eye daisy are amongst the more common indicator plants of unimproved meadows which occur here."
Mill Lane CWS-103	TM294808/0.39ha	1,054m south-east	"Mill Lane is an unmetalled, ancient green lane which runs between arable fields to the north of Metfield village. (…) Ancient hedges (biodiversity priority habitat) border both sides of the lane (…). The grass verges of the lane include a number of indicator plants of unimproved lowland meadow grassland (biodiversity priority habitat) e.g. pepper saxifrage, pyramidal orchid and cowslip. There is also a small population of sulphur clover (nationally scarce)."
Roadside Nature Reserve 164	TM 28508233 to TM 28638226/300m²	1,080m north	The site is designated for the presence of sulphur clover (*Trifolium ochroleucon*) (Red List Status GB/England).

Table 5.0- Statutory Sites within 2km

Pond and waterbodies:

A search for ponds and waterbodies within 250m was conducted using Ordnance Survey Data (OS Explorer Map 237 Scale 1:25,000) and publicly available Environment Agency data: There is one pond (P1) situated within the application site to the south of the existing buildings. There are a further 6 ponds within 250m, the nearest within the grounds of Highfields to the north.

Protected habitats and habitats subject to conservation designations:

There are no priority Habitats, as listed under the NERC Act 2006 Section 41 Habitats of Principal Importance found on site. Other Priority Habitats to occur within 2km (identified using MAGIC – managed by Natural England), include Deciduous Woodland approximately 50m west (Highfields), Lowland Meadow 500m south-east and Coastal and Floodplain Grazing Marsh 1,460m north-west.

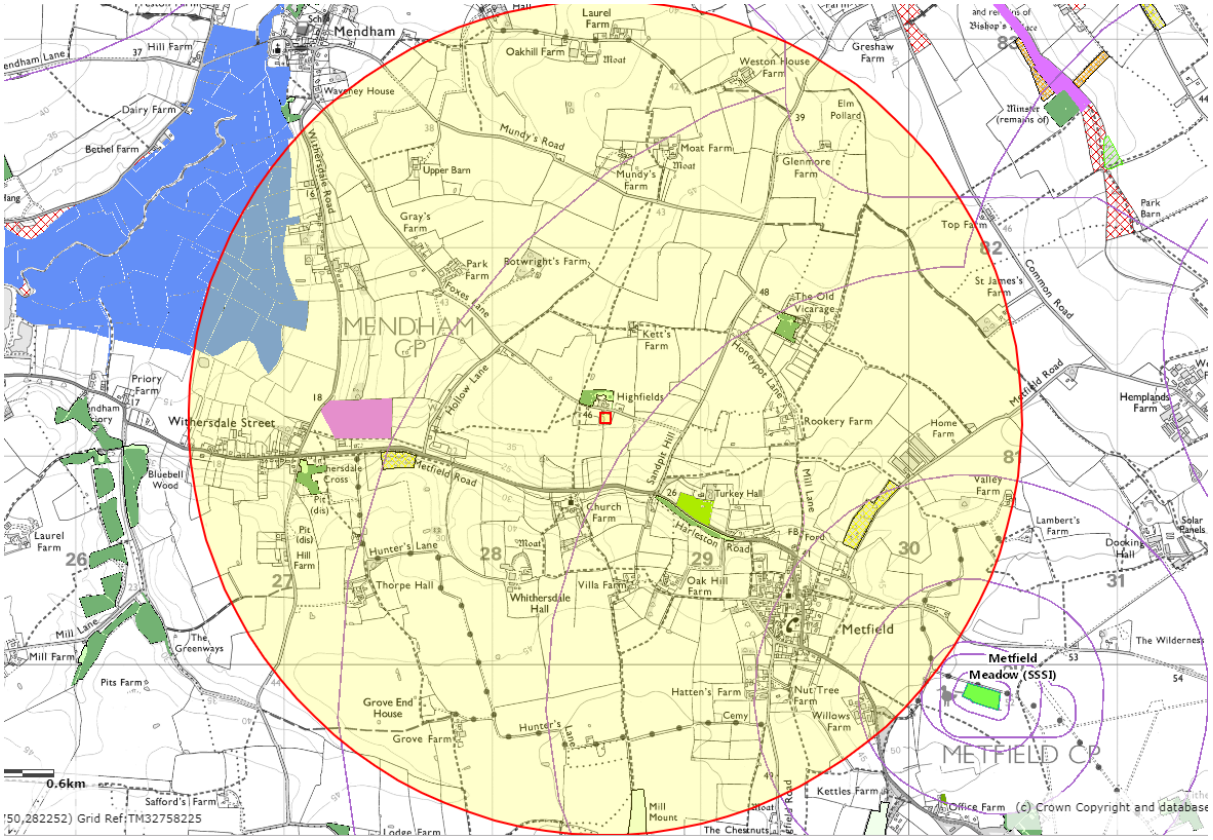

Figure 3.0- Map of Designated Wildlife Sites and Statutory Designated Sites within 2km Search Radius – Magic

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1 Statutory designation include Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR).

2 Non-statutory sites are designated by local authorities and protected through the planning process (e.g. County Wildlife Sites, Sites of Importance for Nature Conservation or Local Wildlife Sites).

3 Legally protected species include those listed in Schedules 1, 5 or 8 of the Wildlife and Countryside Act 1981; Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended); or in the Protection of Badgers Act 1992 (as amended).

4 Notable species include Species of Principal Importance under the Natural Environment and Rural Communities Act 2006; Local Biodiversity Action Plan (LBAP) species; Birds of Conservation Concern (Eaton et al., 2009); and/or Red Data Book/nationally notable species (JNCC, undated).

5.2. Notable species [3] [4]

A search for relevant notable and protected species records within 2km of the site returned a number of priority and protected species records:

The biodiversity data search within 2km of the site indicated 574 protected species records. The protected species recorded within 2km include 22 flowering plant species, seven insect species, 68 bird species, three amphibian species (including GCN), hedgehogs *Erinaceus europaeus*, water voles, brown hares *Lepus europaeus*, harvest mice *Micromys minutus* and at least 7 bat species:

Scientific Name	Common name	Legal/conservation status	≤ 250m
Smooth Newt	*Lissotriton vulgaris*	Sch. 5	Yes
Great Crested Newt	*Triturus cristatus*	EPS; Sch. 5; S. 41	
Common Frog	*Rana temporaria*	Sch. 5	Yes
Grass Snake	*Natrix helvetica*	Sch. 5; S. 41	Yes
Barn Owl	*Tyto alba*	Sch. 1	
Tawny Owl	*Strix aluco*	Amber Status	
Swift	*Apus apus*	Amber Status	Yes
Skylark	*Alauda arvensis*	Red Status; S. 41	
House Martin	*Delichon urbicum*	Amber Status	
Dunnock	*Prunella modularis*	Amber Status; S. 41	Yes
Song Thrush	*Turdus philomelos*	Red Status; S. 41	Yes
Mistle Thrush	*Turdus viscivorus*	Red Status	
Spotted Flycatcher	*Muscicapa striata*	Red Status; S. 41	
Starling	*Sturnus vulgaris*	Red Status; S. 41	
House Sparrow	*Passer domesticus*	Red Status; S. 41	Yes
Linnet	*Linaria cannabina*	Red Status; S. 41	
Bullfinch	*Pyrrhula pyrrhula*	Amber Status; S. 41	
Yellowhammer	*Emberiza citrinella*	Red Status; S. 41	
Treacle-mustard	*Erysimum cheiranthoides*	Suffolk Rare Plant	
Corn Chamomile	*Anthemis arvensis*	RLGB En.	
Shepherd's-needle	*Scandix pecten-veneris*	RLGB Cr; S. 41	
Wall	*Lasiommata megera*	S. 41	
Small Heath	*Coenonympha pamphilus*	S. 41	
Hedgehog	*Erinaceus europaeus*	S. 41	
Western Barbastelle	*Barbastella barbastellus*	EPS; Sch 5; S. 41	
Serotine	*Eptesicus serotinus*	EPS; Sch 5	
Daubenton's Bat	*Myotis daubentonii*	EPS; Sch 5	
Natterer's Bat	*Myotis nattereri*	EPS; Sch 5	
Pipistrelle Bat species	*Pipistrellus*	EPS; Sch 5	Yes
Common pipistrelle	*Pipistrellus pipistrellus*	EPS; Sch 5	
Soprano Pipistrelle	*Pipistrellus pygmaeus*	EPS; Sch 5; S. 41	
Brown Long-eared Bat	*Plecotus auritus*	EPS; Sch 5; S. 41	
Harvest Mouse	*Micromys minutus*	S. 41	
Brown Hare	*Lepus europaeus*	S. 41	

Multiple slow worm records are available for numerous sites along the edge of the wider Waveney valley, including Homersfield, Redenhall, Harleston gravel pits, Earsham and Wortwell nearby (*H. Booth, local observations*).

6. RESULTS OF PHASE 1 HABITAT SURVEY

6.1. Habitats and Vegetation

Table 6.0 below details the habitats recorded on site, the dominant species present and their overall biodiversity value

Habitat	Description	Dominant Species	Biodiversity Value	Additional notes
Arable J2	Arable habitat was situated around the perimeter of the south and east boundaries of the wider site area and forming an area of proposed garden land. This habitat was dominated by bare ploughed earth and cereal crops. There were no flowering plants associated with this habitat.		Low	Arable habitat is not a UKBAP habitat or Principal Habitat of Importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 - Habitats and Species of Principal Importance in England.
Buildings J3.6	There are two structures within the site. Building 1 (B1) is a concrete block and steel framed agricultural building with asbestos sheet roof. Adjoining this to the east is a corrugated tin sheet Nissan hut (B2)		Low	Occasional pigeon nests. No evidence of barn owls or bats. Negligible bat roost potential.
Improved Grassland J1.2	Improved grassland habitat was situated across most of the proposed development area. The grassland was well managed as shown by the short sward height <5cm	Ryegrass (>50% Lolium perenne), common nettle (*Urtica diocia*), cleavers (*Galium aparine*), broad-leaved dock (*R. obtusifolius*), creeping buttercup *(Ranunculus repens),* yarrow (*Achilliea millefolium*), white clover (*Trifolium repens),* daisy (*Bellis perennis),* bristly ox-tongue (*Helminthotheca echioides*), groundsel (Senecio vulgaris), creeping thistle	Low	The grassland was regularly mown and contained a low diversity of common species.

		(*Cirsium arvense),* ribwort plantain *(Plantago anceolate),* Dove's foot cranes-bill (*Geranium mole)* and ground ivy (*Glechoma hederacea)*		
Scattered Trees A3.1	A small number of self-set scattered trees are present around the Nissan hut and along the south and west boundaries adjacent to the pond (P1). A mature poplar is located in the north-east corner on the road edge (T1)	Crack willow (*Salix fragilis),* oak (*Quercus robur),* elm (*Ulmus minor),* elder (*Sambucus nigra)* and Lombardy poplar (*Populus nigra)*	Moderate	2 x Mature willow trees bordering the pond have moderate/high roost potential and poplar tree (T1) on road frontage.
Species poor defunct hedgerow J2.2.2	H1- The site is bordered to the south and west by defunct species poor hedgerow and trees.	H1- Oak (*Quercus robur),* willow (*Salix fragilis),* elm (*Ulmus glabra),* hawthorn and blackberry (*Rubus fruticosus).*	Moderate	Hedgerows provide important habitat for nesting birds, bats, amphibians, reptiles and small mammals. Possible bat foraging/commuting corridor.
Standing Water G1	To the south west corner of the site is a pond (P1) measuring approximately 40m by 20m with a shallow depth of less than 20cm at the north end and increasing to around 10feet at the south end. Pond contains some fish and waterfowl and there is abundant aquatic and emergent vegetation.	Common reed (*Phragmites australis),* soft rush (*Juncus effusus)* and reed mace (*Typhas latifolia))*	Moderate	Provides habitat for aquatic invertebrates, waterfowl, amphibians, water vole and grass snake.
Tall Ruderal (C3.1)	Tall ruderal vegetation is occasionally present in patches within the grassland, around trees, hedges and	Nettle *(Urtica dioica)*, yarrow (*Achilliea millefolium*), cow parsley (*Anthriscus sylvestris),* hogweed (*Heracleum sphondylium),* ragwort	Low	Provides some additional cover for birds, small mammals and herpetofauna. Ragwort provides habitat for cinnabar

	building edges where less intensively managed.	(*Jacobaea vulgaris),* mugwort (*Artemisia vulgaris),* garlic mustard (*Alliaria petiolata),* thistle (*Cirsium spp.).*		moth.

Table 6.0 – Habitats and Vegetation

6.2. Protected Species Potential

Faunal species observed or evidence of presence at the site or in close proximity to the site is presented in Table.7.0

Common Name	Scientific Name
Blackbird	*Turdus merula*
Blue tit	*Cyanistes caeruleus*
Gold crest	*Regulus regulus*
Great tit	*Parus major*
Pigeon	*Columba palumbus*
Rabbit	*Oryctolagus cuniculus*
Robin	*Erithacus rubecula*
Rook	*Corvus frugilegus*

Table.7.0 Faunal species recorded

Table 8.0, below, details the suitability of habitats within the site for key protected species. Species not detailed below are considered unlikely to be significantly impacted by the proposed works.

Species	General Habitat Requirements	Suitable habitat within site	Additional notes (e.g. evidence of species)
Reptiles	Long grass, scattered scrub, hedgerows	Hedgerows, pond margins	The habitats on the site are considered predominantly unsuitable for reptiles, consisting of short mown grassland and buildings. The boundary hedging, trees and pond area provide some suitable reptile foraging and hibernating habitats.
Invertebrates	Species-dependent. High invertebrate diversity is favoured in sites with a mosaic of habitats and diverse plant assemblage.	Scattered trees and hedgerows.	Given the limited size of the site and low diversity of suitable habitats and species, it is unlikely that the site supports any rare or notable invertebrate populations or a diverse invertebrate assemblage.
Nesting birds	Trees, shrubs, scrub, hedgerows, cavities within buildings, waterbodies, arable fields, bare/stony ground.	Open buildings, trees, hedgerows	Evidence of birds nesting in boundary trees and hedge lines and inside building B1
Badger	Woodland, dense scrub, meadows, field edges.	Permanent grassland on and adjacent to site and access through the gaps in boundary hedges.	No Badger setts were found within 30m of the site. No evidence of badgers was found within the site during the survey, such as setts, footprints, latrines, feeding evidence or hairs. Habitats within the local

			vicinity include, hedgerows, tree lines and deciduous woodland, providing suitable habitats for badger setts, foraging and commuting.
Great crested newts	Breed in ponds and other waterbodies. Terrestrial habitat includes woodland and grassland.	Hedgerows. 7 ponds within 250m of site. Pond 1 has good potential for great crested newts (0.71).	Some suitable terrestrial habitat for GCN, construction area comprises short mown grassland and buildings of limited value. The boundary hedges, pond (P1) and rough marginal vegetation provide some suitable GCN foraging and commuting habitats.
Bats	Roost in buildings, tree cavities and caves.	The hedgerow trees all have negligible roost potential lacking features such as rot holes, flaking bark, fissures and creeping ivy. Two mature crack willow trees bordering the pond (T2 & T3) and a poplar on the road frontage (T1) had moderate roost potential with cracks, splits, knot holes and aerial deadwood. Buildings to be demolished both have negligible roost potential.	Boundary habitats including hedgerows are likely used by foraging and commuting bats. Possible roosting habitat in the adjacent buildings and good foraging habitat in the vicinity (i.e. trees, hedges, pasture).
Water Vole, Otter and White-Clawed Crayfish	Standing and running water bodies including rivers, streams, lakes, ponds, drains and ditches.	Pond P1 has good suitability for water voles with steep densely vegetated banks and riparian vegetation is abundant. Unlikely presence of otter or crayfish.	The habitats on and directly adjacent the site was considered unsuitable for otters and white-clawed crayfish, with no burrows, holts or signs of use observed.

Table 8.0 – Protected and Priority Species

6.3 Preliminary Tree and Building Roost Assessment-

Trees- A search was made of the scattered and boundary trees for potential bat roosting features. All of the trees were found to have negligible/low roost potential apart from:

- T1- Lombardy Poplar- Mature tall specimen with dense foliage and creeping ivy- **Moderate**
- T2- Crack Willow- Mature specimen on pond edge, splits, tears and cracks-**Moderate/High**
- T3- Crack Willow- Mature specimen on west boundary with splits, tears and cracks- **Moderate/High**

None of the hedgerow trees are being removed. A self-set elder bordering building B2 will be removed but this had no bat roost potential.

Subject to the protection and retention of these trees in accordance with BS:5837: 2012- Trees in Relation to Design, Demolition and Construction no further works are required in respect of trees with bat roosting features. In the event that arboricultural works are required then a more detailed inspection of these trees must be first undertaken.

Figure.4.0- *T1 poplar (left), T2 willow (middle), T3 willow (right)*

Buildings-

Building section	Description
Building 1 (B1)  **North roadside elevation**  **Internal view of building**	The building measures approximately 15m by 15m with a smaller central store approximately 6m by 5m adjoining building B2. The building is of concrete block construction and well pointed internally and externally. The building has a steel frame supporting a corrugated asbestos sheet roof. The building has two large openings in the north elevation and a broken window, there is a further door opening on the south-east elevation and further broken windows providing easy access to wildlife. No evidence of any bat activity or bat roosts was found. Some pigeon nests were present. Building is to be demolished. The building was assessed as having **negligible bat roost potential.**

Building 2 (B2)  **East elevation of Nissan hut building B2**  **Internal view of Nissan hut building**	Nissan hut approximately 20m by 9m. Constructed of a steel frame and corrugated tin sheets. The east end is enclosed with concrete block work and a sliding door. There is a pen vent hatch in the top of the wall and two glazed windows. The blockwork is mostly well pointed apart from minor cracking but none suitably large enough or deep enough to be used by roosting bats. A starling nest with chicks was observed in a hole in the soffit box on the west gable wall as pictures. Building assessed as having **negligible bat roost potential.** Building is to be demolished.

Table 9.0 – Preliminary building and bat roost assessment

6.4 Great crested Newt Assessment

Great crested newt is listed on Annexes II and IV of the EC Habitats Directive. It is protected under the Wildlife and Countryside Act (1981) (as amended) and is identified as a European Protected Species on the Conservation of Species and Habitats Regulations (2017). It is a UK BAP Priority Species and is listed on the local BAP.

There are 7 records of great crested newt (*Triturus cristatus*) within 2km (2005-2014), the nearest records being approximately 1.4km south-east at Hatten's Farm Barns, Metfield in 2014 and another from Metfield village in 2014 approximately1.2km south-east. There is a large pond in the south-west corner of the site and a further 6 within c.250m of the site (See Figure 5.0) and the nearest pond P1 was subject to a Habitat Suitability Assessment (HSI). While the pond would remain unaffected by the development the bordering terrestrial habitats and refugia may be lost. The impacts on amphibians (including Great Crested Newt) would be possible through clearance of vegetation and refugia causing habitat loss and direct mortality through construction activities.

Suitable habitats for commuting, foraging, sheltering and hibernating GCN is present along the margins only. The habitats surrounding the site are considered as of moderate value for newts, and the hedgerows and ditch may serve as connecting habitats between the proposed development site

and further suitable habitats for GCN such as ponds to the north, and small blocks of grassland and woodland.

During their terrestrial phase, great crested newts are typically taken to commute up to 500 m between their breeding pond and their terrestrial habitats, though as a general rule it is those suitable habitats within 250 m of a breeding site that are likely to be used most frequently and further recent research has shown that the majority of newts occur within 50 m of ponds, with few individuals being found at greater distances (EN, 2004) [5]

Whilst the tree lines, ditch (D1) and hedges provide some suitable terrestrial habitat the construction area comprises short mown grassland and buildings which does not constitute suitable shelter / refuge habitat, though may potentially be used for foraging and / or dispersal by individual newts. The core sustenance zone for the ponds identified are considered to be within 50m due to the suitable terrestrial habitat in the immediate vicinity of the ponds.

The terrestrial habitats within the site interior are of limited value dominated by patchy short improved grassland (June 2022) and tall ruderals. The boundary habitats of hedgerows, trees, scrub and ditches provide suitable habitat and there were frequent earth banks and rabbit diggings providing potential refugia and hibernaculum for this species.

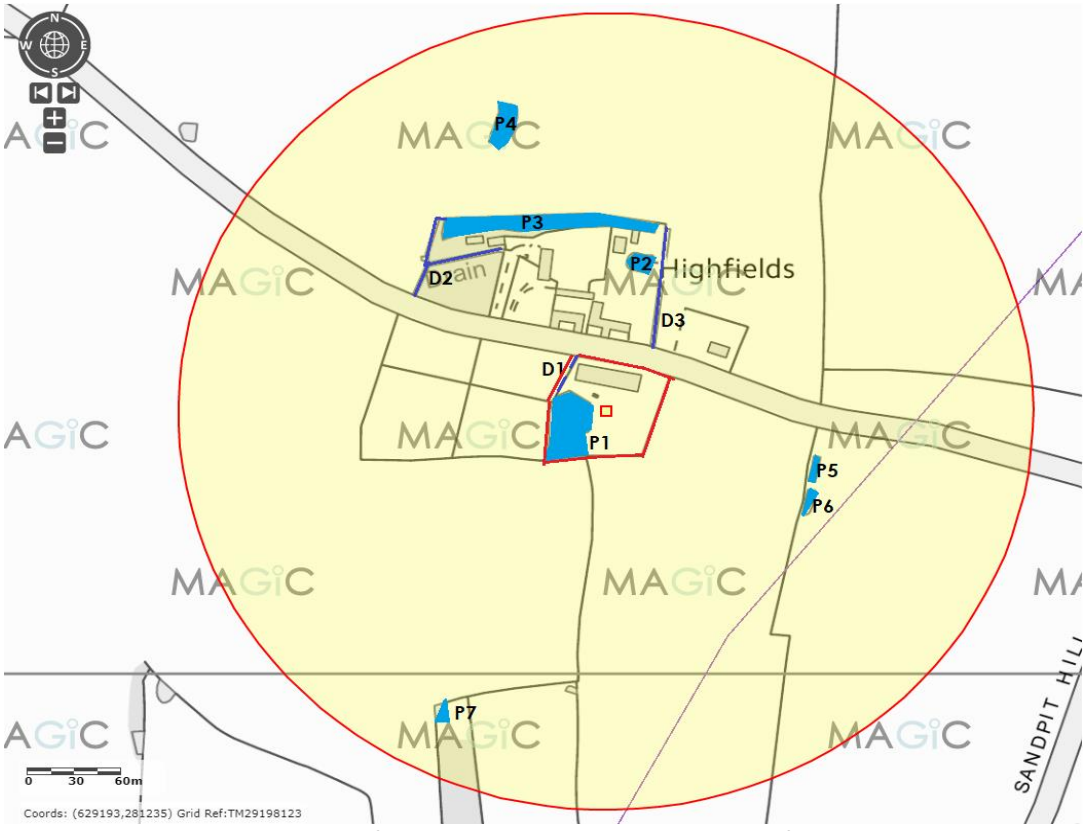

Figure.5.0- *Location of Ponds and Ditches within 250m of site boundaries*

The on-site pond P1 was assessed using the Categorisation of HSI scores; Lee Brady has developed a system for using HSI scores to define pond suitability for great crested newts on a categorical scale:

HSI Pond suitability:<0.5 = poor
0.5- 0.59 = below average
06-0.69 = average
0.7-0.79 = good
>0.8 = excellent

HSI	P1	P2-P7 Not accessible
S1- Geographic zone	1	
S2- Pond area	1	
S3- Pond drying	0.9	
S4- Water quality	0.67	
S5- Shade	1	
S6- Fowl	0.67	
S7- Fish	0.33	
S8- Pond density	1	
S9- Terrestrial habitat quality	0.67	
S10- Macrophyte cover	0.36	
HSI	0.71(Good)	Not accessible

Table 10– *HSI Assessment*

P1 was also assessed using eDNA sampling by Greenlight Ecology in 2020 and this returned a negative result, confirming no GCN population present. These documents are attached in the appendix.

The onsite pond has been confirmed to not hold a GCN population and works would therefore not affect this species.

Figure.6.0- *View of pond P1- June 2022*

[5] EN 2004 An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt Triturus cristatus English Nature Research Reports.

7. EVALUATION AND RECOMMENDATIONS

In the following section an outline of the likely impacts to ecological receptors from the proposed changes of use and development of the land. The possible magnitude of the impacts has been included at this stage to give an indication of the anticipated impacts to the ecological receptors identified above. The current intention is to remove as little of the natural habitats as possible other than to allow improved access to the site for development and post development.

The impacts should be further assessed in conjunction with a master plan. In line with the British Standard 42020:2013 Biodiversity – Code of practice for planning and development it is recommended that in conjunction with the designing of the master plan an Ecological Constraints and Opportunities Plan (ECOP) is employed to minimise any potential impacts, and maximise ecological benefits from the design stage of the project onwards. Impact magnitude categories and criteria are defined based on Byron (2000).

- Major negative – that which has a harmful effect on the integrity of a conservation site or the conservation status of a population of a species within a defined geographical area; e.g., fundamentally reduces the capacity to support wildlife for the entirety of a conservation site, or compromises the persistence of a species' population.

- Intermediate negative – that which has no adverse effect on the integrity of a conservation site or the conservation status of a species' population, but does have an important adverse effect in terms of achieving certain ecological objectives; e.g., sustaining target habitat conditions and levels of wildlife for a conservation site, or maintaining population growth for a species.

- Minor negative – some minor detrimental effect is evident, but not to the extent of the above.

- Neutral – that which has no predictable effect.

The potential impacts from the development of the site include construction and operational impacts

Habitats: The habitats on site comprise broad-leaved trees (A3.1), improved grassland (B4), bare ground (J4), standing water, hedging and trees (J2.3.2), scattered trees (A3.1) and tall ruderals (C3.1). Species recorded were typical of the habitats recorded at the site, although the variety of habitats present is likely to provide a suitable foraging and nesting resource for a range of species, including birds, bats, amphibians, terrestrial mammals and invertebrates.

The habitats within the site interior are of low to moderate ecological significance comprising species poor improved grassland, arable land and existing buildings which will be impacted and this will result in a likely minor adverse-neutral impact in the short-term but minor positive in the long term. The mature trees and hedging and the pond are of parish value however the proposed development does not extend into these areas. The unmitigated impact is assessed as being minor adverse, reduced to neutral within implementation of the recommended avoidance and mitigation in Section 5.0. and enhancements in Section 6.0.

Construction impacts:

Whilst the proposed land use change from agricultural to residential will not require notable or significant habitat loss, some minor short-term clearance in preparation for the construction works and associated services will remove/disturb vegetation. Insertion of infrastructure and foundations will disturb the soil structure, and give rise to spoil which may need removal from the site or re-distribution on the site. The proposed layout avoids the root protection areas (RPA's) of the trees, hedges and pond and so no ecological receptors will be likely lost or degraded. There will be a high level of human disturbance during construction, which may affect receptors outside the site as well as within it.

Post construction impacts:

The site will contain 2 dwellings which equates to 2 families or approximately 6-8 residents. Ground disturbance within the site will be increased as a result of more vehicle movements and habitats more intensively managed within the garden areas. There will be additional hard surfaces and lighting. Dwellings will have associated gardens, which will mature over time to include trees and shrubs. Buildings may offer potential habitats for some species. The following are an indication of the likely impacts to the ecological receptors associated with the site should a worst-case scenario be assumed.

7.1. Designated Sites

The development footprint falls outside all identified protected sites (statutory and non-statutory). The impact of the development on nearby statutory designated sites is considered to be neutral as there are no designated sites within a 2km radius. The impact on non-statutory sites, namely County Wildlife Sites (CWS), is considered also to be neutral on account of the separation distance, from site with no direct access from public rights of way and so no increase in recreational disturbance.

The proposed development falls inside Moorfield Meadow Site of Special Scientific Interest ("SSSI") Impact Risk Zones relating to rural residential developments. The proposed development is expected to have no effects on statutory or non-statutory protected sites or their qualifying features, owing to its relatively small scale, distance to protected sites and limited predicted impacts beyond the area of works. Given the small scale and type of the proposed development the impact of the development on statutory designated sites is considered to be **neutral.**

7.2. Habitats and Vegetation

Trees and Hedgerows

The boundary trees and hedging are the principal terrestrial habitat of value within the application site and so must be suitably retained and protected during works. This report includes an assessment of any trees which may have a Root Protection Area (RPA) within the footprint of the proposed working areas, access, services, fencing etc (See Figure 4). Tree protection measures and methods specified by a suitably qualified arborist and recommended in BS5837:2012 will be adhered to. The species poor hedges are not of sufficient age, length, quality etc. to qualify as an important or protected hedgerow.

Hedgerows are a UK Priority habitat under section 41 of the Natural Environment and Rural Communities (NERC) Act (2006). Whilst from the plans provided it appears that the proposed development retains the existing hedgerows, we recommend that a mechanism is secured to ensure that the hedgerows along the south and west boundaries are suitably protected from any adverse impacts during construction and post-development should consent be granted.

Habitats

The habitats within the site interior are of limited ecological value comprising short (<10cm) managed improved grassland and arable land with some marginal and unmown patches of tall ruderal vegetation is common and widespread and ultimately replaceable. The mature boundary trees and hedging as well as the pond (P1) and marginal vegetation are of greater ecological value will be retained and protected during construction.

The on-site pond is also of moderate/high ecological value providing habitat and foraging for a range of birds, amphibians, small mammals, including bats, waterfowl and invertebrates. The pond is mature and holds water all year with varying depths and bordered by established riparian vegetation and so the pond should be fenced off to avoid disturbance during demolition, clearance and construction works.

7.3. Protected and Notable Species

Please note that all evaluation and recommendations are based upon the findings of this preliminary ecological appraisal and on the proposals outlined in 2.4 above. If the site changes, then the potential for protected species to use the site may change accordingly. If the proposals alter from those at present, then it is possible that the likely impacts will also change.

Bats

Roosting bats - trees

The desk study revealed the presence of common pipistrelle, soprano pipistrelle, serotine, natterer's, daubenton's and brown long-eared bat within 2km of the site. The survey area offered some suitable roosting opportunities for bats with some trees supporting potential roost features. Whilst the proposed works are unlikely to have any direct impacts on bats as no notable trees are being removed and the buildings both have negligible roost potential. Mitigation has been suggested with regards to providing new bat roosting opportunities such as bat boxes, bat tiles etc. The unmitigated impact of the proposed development on roosting bats is provisionally assessed as being **neutral** due to their being few potential roosting areas and no trees being removed.

Foraging and commuting bats

The site contains suitable habitat for foraging and commuting bats along tree and hedge lines and pond area to the south-west, it is considered likely that foraging or commuting bats use the site to a certain extent. In order to avoid a detrimental impact on bats using the site, it is recommended that there should be no increased light spillage on to the pond, trees and hedgerows where bats are most likely to forage and commute. Lighting should be restricted to the interior of the site and should be kept to a low level. The following measures should be implemented within the lighting scheme:

- Minimise light spill, through use of lighting hoods, and setting the height and angle appropriately;
- Reduce the light intensity to the minimum required for safety and security;
- Set lighting curfews, e.g. lights off at night
- Where security lamps are used these should use a trigger to illuminate them (e.g. infra-red detector), and switch off after a short period, rather than remaining on all night.

The site is assessed as being of value at the **parish** scale for foraging and commuting bats. The unmitigated impact of the proposed development is provisionally assessed as being **minor adverse** due to disturbance during development works and a possible increase in lighting across the site. This would be reduced to **minor adverse-neutral** with the implementation of mitigation including a sensitive lighting scheme as detailed in Section 8.0.

Birds

Small passerines such as robin (*Erithacus rubecula*), great tit (*Parus major*) and blackbird (*Turdus merula)* were noted as well as magpie (*Pica pica)* and pigeon (*Columba palumbus*). The site supports bird nesting habitat, particularly in regard to the hedgerows and trees around the site perimeter which are suitable for common species such as wren (*Troglodytes troglodytes*), blackbird (*Turdus merula*), dunnock *(Prunella modularis*) and robin (*Erithacus rubecula*). The likely presence of ground nesting birds is low. The pond supports some waterfowl and waders including moorhen (*Gallinula chloropus*) and heron (*Ardea cinereal).* Inside the agricultural building (B1) were some recently used pigeon nests.

The site includes open buildings, hedging and trees which are suitable for nesting birds during the nesting season (1st March to 15th September inclusive). It is recommended therefore that building demolition, vegetation clearance, hedge cutting and arboricultural works are only undertaken outside the nesting season to avoid destruction of active nests. Vegetation removal may only be undertaken during the nesting season if a careful check by a suitably experienced ecologist can confirm that no active nests are present. If bird nests are present within vegetation to be removed, they must be left *in situ* and not disturbed until all the young have fledged and cease to return to the nest.

There is a Moderate risk of bird species breeding within vegetated habitats at the Site. Due to the size of the site and low diversity of habitats there is a Low risk of important bird assemblages being present. The site is considered to be of value at the **parish** scale for breeding birds. The unmitigated impact of the proposed development is assessed as being **minor adverse** due to the potential loss of suitable nesting/foraging habitat and temporary disturbance during the construction phase. Impacts would be reduced to **minor adverse-neutral** with the mitigation provided in Section 8.0.

Neutral effects are predicted for Schedule 1 bird species, as the habitats expected to be impacted by the development are believed to be unused by these species. Nesting birds are vulnerable to construction impacts including direct destruction of nests and indirect disturbance. Without best practice measures to reduce the risks, minor impacts on local populations of nesting birds would be probable, but not significant.

Great Crested Newts

The terrestrial habitat within the site, short mown grassland and buildings is of limited ecological interest. There are 7 ponds within 250m of the site. The proposed works are not expected to result in any loss of terrestrial habitats of value to GCN and no potential GCN aquatic breeding habitat will be affected by the proposed works. However, with the possibility of GCN present in the terrestrial habitats adjacent to the proposed demolition, clearance and construction works could result in injuring or killing individual newts and a low scale loss of GCN suitable terrestrial habitat.

A precautionary approach should be adopted to clearance and construction works. This includes strimming tall vegetation, checking wood and rubble piles by hand and ring-fencing building compounds. There is a Low risk of Great Crested Newt presence in the terrestrial and aquatic habitats on site and aquatic and terrestrial habitats adjacent to the site, largely due to the stocked fish in P1 and also the eDNA tests for both ponds P1 & P2 returning negative results. The site is considered to be of value at a **parish** scale for great crested newt. The unmitigated impact of the proposed development is neutral due to the confirmed absence of a population on site.

Reptiles

There are two records of grass snake *Natrix natrix* within 2km of the site, TM2782 (2018) and TM28 (2007). The proposed construction area is dominated by short mown grassland, arable land and buildings which is of low value for grass snake and other reptiles and so there are no obvious and immediate implications for slow-worms, common lizards or grass snakes. The adjacent grassland, ditch, scrub and on-site pond do provide some suitable habitat, particularly for grass snake. There is a Low risk of reptiles being present on the construction area. Common lizard and grass snake are protected from killing or injury under Schedule 5 (Section 9) and of the Wildlife and Countryside Act 1981 (as amended), it is also listed in the UK Biodiversity Action Plan as a species in need of conservation and greater protection.

No further survey for reptiles is therefore deemed necessary, although the site should be kept regularly mown to maintain its unsuitability to reptiles. The unmitigated impact of the proposed development is considered to be **minor adverse-neutral** due to the potential for loss/disturbance of boundary habitat features and the potential for killing and/or injury of reptiles during the clearance phase. This could be reduced to a **neutral** with the implementation of avoidance and mitigation as detailed in Section 8.0 which includes a precautionary approach to site clearance to prevent killing/injury of reptiles and amphibians and enhancements detailed in Section 9.

Badger

The data search returned no records of badger within 2km of the site. The boundary tree lines and hedges etc. provide habitat for badgers and the pasture fields to the west provide suitable habitat for foraging badgers and so cannot be excluded as the site has connectivity to the wider landscape. In the event that any badgers are found during the course of the proposed works, work should be halted immediately, Natural England should be informed and allowed time to advise on the best way to proceed. Badgers receive specific protection under the Protection of Badgers Act 1992. This means that it is unlawful to knowingly kill, capture, disturb or injure any individual or intentionally damage, destroy or obstruct an area used for breeding, resting, or sheltering badgers. It is possible

that badgers could cross the site during works if they are present within the wider area so recommendations as to best practice are given below. There is a Low risk of Badgers being present within the habitats on site. The site is considered to be of **parish** value for badger, subject to sensitive clearance and construction practices the impact is assessed as being **neutral.**

Invertebrates

Due to the common habitats present within the site, it is considered unlikely that the proposed works will significantly impact important populations of invertebrates. Mature trees within and adjacent to the site may provide some suitable habitat for saproxylic invertebrates, however the site lacks the required diversity of deadwood to support significant populations of saproxylic invertebrates and is therefore not considered to be of importance to saproxylic invertebrates outwith the zone of immediate influence. Other habitats within the application area are not considered botanically or structurally diverse enough to support protected or nationally/locally rare invertebrate species and as such are not considered to be of importance to nature conservation outwith the immediate zone of influence.

The proposed development offers good potential for enhancements, which will benefit invertebrates in the local area. Enhancements such as the planting of native trees and shrubs as well as species-rich wildflower grassland mix would be beneficial to a wide variety of invertebrates. Relaxing the cutting regime and establishing wildflower areas within the site will also be beneficial. The site is considered to be of value at a **parish** scale for invertebrates, with a **minor adverse** impact foreseen due to ground disturbance, vegetation loss and permanent loss of a small area of foraging habitat. The impact would be reduced to **neutral** with implementation of mitigation as recommended in Section 8.0.

Hedgehog and Brown Hare

Hedgehogs are protected under Schedule 6 of the Wildlife and Countryside act (as amended) and is listed as a Priority Species under the UK Biodiversity Action Plan. It is probable that hedgehogs are present on this site, at least at times. There is suitable habitat within the boundary grassland and hedgerow bases as well as the adjacent farmland and gardens. No hedgehogs or droppings were observed during the site survey.

There are numerous records of brown hare (*Lepus europaeus*) within a 2km radius of the site. The site contains limited habitat for this species, the site is less likely to be used for a form than the margins and open arable land of the type which is present adjacent to the site and in the wider area. There is a Low risk of Brown Hare and Harvest Mouse presence on site. The site is considered to be of **parish** value for terrestrial mammals with the unmitigated impact assessed as **minor adverse**, due to potential disturbance during clearance and construction. Impacts would be reduced to **minor adverse-neutral** with the implementation of mitigation measures as detailed in Section 8.0.

Water Vole

There is a single record of water vole (*Arvicola amphibious)* from 2014. The on-site pond has some steep densely vegetated banks and with abundant riparian vegetation which would provide suitable habitat for water voles. Due to the time of year and the depth of the pond it was not possible to undertake a detailed water vole survey which would be best undertaken in the spring when the

great crested newt survey is undertaken. The site is considered to be of **parish** value for water vole with the unmitigated impact assessed as **minor adverse**, due to potential disturbance to the banks and riparian vegetation during demolition, clearance and construction. Impacts would be reduced to **minor adverse-neutral** with the implementation of mitigation measures as detailed in Section 8.0.

Invasive Plant Species

No invasive plant or animal species listed on Schedule 9 of the Wildlife and Countryside Act (1981) (as amended) were recorded on the day of the survey. In summary, the significance of the ecological impact on the environment is considered to be at worst, moderate in the short term (during clearance and construction) provided appropriate steps are taken to mitigate any short-term threats to wildlife, especially protected species, that may be present on the site. This primarily includes nesting birds and amphibians. A summary of the ecological significance of the habitats on site is presented below, Table.11.0.

Ecological Feature	Scale of Value	Unmitigated Impact	Confidence Level	Residual or Long-Term Impact
Sites of International Importance	International	Neutral	Likely	-
Sites of National Importance	National	Neutral	Likely	Neutral
Sites of Local Importance	District	Neutral	Likely	Neutral
Habitats	Parish	Minor Adverse	Likely	Neutral/Minor positive
Green Infrastructure	Parish	Neutral	Likely	Neutral
Reptiles	Parish	Minor adverse-Neutral	Likely	Neutral
Great Crested Newts	Site Only	Minor adverse-Neutral	Likely	Neutral
Rare/Scarce Plant Species	Low	Neutral	Certain	Neutral
Veteran Trees	Negligible	Negligible	Certain	-
Invertebrates	Parish/District	Minor Adverse	Likely	Neutral
Amphibians (excluding GCN)	Negligible	Unknown pending further surveys	-	-
Breeding Birds	Parish	Minor Adverse	Likely	Minor Adverse-Neutral
Wintering Birds	Negligible	Negligible	Certain	-
Aquatic Mammals	Parish	Minor Adverse-Neutral	Likely	Neutral
Terrestrial Mammals	Parish	Minor Adverse	Likely	Minor Adverse-Neutral
Roosting Bats	Negligible	Minor adverse-Neutral	Likely	Neutral
Foraging/Commuting Bats	Parish	Minor Adverse	Likely	Minor adverse-Neutral

Table 11 – Summary of ecological features, unmitigated impact and residual impact with mitigation

8. AVOIDANCE AND MITIGATION

The development proposals for this site have been considered in terms of the mitigation hierarchy (BSI 2013) [7]. This consists of a 4-point framework of reference as reproduced below:

Avoidance, mitigation, compensation, and enhancement measures can be secured through planning conditions or obligations.

1. Avoidance should be the primary objective of any proposal.

If protected species are discovered on site either before or during the proposed works, all works should stop a suitably qualified ecologist should be contacted for advice on mitigation before continuing. Requirements below outline how impacts to reptiles, great crested newt, birds and small mammals such as hedgehogs can be avoided.

2. Mitigation measures aim to reduce or remove impacts.

Mitigation for this site should take the form of informed landscape planting and retention of boundary habitats to maintain a corridor for wildlife around and through the site.

3. Compensation is considered to be the last step on the hierarchy

Compensation 'should only be used in exceptional circumstances and as a last resort after all options for avoidance and mitigation have been fully considered' (BSI 2013). No compensation measures are considered necessary for these proposals.

4. Enhancement measures

These aim to provide opportunities for ecological gain as part of a development proposal in line with the NPPF13[8]. Suggestions for enhancement are provided below in Section 9.

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[7]BSI (2013). The British Standard BS 42020:2013 Biodiversity a Code of practice for planning and development

[8] National Planning Policy Framework (NPPF) March 2012

8.1 Demolition and Ground Clearance Works-

• As per the recommendations above building demolition, hedge and tree works across the site should ideally be performed outside of the active bird breeding season 1st March- 15th September inclusive. If this is not possible a bird surveyor should visit the site to check for evidence of nesting birds prior to any clearance works.

•Any artificial and natural refugia within the working areas (brash, grass, wood piles) would be hand-searched for the presence of reptiles and amphibians prior to commencement of works.

• A minimum buffer strip of 3m should be left undisturbed along the hedge bases (H1) and margins of the pond upon project completion to maintain habitat connectivity. Care should be taken with regards to vegetation clearance and earthworks due to potential disturbance to nesting birds, herpetofauna and small mammals.

8.2 Construction and Working Practices-

• The timing of demolition and construction works will be sensitive to nesting birds. If possible, it is proposed that operations within the working area would preferably be started outside of the bird breeding season to minimise the risk of disturbance to breeding birds that have already commenced nesting. Once works commence birds are unlikely to start nesting within the working area. However, in order to avoid accidental harm to nesting birds, a 15m buffer zone will be marked around any nest using high visibility fencing to ensure that the nest is not disturbed, damaged or destroyed whilst in use.

•If any ground nesting birds are found to be nesting within or close to the working areas during the pre-inspection survey or clearance, a 25m standoff from the nest will be marked out and observed, within which no operational activity would be permitted until the breeding attempt had concluded.

• Bird and bat boxes will be erected on the boundary trees to provide additional nesting and roosting opportunities and to compensate for potential disturbance to nesting birds. There is sufficient off-site habitat for nesting birds.

• In the event that protected species are discovered within the site, works would need to stop until the situation has been further assessed, and if necessary, a mitigation strategy developed and an application made for a site license.

• The site manager and other relevant staff will be briefed (by suitably qualified ecologist) on the possible presence of protected species in the area (Toolbox talk). Staff will be provided with information relating to the legislation which protects species and habitats and briefed on the procedures to prevent disturbance or destruction of individuals or their habitats. Staff will also be briefed on the emergency procedures to be implemented should protected species be found during clearance and construction works.

• Habitats removed, wherever possible will be replaced at the earliest opportunity with native or wildlife attracting species.

• Trenches, pits or holes dug on site that are to be left over night will be covered over or have a ramp placed in them so that any wildlife that falls in can climb out safely;

• The proposed location of the site compounds and any material storage areas will not extend into more important habitats, notably the pond margins, hedges and trees. These key areas should be fenced off with Heras fencing or similar to prevent direct habitat disturbance.

• Care should also be taken if lighting any bonfires as these may be potential hedgehog refugia/hibernation sites. Any brash and log piles on site will be searched by hand before removal/burning (see above) and if they are discovered they should be translocated to a suitable location.

8.3 Lighting-

•Any new external lights will be set on a motion detector and positioned in such a way that they do not shine on the tree canopies, hedges or pond area. Low intensity lighting should be used where possible in place of high intensity discharge or sodium lamps, this will minimize disturbance to foraging and commuting bats.

In accordance with the Bat Conservation Trust's publication *Bats and artificial lighting* (BCT, 2018) light pollution by artificial lighting will be kept to a minimum and light spillage avoided. The following specific mitigation will be put in place to minimize disturbance to bats caused by the lighting of the site. The following mitigation strategies have been taken from Bat Conservation Trust Landscape and Urban Design for Bats and Biodiversity (Gunnell et al., 2012) and other referenced sources:

- Minimise light spill by eliminating any bare bulbs and upward pointing light fixtures. The spread of light should be kept near to or below the horizontal plane, by using as steep a downward angle as possible and/or shield hood. Flat, cut-off lanterns are best;

- Use light sources that emit minimal ultra-violet light (van Langevelde and Feta, 2001) and avoid the white and blue wavelengths of the light spectrum, so as to avoid attracting insects and thus potentially reducing numbers in adjacent areas;

- Limiting the height of lighting columns to eight metres and increase the spacing of lighting columns (Fure, 2006) can reduce the spill of light into unwanted areas;

- Avoid using reflective surfaces under lights or light reflecting off windows (e.g. on to trees);

- Only the minimum amount of light needed for safety and access should be used and or turned off when the site is not in use;

- Artificial lighting proposals should not directly illuminate boundary habitats, which may be of value to foraging or commuting bats and birds (e.g. green corridors);

- Lighting that is required for security reasons should use a lamp of no greater than 2000 lumes (150 Watts) and be PIR sensor activated, to ensure that the lights are not on only when required (Jones, 2000; Collins, 2016);

8.4 Tree Works-

• All middle aged and mature trees where possible to be retained and protected in line with British Standard: 5837:2012 “Trees in Relation to Design, Demolition and Construction”

• If tree removal is scheduled between the months of 1st March and 15th September then a breeding/nesting bird survey should be first undertaken by the SQE.

• A search of any tree holes, cavities, flaking bark and dense creeping ivy will be undertaken to confirm the absence of any roosting bats, this is particularly important during the summer months when such features are used more frequently.

• In the event that any active nests are identified, no operational activity will be permitted within the stand-off zones until the breeding attempt had concluded.

8.5 Pollution Control-

Standard pollution prevention measures will be put in place including measures such as preventing dust by damping down bare ground and ensuring fuel is stored in bunded tanks. The Environment Agency PPG1 and PPG6 guidance on *General Guide to the Prevention of Pollution* and *Working at Construction and Demolition Sites* will be adhered to throughout the construction of the Proposed Development.

Liquid-

Many of the materials used in construction operations, such as oil, chemicals, cement, lime, cleaning materials and paint have the potential to cause serious pollution. All fuel, oil and chemical storage must be sited on an impervious base within a bund and secured. The base and bund walls must be impermeable to the material stored and of an adequate capacity.

Leaking or empty oil drums must be removed from the site immediately and disposed of via a licensed waste disposal contractor. The contents of any tank are to be clearly marked on the tank, and a notice displayed requiring that valves and trigger guns be locked when not in use. Concrete is highly alkaline and corrosive and can have a serious impact on groundwater, soil and watercourses. It is essential to take particular care with all works involving concrete and cement. Suitable provision is to be made for the washing out of concrete mixing plant or ready-mix concrete lorries so that washings do not flow into any drains or watercourse or seep underground.

Air, Noise and Vibration-

Contractors will be expected to take measures to minimize the presence of air borne dust during clearance and construction. If possible, any activities producing in excess of 70db should be avoided during the bird nesting season.

9. BIODIVERSITY ENHANCEMENT

The Natural Environment and Rural Communities Act 2006 (NERC) came into force on 1st October 2006. Under section 40 of the Act all public bodies have a duty to conserve biodiversity:

- "Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity."

Section 40(3) of the Act explains that:

- "Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat".

The duty applies to all local authorities and extends beyond just conserving what is already there to carrying out, supporting and requiring actions that may also restore or enhance biodiversity. This section sets out some measures which the developer should incorporate within the proposals to help maintain and improve the ecological value of the site generally during and after the proposed development.

9.1 Habitat Supplementation-

9.1.1 Birds – To increase nesting opportunities generally, 3 nest boxes should be installed. Installation of the nest boxes will be supervised by 'Eco- Check Ltd' or an experienced ecologist to ensure the correct positioning for each species.

The types of nest boxes could include;

- Schwegler 2M bird boxes (32mm)
- Schwegler 2GR nest boxes (27mm)
- Schwegler 1ZA wren roundhouse boxes
- Schwegler 1N deep nest boxes for robins
- Schwegler 1B general nest boxes

9.1.2 Bats- At present the availability of bat roosts within the site is Low. The combination of trees, hedges and grassland are valuable to foraging and commuting bats.

Bat Boxes- As a biodiversity enhancement and to compensate for the potential disturbance, 3 bat boxes will be erected and could include;

- 'Schwegler 1FD' bat boxes favoured by Pipistrelle and Long-Eared bats;
- 'Schwegler 1FF' bat boxes favoured by Pipistrelle and Noctule
- 'Schwegler 3FN' bat boxes, favoured by Noctule and Bechstein's bats;
- 'Schwegler 2F' bat boxes, attractive to the smaller British bats.
- 'Schwegler 1WQ' summer and winter roost box

These boxes are to be installed on the boundary trees within the site, ideally one on each elevation to provide the best variation in temperature, shelter and flight lines. If only one elevation is used this should be south-east facing as this provides the most shelter and warmth.

9.1.3 Plant native broad-leaved trees. Suggested species include; blackthorn (*Prunus spinosa*), crab apple (*Malus sylvestris sens.str*), elder (*Sambucus nigra*), field maple (*Acer campestre*), guelder rose (*Viburnum opulus*), hawthorn, honeysuckle (*Lonicera periclymenum*), holly (*Ilex aquifolium*) and English oak (*Quercus robur)* could be used to provide known benefit to wildlife.

9.1.4 Relaxing the grassland mowing regime and establishing 3m vegetated buffers strips along the pond margins will reduce the impacts of disturbance from residents and provide a valuable corridor for wildlife. There are also a number of records of Hedgehog, a UK Priority Species, in the surrounding area. To maintain connectivity for this species, all boundaries (including garden boundaries) should be made permeable to hedgehogs. This can be achieved by using hedgerow boundaries or gaps of 13x13cm, at ground level, in fences and walls.

9.1.5 Soft Landscaping

Any gaps in the hedgerows will be planted up with native species and/or species of known ecological value. As a biodiversity enhancement new hedgerow planting is proposed along the east and south boundaries with the arable fields. The value of the new hedging in the short-term (0-5 years) is considered to be low. The proposed planting schedule should contain native species as specified below.

Hedgerows-

Any new hedge planting should be double row staggered at 0.5m spacings with spiral guards and supports and maintained until established. The proposed hedgerow mix and planting to the following specification;

PLANTING SCHEDULE

HEDGEROW MIX (As necessary)				
SPECIES	DENSITY	AGE	ROOT	HEIGHT
25% Blackthorn (*Prunus spinosa)*	0.45m	1+1 or 1/1	BR	40-60cm
25% Hawthorn (*Crataegus monogyna)*	0.45m	1+1 or 1/1	BR	40-60cm
10% Guilder Rose (*Viburnum opulus)*	0.45m	1+1 or 1/1	BR	40-60cm
10% Dog Rose (*Rosa Canina)*	0.45m	1+1 or 1/1	BR	20-30cm
5% Wild Honeysuckle (*Lonicera periclymenum)*	0.45m	1+1 or 1/1	BR	20-30cm
5% Holly (*Ilex aquifolium)*	0.45m	1+1 or 1/1	CG-3l	40-60cm
10% Hazel (*Corylus avellana)*	0.45m	1+1 or 1/1	BR	40-60cm
5% Spindle (Euonymus europaea)	0.45m	1+1 or 1/1	CG-3l	40-60cm
5% Dogwood (Cornus sanguinea)	0.45m	1+1 or 1/1	CG-3l	40-60cm

10. Ecological Conditions and Recommendations for Further Surveys

The overall impact assessment does not take into consideration those species for which further information is required. To fully assess the site for, and the impact of the proposed development upon, protected species, detailed survey is recommended for the following species:

- Tree Roost Assessment - If the trees identified as containing bat roosting potential (T1-T3) within the PRA are likely to be impacted upon, i.e. where trees will be removed, root protection zones cannot be adhered to, or management is recommended by the appointed arborist, a detailed Tree Roost Assessment of the trees must be undertaken. This would include elevated surveys and/or dusk dawn surveys between May to September.

- No further surveys for breeding birds are required if the site is cleared outside the main bird breeding season (i.e. 1st March to 31st August). If work is proposed during the bird breeding season, the site should be checked for evidence of active nesting by a suitably qualified ecologist prior to work commencing.

- As the pond, boundary trees and hedgerows are the principle valuable habitats it is recommended that these are retained and protected for the duration of the development works.

- An Ecological Constraints and Opportunities Plan (ECOP) would highlight the boundary habitats as a moderate (and ultimately replaceable) constraint on development. Before the start of construction, it is recommended that in line with the British Standard 42020:2013 Biodiversity – Code of practice for planning and development - that a Construction Environment Management Plan (CEMP) is submitted and approved. The role of the CEMP is to ensure that the identified risks to biodiversity are assessed and that suitable methods are adopted on site to minimise the risks through the production of a method statement. The CEMP is also to ensure that biodiversity protection zones are enforced.

The suggested condition below is based on BS42020:2013 and in terms of biodiversity net gain, the enhancements proposed will contribute to this aim. Recommended condition:

PRIOR TO COMMENCEMENT: COMPLIANCE WITH ECOLOGICAL REPORT RECOMMENDATIONS

"All ecological mitigation and enhancement measures and/or works shall be carried out in accordance with the details contained within the report (Eco-Check, June 2022), as submitted with the planning application and agreed with the local planning authority prior to determination."

Reason: To conserve and enhance Protected and Priority species and allow the LPA to discharge its duties under the UK Habitats Regulations, the Wildlife & Countryside Act 1981 as amended and s40 of the NERC Act 2006 and s17 Crime & Disorder Act 1998.

"A 'statement of good practice' shall be signed upon completion by the competent ecologist, and be submitted to the LPA, confirming that the specified enhancement measures have been implemented in accordance with good practice upon which the planning consent was granted'.

11. REFERENCES

British Standards Institution (2013). BS42020 – Biodiversity – Code of practice for planning and development.

CIEEM (2017). Guidelines for Preliminary Ecological Appraisal. Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2015) Guidelines on Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd Edition. Chartered Institute of Ecology and Environmental Management, Winchester.

Froglife (1999) Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10, Froglife, Halesworth

Gent T & Gibson S (2003)- Herpetofauna Workers Manual. JNCC, Peterborough.

Hill, D, FashaM, Tucker G, Shewry M & Shaw P (2005) Handbook of Biodiversity Methods: Survey Evaluation and Monitoring, Cambridge University Press, Cambridge

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

DEFRA (2005) *Fifth Quinquennial Review of Schedules 5 and 8 of The Wildlife and Countryside Act 1981*. Department for Environmental, Food and Rural Affairs, London.

JNCC, (1993). *Handbook for Phase 1 Habitat Survey: A technique for environmental audit* (2010 reprint). Joint Nature Conservation Committee, Peterborough.

JNCC, (2006). Handbook for using the National Vegetation Classification.

Joint Nature Conservation Committee, 2003. Herpetofauna Worker's Manual. JNCC Publications, Peterborough.

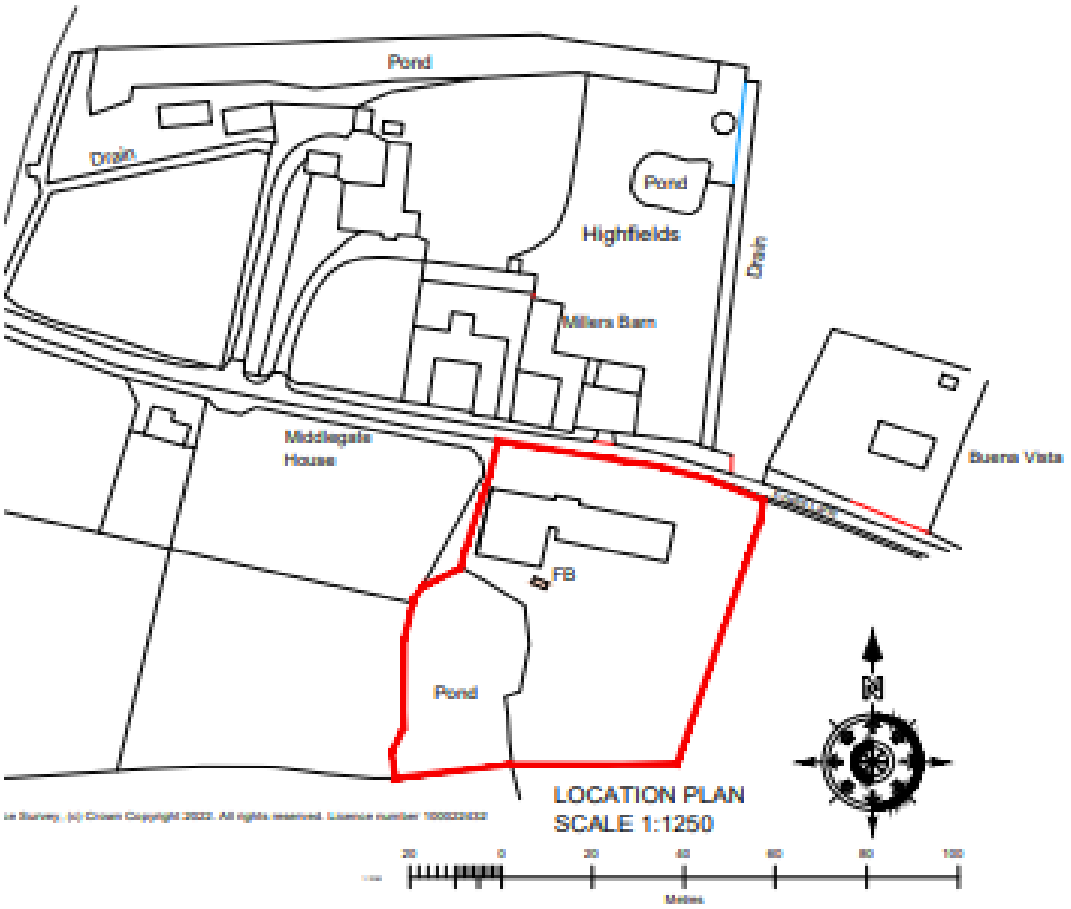
Froglife (2001), Great Crested Newt Conservation Handbook, Froglife, Halesworth, Suffolk

Mitchell-Jones, & McLeish, A.P. Ed.(2004),3rd Edition Bat Workers' Manual

Biodiversity 2020: A strategy for England's wildlife and ecosystem services (2011).

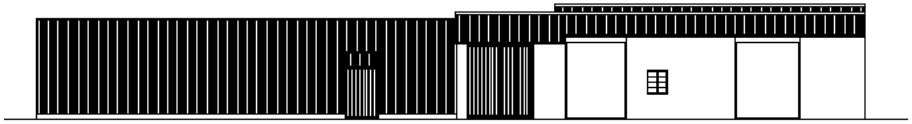
Natural England, MAGIC MAP Search, June 2022, www.magic.gov.uk

APPENDIX 1



Project: Two new dwellings	Site: Barn at Buena Vista, Foxes Lane, Mendham, IP20 0PE	HOLLINS Architects, Surveyors & Planning Consultants, The Guildhall, Market Hill, Framlingham, Suffolk, IP13 9BD	Scale: 1:1250 @ A4
Client: Mr J Stetenson	Details: Location Plan		Date: April 2022
			Drawn: JT
			Drawing No.: 22 28 - 03

Site Location Plan



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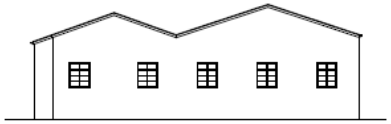

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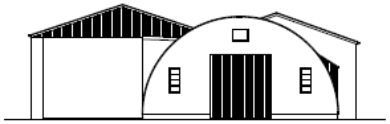

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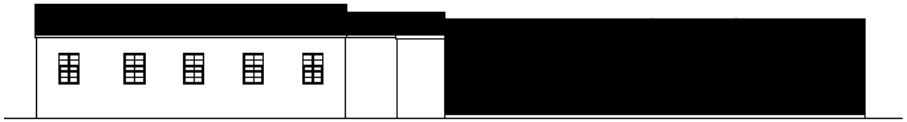

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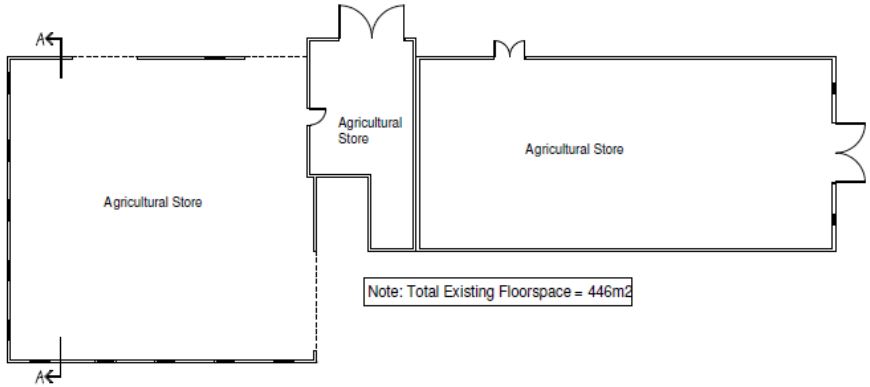

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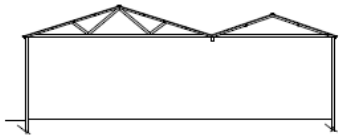


Existing Section A - A 1:100

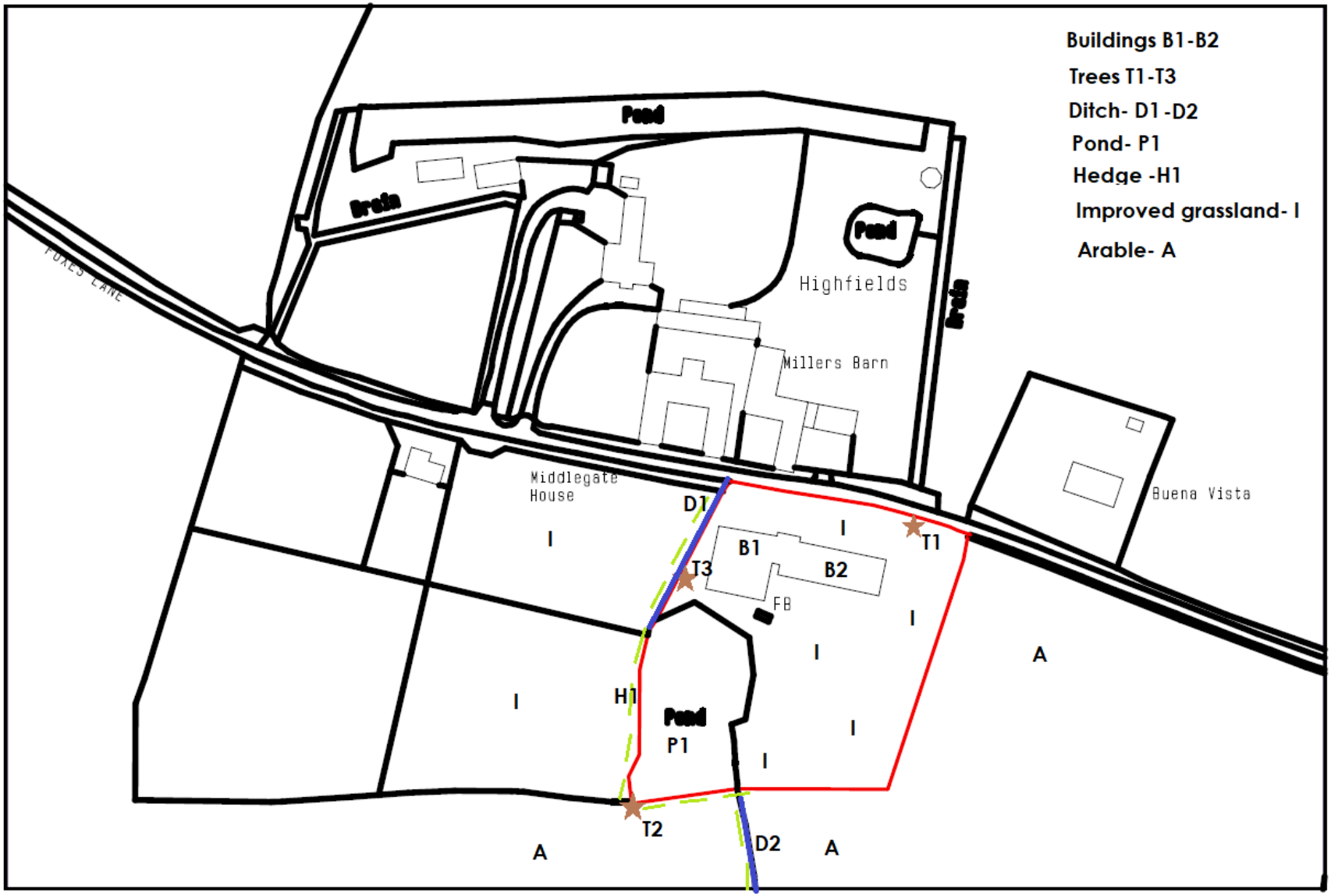
Graham Nourse
PLANNING CONSULTANTS LTD

3 Monet Square, Lowestoft, Suffolk NR32 4LZ
tel: 07999 883 702
e: graham@grahamnourseplanningconsultants.co.uk
w: grahamnourseplanningconsultants.co.uk

CLIENT	-
PROJECT	Proposed Barn Conversion Foxes lane, Mendham.
DRAWING	Existing Plans & Elevations
DRG. No	19/181/01
REVISION	-
SCALE	1:100.
DATE	October, 2019

Existing Buildings Layout and Elevations

Proposed Site Layout Plan and Access



Phase 1 Habitat Map Key

APPENDIX 2

Photo 1 – North roadside boundary and managed improved grassland	Photo 2 – Short mown grass and buildings B1 & B2
	
Photo 3 – Arable fields adjoining site	**Photo 4 – Dry ditch D2**
	
Photo 5 – Pond P1 riparian vegetation	**Photo 6 – Bird nest on light inside B1**
	

APPENDIX 3

Wildlife site legislation

A variety of sites are designated in the UK, under various Conventions, Directives and Regulations, for their nature conservation importance and interest. The general aim of these designations is to conserve and protect ecological resources in addition to raising awareness and understanding. Other non-statutory sites are afforded some protection through local plans.

RAMSAR Sites

Wetlands of international importance. Ramsar Sites are effectively protected, through the planning system, under the Wildlife and Countryside Act 1981, as amended, and the Countryside and Rights of Way Act 2000 through their notification as SSSIs and through other regulatory systems addressing water, soil and air quality.

Special Protection Areas (SPAs)

SPAs are the most important habitats for rare and migratory birds within the European Union. The Birds Directive, adopted by the UK in 1979, provides for the protection, management and control of all species of naturally occurring wild birds in the European territory of Member States, including the UK. The provisions of the Birds Directive are transposed into English law by the Conservation of Natural Habitats and Species Regulations 2010.

Special Areas of Conservation (SACs)

SACs are sites that are chosen to conserve the natural habitat types and species of wild flora and fauna listed in Annex I and II of the Habitats Directive. They are the best areas to represent the range and variety of habitats and species within the European Union. The provisions of the Habitats Directive were transposed into English law by the Conservation of Natural Habitats and Species Regulations 2010.

Sites of Special Scientific Interest (SSSIs)

SSSIs are nationally important sites for wildlife, geological and geomorphological features in England. They are designated and protected under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981, as amended. They receive additional protection under the Countryside and Rights of Way Act 2000.

National Nature Reserves (NNRs)

NNRs are nationally important areas of wildlife habitat and geological formations in Britain. NNRs are designated and protected under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981, as amended. They receive additional protection under the Countryside and Rights of Way Act 2000. They are managed for the benefit of nature conservation.

Local Nature Reserves (LNRs)

LNRs are similar to NNRs but they apply to the local context. They are sites of value to nature conservation and are designated under the National Parks and Access to the Countryside Act 1949. They are managed for the benefit of nature conservation.

Hedgerows

Hedgerows are a very significant wildlife habitat over large parts of Britain. They provide essential refuge for a great many woodland and farmland plants and animals. Hedgerows are given protection under The Hedgerows Regulations 1997. As a result, since 1 June 1997, it has been against the law to remove most countryside hedgerows (or parts of them) without first notifying the local planning authority.

Ancient Woodland

Ancient woodlands are woodlands that have been established since or before 1600AD. They are nonstatutory sites and are not legally protected but they may be afforded some protection in, for example, structure and local plans.

County Wildlife Sites

These non-statutory sites are sites designated by a local authority as being of County nature conservation value but may not be notified as SSSIs. These selected sites are known as wildlife sites (WS), sometimes called SINCs or SNCIs.

Local Sites

These non-statutory sites may be designated by a local authority as being of local nature conservation value but are not notified as SSSIs. They have a variety of titles dependent upon the designating authority.

Regionally Important Geological / Geomorphological Sites (RIGS)

Regionally Important Geological and Geomorphological Sites (RIGS) are designated by locally developed criteria and are currently the most important places for geology and geomorphology outside statutorily protected land such as Sites of Special Scientific Interest (SSSI). The designation of RIGS is one way of recognising and protecting important earth science and landscape features.

Species Legislation and Protection

The legislation which protects various species within the British fauna or flora is outlined below:

Birds

The Birds Directive (1979)

The European Community Council Directive on the Conservation of Wild Birds (79/409/EEC) sets out general rules for the conservation of all naturally occurring wild birds, their nests, eggs and habitats.

Wildlife and Countryside Act 1981

Sections 1 to 8 of the Wildlife and Countryside Act relate to the protection of birds. All birds, their nests and eggs are protected by law and it is thus an offence, with certain exceptions to:

- intentionally kill, injure or take any wild bird
- intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built
- intentionally take or destroy the egg of any wild bird
- have in one's possession or control any wild bird, dead or alive, or any part of a wild bird, which has been taken in contravention of the Act or the Protection of Birds Act 1954
- have in one's possession or control any egg or part of an egg which has been taken in contravention of the Act or the Protection of Birds Act 1954
- use traps or similar items to kill, injure or take wild birds
- have in one's possession or control any bird of a species occurring on Schedule 4 of the Act unless registered, and in most cases ringed, in accordance with the Secretary of State's regulations (see Schedules)

Countryside and Rights of Way Act 2000

This act strengthens the existing provisions of the Wildlife and Countryside Act 1981 for the enforcement of wildlife legislation, including a new offence of "recklessly" disturbing any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or recklessly disturbing the dependent young of such a bird.

UK Biodiversity Action Plan Priority Species

A number of British Birds are UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced. The protection of UK BAP Priority Species is implemented through Local Planning Policy.

Bats

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention or CMS) was adopted in Bonn, Germany in 1979 and came into force in 1985. Contracting Parties work together to conserve migratory species and their habitats by providing strict protection for endangered migratory species (listed in Appendix 1 of the Convention), concluding multilateral Agreements for the conservation and management of migratory species which require or would benefit from international cooperation (listed in Appendix 2), and by undertaking co-operative research activities.

The European Community is a party to CMS. In general it undertakes activities under the Convention involving issues where the Community has 'competence' (the authority to act as a Community rather than as the member states individually or collectively as the Union). Thus the Community is a Party to the Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS) as this agreement has significant relevance to fishing activities, over which the Community has authority within the Union.

The UK ratified the Convention in 1985. The legal requirement for the strict protection of Appendix I species is provided by the Wildlife & Countryside Act (1981 and as amended). The UK has currently ratified three legally binding Agreements under the Convention: the Agreement on the Conservation of Populations of European Bats (EUROBATS); the African-Eurasian Migratory Waterbird Agreement (AEWA); and ASCOBANS. An Agreement on the Conservation of Albatrosses and Petrels is currently in the process of being ratified; as of May 2002, eight countries including the UK had so far signed, and the Agreement will enter into force after five countries have ratified. The UK has also ratified the Memorandum of Understanding (MoU) on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia, in respect of the British Indian Ocean Territory.

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) 1979

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was adopted in Bern, Switzerland in 1979, and came into force in 1982. The principal aims of the Convention are to ensure conservation and protection of all wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to afford special protection to the most vulnerable or threatened species (including migratory species) (listed in Appendix 3). To this end the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species.

To implement the Bern Convention in Europe, the European Community adopted Council Directive 79/409/EEC on the Conservation of Wild Birds (the EC Birds Directive) in 1979, and Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the EC Habitats Directive) in 1992. Among other things the Directives provide for the establishment of a European network of protected areas (Natura 2000), to tackle the continuing losses of European biodiversity on land, at the coast and in the sea to human activities.

The Habitats Directive (1992)

The European Community Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) aims to protect the European Union's biodiversity. It requires member states to provide strict protection for specified flora and fauna (i.e. European Protected Species) outside of designated sites.

The Conservation of Habitats and Species Regulations 2010

The Conservation of Habitats and Species Regulations 2010 formally transpose the requirements of the Habitats Directive into national law (replacing the Conservation (Natural Habitats &c) Regulations 1994). They build on existing nature conservation legislation for the protection of habitats and species by introducing requirements for assessing plans and projects affecting European designations and licensing certain activities affecting European Protected Species. All bats are listed as 'European protected species of animals'.

Licences are required for checking known roosts or for carrying out work that may disturb bats, such as the management or disturbance of features that are known to be used as roosting sites.

Wildlife and Countryside Act 1981

This act provides varying degrees of protection for the listed species of flora and fauna. All UK native species of Bat are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). The legislation protects bats and their roosts under Section 9 of the Act, such that it is an offence to:

- Intentionally kill, injure or take a bat
- Possess, control or sell any live or dead specimen or anything derived from a bat
- Intentionally damage, destroy or obstruct access to any structure or place used for shelter or protection (i.e. a roost) by a bat
- Deliberately, or intentionally disturb a bat while it is occupying a roost

Countryside and Rights of Way Act 2000

This act strengthens the existing provisions of the Wildlife and Countryside Act 1981 for the enforcement of wildlife legislation, including a new offence of "recklessly" disturbing bats or recklessly damaging, obstructing or destroying their roosts.

UK Biodiversity Action Plan Priority Species

Several species of bat are UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced for these species. The protection of UK BAP Priority Species is implemented through Local Planning Policy.

Otter

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) 1979

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was adopted in Bern, Switzerland in 1979, and came into force in 1982. The principal aims of the Convention are to ensure conservation and protection of all wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to afford special protection to the most vulnerable or threatened species (including migratory species as listed in Appendix III of the Convention). To this end the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species.

To implement the Bern Convention in Europe, the European Community adopted Council Directive 79/409/EEC on the Conservation of Wild Birds (the EC Birds Directive) in 1979, and Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the EC Habitats Directive) in 1992. Among other things the Directives provide for the establishment of a European network of protected areas (Natura 2000), to tackle the continuing losses of European biodiversity on land, at the coast and in the sea to human activities.

The Habitats Directive (1992)

The European Community Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) aims to protect the European Union's biodiversity. It requires member states to provide strict protection for specified flora and fauna (i.e. European Protected Species) outside of designated sites.

The Conservation of Habitats and Species Regulations 2010

The Conservation of Habitats and Species Regulations 2010 formally transpose the requirements of the Habitats Directive into national law (replacing the Conservation (Natural Habitats &c) Regulations 1994). They build on existing nature conservation legislation for the protection of habitats and species by introducing requirements for assessing plans and projects affecting European designations and licensing certain activities affecting European Protected Species.

Licences are required for carrying out work that may disturb or injure Otter or destroy breeding sites.

Wildlife and Countryside Act 1981

This act provides varying degrees of protection for the listed species of flora and fauna. Otter is a Schedule 5 species and is fully protected under Section 9 of the Wildlife and Countryside Act (as amended) under which it is an offence to:

- intentionally kill, injure or take an Otter
- deliberately capture or kill an Otter
- possess or control any live or dead specimen or anything derived from an Otter
- intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by an Otter
- deliberately, intentionally or recklessly disturb an Otter while it is occupying a structure or place which it uses for that purpose

UK Biodiversity Action Plan Priority Species

Otter is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced. The protection of UK BAP Priority Species such as Otter is implemented through Local Planning Policy.

Water Vole

Wildlife and Countryside Act 1981

This act provides varying degrees of protection for the listed species of flora and fauna. Since April 2008 the water vole has received full legal protection through its inclusion on Schedule 5 of the Wildlife and Countryside Act 1981 in respect of Section 9. Full legal protection under the Act makes it an offence to:

- Intentionally kill, injure or take water voles.
- Possess or control live or dead water voles or derivatives
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection
- Intentionally or recklessly disturb water voles whilst occupying a structure or place used for that purpose.
- Sell water voles or offer or expose for sale or transport for sale.
- Publish or cause to be published any advertisement which conveys the buying or selling of water voles.

Countryside and Rights of Way Act 2000

This act strengthens the existing provisions of the Wildlife and Countryside Act 1981 for the enforcement of wildlife legislation, including a new offence of "recklessly" destroying or damaging the habitats of certain protected species, including water vole, or recklessly disturbing water vole.

UK Biodiversity Action Plan Priority Species

Water vole is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced. The protection of UKBAP Priority Species such as water vole is implemented through Local Planning Policy.

Brown hare

UK Biodiversity Action Plan Priority Species

Brown hare is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced for this species. The protection of UK BAP Priority Species is implemented through Local Planning Policy.

Hedgehog

UK Biodiversity Action Plan Priority Species

Hedgehog is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced for this species. The protection of UK BAP Priority Species is implemented through Local Planning Policy.

Great Crested Newt

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) 1979

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was adopted in Bern, Switzerland in 1979, and came into force in 1982. The principal aims of the Convention are to ensure conservation and protection of all wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to afford special protection to the most vulnerable or threatened species (including migratory species) (listed in Appendix 3). To this end the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species.

To implement the Bern Convention in Europe, the European Community adopted Council Directive 79/409/EEC on the Conservation of Wild Birds (the EC Birds Directive) in 1979, and Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the EC Habitats Directive) in 1992. Among other things the Directives provide for the establishment of a European network of protected areas (Natura 2000), to tackle the continuing losses of European biodiversity on land, at the coast and in the sea to human activities.

The Habitats Directive (1992)

The European Community Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) aims to protect the European Union's biodiversity. It requires member states to provide strict protection for specified flora and fauna (ie European Protected Species) outside of designated sites.

The Conservation of Habitats and Species Regulations 2010

The Conservation of Habitats and Species Regulations 2010 formally transpose the requirements of the Habitats Directive into national law (replacing the Conservation (Natural Habitats &c) Regulations 1994). They build on existing nature conservation legislation for the protection of habitats and species by introducing requirements for assessing plans and projects affecting European designations and licensing certain activities affecting European Protected Species.

Licences are required for carrying out work that may disturb or injure Great Crested Newts or destroy breeding sites.

Wildlife and Countryside Act 1981

This act provides varying degrees of protection for the listed species of flora and fauna. Great Crested Newt is a Schedule 5 species and is fully protected under Section 9 of the Wildlife and Countryside Act (as amended) under which it is an offence to:

- Intentionally kill, injure or take a Great Crested Newt
- Deliberately capture or kill a Great Crested Newt
- Possess or control any live or dead specimen or anything derived from a Great Crested Newt
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a Great Crested Newt
- Deliberately, intentionally or recklessly disturb a Great Crested Newt while it is occupying a structure or place which it uses for that purpose
- Deliberately take or destroy the eggs of a Great Crested Newt

UK Biodiversity Action Plan Priority Species

Great Crested Newt is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced. The protection of UKBAP Priority Species such as Great Crested Newt is implemented through Local Planning Policy.

Reptiles (Adder, Grass Snake, Slow worm, Common Lizard)

Wildlife and Countryside Act 1981

This act provides varying degrees of protection for the listed species of flora and fauna. All UK native reptiles are protected under Schedule 5 (Section 9) of the Wildlife and Countryside Act 1981 (as amended). Common lizard, Slow Worm, Grass snake and Adder receive partial protection under the Act. Only part of sub-section 9(1) and all of sub-section 9(5) apply; these prohibit the intentional killing and injuring and trade (i.e. sale, barter, exchange, transporting for sale and advertising to sell or to buy).

Countryside and Rights of Way Act 2000

This act strengthens the existing provisions of the Wildlife and Countryside Act 1981 for the enforcement of wildlife legislation, including a new offence of "recklessly" killing or injuring the above-listed species.

Biodiversity Action Plan Priority Species

Common Lizard, Grass Snake, Adder and Slow Worm are listed on the UK Biodiversity Action Plan as they are priority species for conservation. The protection of UKBAP Priority Species is implemented through Local Planning Policy.

Common Toad

UK Biodiversity Action Plan Priority Species

Common Toad is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced for this species. The protection of UK BAP Priority Species is implemented through Local Planning Policy.

Stag Beetle

UK Biodiversity Action Plan Priority Species

Stag Beetle is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced for this species. The protection of UK BAP Priority Species is implemented through Local Planning Policy.

Plants

Wildlife and Countryside Act 1981

The Wildlife and Countryside Act (as amended) provides protection to a number of species of plant as listed in Schedule 8. Section 13 identifies measures for the protection of wild plants. It prohibits the unauthorised intentional uprooting of any wild plant species and forbids any picking, uprooting or destruction of plants listed on Schedule 8. It also prohibits the sale, etc, or possession for the purpose of sale of any plants on Schedule 8 or parts or derivatives of Schedule 8 plants. It provides certain defences, e.g. provision to cover incidental actions that are an unavoidable result of an otherwise lawful activity.

UK Biodiversity Action Plan Priority Species

Several species of plant found in the area are UK Priority Species for Conservation under the UK Biodiversity Action Plan, for which National Species Action Plans have been produced.

Impact Assessment Methodology

Scale Level

County/ Metropolitan	• Designated or qualifying features within Local Nature Reserves or Wildlife Sites, selected on county/metropolitan criteria, or features that meet the published selection criteria for designation. • Semi-natural ancient woodland greater than 0.25 ha in area. • Significant and viable areas of habitat identified in County BAPs as requiring site protection. • Species populations of county/metropolitan importance. • Significant populations of a county/metropolitan important species (i.e. listed in a County/Metropolitan Red Data Book or BAP on account of their regional rarity or localisation).
• **District/Borough**	• Biological features within Local Nature Reserves, etc., selected on District/Borough ecological criteria. • Areas of habitat identified in a sub-County (District/Borough) BAP or in the relevant Natural Area profile, and other features that are scarce within the District/Borough or that appreciably enrich the District/ Borough habitat resource. • Diverse and/or ecologically valuable hedgerow networks. • Semi-natural ancient woodland smaller than 0.25 ha in area. • Species populations of District/Borough importance. • Significant populations of a District/Borough important species (i.e. listed in a local BAP on account of their local rarity or localisation).
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. Valuable biological features within Local Nature Reserves selected on Parish ecological criteria.

Scale	**Level of Value**
International	Very High
National	High
Regional	Medium
County/ Metropolitan	Medium
District/ Borough	Lower
Parish/ Neighbourhood	Lower

Table 1.2 Definitions of impact magnitude

Major	Loss of over 50% of a site feature, habitat or population Adverse change to all of a site feature, habitat or population For benefits, an impact equivalent in nature conservation terms to gain of over 50% of a site feature, habitat or population
Intermediate	Loss affecting 20-50% of a site feature, habitat or population Adverse change to over 50% of a site feature, habitat or population For benefits, an impact equivalent in nature conservation terms to a gain of 20-50% of a site feature, habitat or population
Minor	Loss affecting 5-19% of a site feature, habitat or population Adverse change to 20-50% of a site feature, habitat or population For benefits, an impact equivalent in nature conservation terms to a gain of 5-19% of a site feature, habitat or population
Neutral	Loss affecting up to 5% of a site feature, habitat or population Adverse change to less than 20% of a site feature, habitat or population For benefits, an impact equivalent in nature conservation terms to a gain of up to 5% of a site feature, habitat or population

Table 1.3 Impact significance

Value of Receptor	Major Negative	Intermediate Negative	Minor Negative	Neutral	Minor Positive	Intermediate Positive	Major Positive
International (Very High)	Severe Adverse	Severe Adverse	Major Adverse	Neutral	Major Beneficial	Major Beneficial	Major Beneficial
National (High)	Severe Adverse	Major Adverse	Moderate Adverse	Neutral	Moderate Beneficial	Major Beneficial	Major Beneficial
Regional (Medium)	Major Adverse	Moderate Adverse	Minor Adverse	Neutral	Minor Beneficial	Moderate Beneficial	Major Beneficial
County/Metropolitan (Medium)	Moderate Adverse	Minor Adverse	Minor Adverse	Neutral	Minor Beneficial	Minor Beneficial	Moderate Beneficial
District/Borough (Lower)	Moderate Adverse	Minor Adverse	Minor Adverse	Neutral	Minor Beneficial	Minor Beneficial	Moderate Beneficial
Parish/ Neighbourhood (Lower)	Minor Adverse	Minor Adverse	Minor Adverse	Neutral	Minor Beneficial	Minor Beneficial	Minor Beneficial
Negligible	Neutral	Neutral	Neutral	Neutral	Minor Beneficial	Minor Beneficial	Minor Beneficial

Hedgerow Woody Species

From Schedule 3 of Hedgerow Regulations 1997

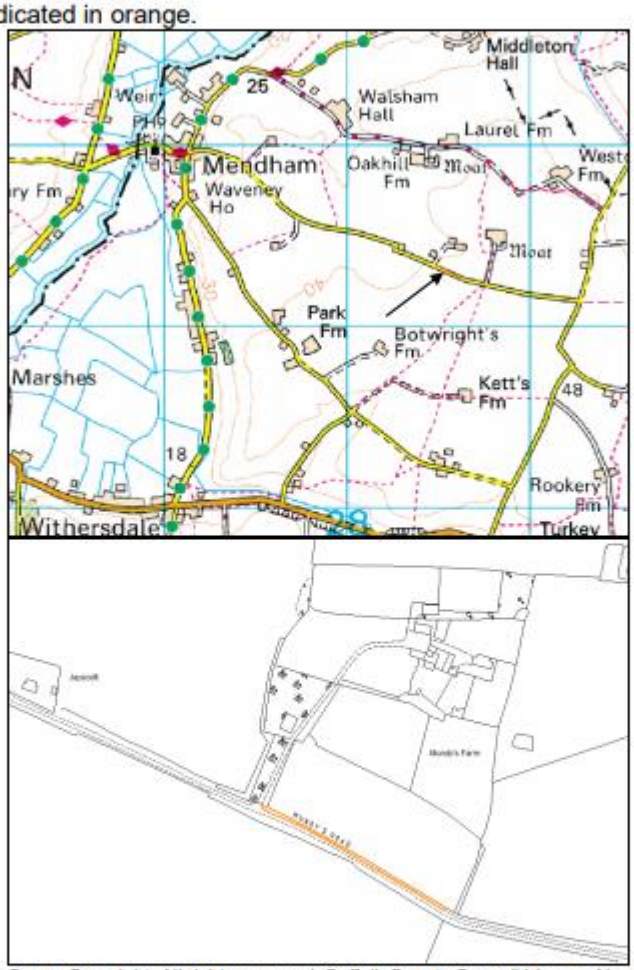
Alder *(Alnus glutinosa)*
Apple, crab *(Malus sylvestris)*
Ash *(Fraxinus excelsior)*
Aspen *(Populus tremula)*
Beech *(Fragus sylvatica)*
Birch, downy *(Betula pubescens)*
Birch, silver *(Betula pendula)*
Black-poplar *(Pupulus nigra sub-species betulifolia)*
Blackthorn *(Prunus spinosa)*
Box *(Buxus sempervirens)*
Broom *(Cytisus scoparius)*
Buckthorn *(Rhamnus cathartica)*
Buckthorn, alder *(Frangula alnus)*
Butcher's-broom *(Ruscus aculeatus)*
Cherry, bird *(Prunus padus)*
Cherry, wild *(Prunus avium)*
Cotoneaster, wild *(Cotoneaster integerrimus/ cambricus)*
Currant, downy *(Ribes spicatum)*
Currant, mountain *(Ribes alpinum)*
Dogwood *(Cornus sanguniea)*
Elder *(Sambucus nigra)*
Elm *(Ulmus species)*
Gooseberry *(Ribes uva-crispa)*
Gorse *(Ulex europaeus)*
Gorse, dwarf *(Ulex minor)*
Gorse, western *(Ulex gallii)*
Guelder Rose *(Viburnum opulus)*
Hawthorn *(Crataegus monyogyna)*
Hawthorn, midland *(Crataegus laevigata)*
Hazel *(Corylus avellana)*
Holly *(Ilex aquifolium)*
Hornbeam *(Carpinus betulus)*
Juniper, common *(Juniperus communis)*
Lime, large-leaved *(Tilia platyphyllos)*
Lime, small-leaved *(Tillia cordata)*
Maple, field *(Acer campestre)*
Mezereon *(Daphne mezereum)*
Oak, pedunculate *(Quercus robur)*
Oak, sessile *(Quercus petraea)*
Osier *(Salix viminalis)*
Pear, Plymouth *(Pyrus cordata)*
Pear, wild *(Pyrus pyraster)*
Poplar, grey *(Populus x canescens)*
Poplar, white *(Populus alba)*
Privet, wild *(Ligustrum vulgare)*
Rose *(Rose species)*
Rowan *(Sorbus aucuparia)*
Sea-buckthorn *(Hippophae rhamnnoides)*
Service-tree, wild *(Sorbus torminalis)*
Spindle *(Euonymus europaeus)*
Walnut *(Juglans regia)*
Wayfaring-tree *(Viburnum lantana)*
Whitebeam *(Sorbus species)*
Willow *(Salix species)*
Yew *(Taxus baccata)*

CWS Number	Mid Suffolk 102
Site Name	TURKEY HALL MEADOWS
Parish	METFIELD
District	Mid Suffolk
NGR	TM290807
Description	This County Wildlife Site consists of two meadows located in front of Turkey Hall which slope gently down to the Harleston Road along the southern boundary of the site. The grassland sward supports a high diversity of flowering plants. Wild carrot, glaucous sedge, cowslip and ox-eye daisy are amongst the more common indicator plants of unimproved meadows which occur here. In addition a number of rare plants can also be found. Four species of orchid have been recorded here namely bee, common spotted, green-winged and pyramidal orchid. Of particular botanical value is the presence of spiny restharrow, a scarce plant in Suffolk which dominates large areas of Turkey Hall Meadows. The conservation value of these meadows has been maintained by a management regime of hay-cutting with some additional grazing. Herb-rich meadows are a scarce and declining habitat both regionally and nationally. Turkey Hall Meadows are therefore of high priority for conservation.
Area	1.56

CWS Number	Mid Suffolk 103
Site Name	MILL LANE
Parish	METFIELD
District	Mid Suffolk
NGR	TM294808
Description	Mill Lane is an unmetalled, ancient green lane which runs between arable fields to the north of Metfield village. The lane slopes gently down to a ford at the bottom of the valley and rises again up towards Rookery Farm. Historically, the lane was used as a route to the nearby market town of Bungay. Ancient hedges (biodiversity priority habitat) border both sides of the lane and comprise of dogwood, field maple, hawthorn, dog-rose, hazel and elm with scattered mature oak and ash. Polypody fern occurs occasionally in the base of the hedge. The grass verges of the lane include a number of indicator plants of unimproved lowland meadow grassland (biodiversity priority habitat) e.g. pepper saxifrage, pyramidal orchid and cowslip. There is also a small population of sulphur clover (nationally scarce).
Area	0.39

FACTSHEET – Mendham Roadside Nature Reserve No. 164

The RNR is indicated in orange.



Site Name and Number	Mendham 164
Is there a Warden?	Yes
Map Reference	TM 28508233 to TM 28638226
Road Number	U5803
Highways Area	Central
County Wildlife Site?	MSDC 174
RNR Area	300m^2
Road Sides (length)	North:154m
Cutting time	SEPTEMBER
Criteria	Sulphur Clover

HEALTH AND SAFETY
This is a LOW RISK site.
Please take care, and wear high visibility clothing if visiting this RNR
Volunteers are permitted to work on this RNR provided they take appropriate safety precautions

Sulphur Clover can be found on this RNR.

What is an RNR?

An RNR is a Roadside Nature Reserve. Under the Roadside Nature Reserve Scheme, the grass verges are individually managed to benefit the scarce or unusual plants or fungi growing in the stretch protected from normal highways management. RNRs may also be designated as County Wildlife Sites (CWS) and several are Sites of Special Scientific Interest (SSSIs).

RNRs are marked by two white posts, one at each end, with a black arrow on both posts pointing inwards to the RNR. This is to indicate to the grass verge cutters that this specific site is an RNR and is not to be cut outside of its designated cutting times.

Why are we conserving them?

Many roadside verges are very old, on the edges of routes that have changed little over the centuries. These verges are the remains of the semi-natural grassland that was once widespread throughout the country, but which has declined by 98% since 1945, as a result of changes of land use, intensive cultivation and drainage.

By careful management of the sites we aim to preserve the species on RNRs, giving future generations the chance to enjoy these remnants of ancient grassland meadows.

How can you help?

You can help by keeping an eye on the RNR, and letting us know if anything happens to it, such as material being dumped, or the marker posts being damaged. Even if we have a warden we might need help with raking after the grass is cut. If you would like to help out or be a RNR warden please get in touch, we will be happy to talk to you about the RNR and discuss the warden's role with you.

For further information on this RNR contact
Holly Emmens on 01473 265052
Email: ecology@suffolk.gov.uk

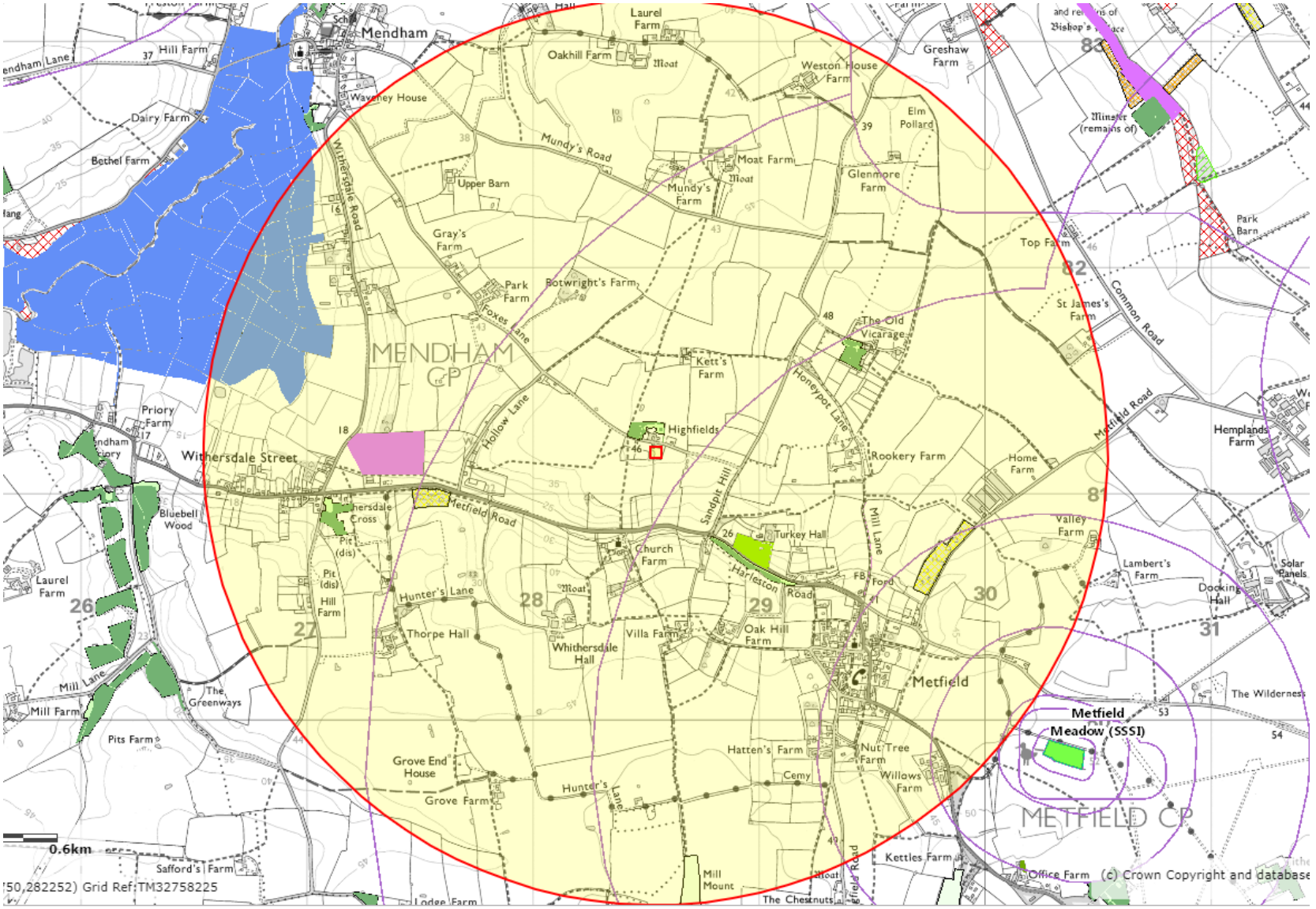

Mendham
Laurel Farm
Oakhill Farm
Moat
Weston House Farm
Greshaw Farm
Hill Farm
Dairy Farm
Bethel Farm
Waveney House
Mundy's Road
Upper Barn
Moat Farm
Mundy's Farm
Glenmore Farm
Elm Pollard
Minster (remains of)
Park Barn
Top Farm
Gray's Farm
Park Farm
Botwright's Farm
Foxes Lane
MENDHAM CP
St James's Farm
Common Road
The Old Vicarage
Kett's Farm
Honeypot Lane
Metfield Road
Hemplands Farm
Priory Farm
Withersdale Street
Hollow Lane
Highfields
Rookery Farm
Home Farm
Bluebell Wood
Sandpit Hill
Turkey Hall
Valley Farm
Lambert's Farm
Solar Panels
Docking Hall
Church Farm
Harleston Road
Mill Lane
Hunter's Lane
Thorpe Hall
Villa Farm
Oak Hill Farm
Whitherdale Hall
Laurel Farm
Mill Farm
The Greenways
Pits Farm
Metfield
Metfield Meadow (SSSI)
The Wilderness
Grove End House
Grove Farm
Hatten's Farm
Cemy
Nut Tree Farm
Willows Farm
Hunter's Lane
METFIELD CP
Kettles Farm
Mill Mount
The Chestnuts
Office Farm
Safford's Farm
Lodge Farm
0.6km
(c) Crown Copyright and database
50,282252) Grid Ref: TM32758225

Table 6.1 *Guidance on the optimal timing for carrying out specialist ecological surveys and mitigation*

This is not definitive and is intended to provide an indication only. The timing of surveys and animal activity will be dependent on factors such as weather conditions. Please consult the *species briefing sheets* for more detailed information, including species distribution.

	KEY
	Recommended survey time
	No surveys
	Mitigation conducted at these times
	Mitigation works restricted

* Where survey techniques involve the capture, handling or disturbance of *protected species* then only licensed persons can undertake surveys; personal *survey and monitoring* licences are obtained from English Nature, Countryside Council for Wales, Environment and Heritage Service (NI) or Scottish Natural Heritage

** Where mitigation involves the killing, capture, injury and/or disturbance of *protected species* and/or the damage, destruction or obstruction of their *habitats*, a *development licence* must be obtained from the Department for Food and Rural Affairs (England), Scottish Executive's Environment and Rural Affairs Department, Welsh Assembly (Countryside Division) or the Environment and Heritage Service Northern Ireland. Licences will be granted only to persons who have proven competence in dealing with the species concerned. Development licence applications take approximately *30 days* to be processed by government departments. Where mitigation works need to be conducted under licence *before* works begin, licence applications will need to be submitted considerably earlier.

		Licence required?	J	F	M	A	M	J	J	A	S	O	N	D
Habitats / vegetation	Surveys	N	Mosses and lichens. No other detailed plant surveys – Phase 1 surveys only (least suitable time)			Detailed habitat assessment surveys Surveys for higher plants and ferns Mosses and lichens in April, May and September only						Mosses and lichens. No other detailed plant surveys – Phase 1 surveys only (least suitable time)		
	Mitigation	N	Planting and translocation		No mitigation for majority of species							Planting and translocation		
Birds	Surveys	N	Winter birds		Breeding birds / migrant species			Breeding birds		Breeding birds / migrant species			Winter birds	
	Mitigation	N	Clearance works may be conducted at this time, but must stop immediately if any nesting birds are found		No clearance or construction works Bird nesting season					Clearance works may be conducted at this time, but must stop immediately if any nesting birds are found				
Badgers	Surveys	*	All survey methods – best time is in spring and early autumn / winter											
	Mitigation	**	Building of artificial setts No disturbance of existing setts						Stopping up or destruction of existing setts					See Jan to June
Bats	Surveys	*	Inspection of hibernation, tree and building roots			No surveys	Activity surveys and inspection of building roosts. Emergence counts.				No surveys	Inspection of hibernation, tree and building roots		
	Mitigation	**	Works on maternity roosts		Works on maternity roosts until mid-May. Works on hibernation roosts from mid-March			Works on hibernation roosts only		Hibernation roosts until November. Maternity roosts from mid-September		Works on maternity roosts only		

[1] Applies in Northern Ireland only

Table 6.1 *Guidance on the optimal timing for carrying out specialist ecological surveys and mitigation* (continued)

		Licence required?	J	F	M	A	M	J	J	A	S	O	N	D
Dormice	Surveys	*	Nut searches (sub-optimum time)		Nest searches (April sub-optimum time)		Cage traps and hair tube surveys to mid-October Nut searches from September (optimum time September to December) Nest searches (optimum time September to March)						Nut searches and nest searches (optimum time)	
	Mitigation	**	No clearance works				Clearance works (sub-optimum time)	No clearance works			Clearance works to early October (optimum time)		No clearance works	
Otters	Surveys	*	Surveys for otters can potentially be conducted all year round, though vegetation cover and weather conditions may limit the times at which surveys can be carried out											
	Mitigation	**	Mitigation can potentially be conducted in any month, but is likely to be restricted where otters are found to be breeding											
Pine martens	Surveys	*	Surveys may be conducted all year round weather permitting Optimum time is spring and summer. Surveys for breeding dens from March to May.											
	Mitigation	**	Works in areas of pine marten habitat and dens		Avoid all works in pine marten habitat								Works in areas of pine marten habitat and dens	
Red squirrels	Surveys	*	Surveys may be conducted all year round weather permitting Optimum time is spring and summer. Surveys for breeding females from December to September.											
	Mitigation	**	Avoid all works in red squirrel habitat									Works should preferably be conducted at this time		Avoid all works in red squirrel habitat
Water voles (n/a in NI)	Surveys	*	Reduced activity	Initial surveys possible	All survey methods can be used during this period, though vegetation cover and weather conditions may limit the times at which surveys can be carried out. (Optimum time: March to June)								Initial surveys possible	Reduced activity
	Mitigation	N[2]	Avoid all works in water vole habitat		Works in water voles habitat possible		Avoid all works in water vole habitat			Works in water vole habitat possible		Avoid all works in water vole habitat		
Sand lizards, smooth snakes (n/a in NI) [1]and common lizards	Surveys	*	No surveys – reptiles in hibernation		Activity surveys from March to June and in September / October. Surveys are limited by high temperatures during July and August. Peak survey months are April, May and September.								No surveys – reptiles in hibernation	
	Mitigation	**	Scrub clearance		Capture and translocation programmes can only be conducted whilst reptiles are active (March to June and September / October). Trapping is limited by high temperatures during July / August. Scrub clearance								Scrub clearance	

[2] The extent of legal protection of the water vole is currently under review; it has been proposed to fully protect water voles, as well as their habitats.

Table 6.1 *Guidance on the optimal timing for carrying out specialist ecological surveys and mitigation* (continued)

		Licence required?	J	F	M	A	M	J	J	A	S	O	N	D
Other reptiles	Surveys	N	No surveys – reptiles in hibernation		Activity surveys from March to June and in September / October. Surveys are limited by high temperatures during July and August Peak survey months are April, May and September.								No surveys – reptiles in hibernation	
	Mitigation	N	Scrub clearance		Capture and translocation programmes can only be conducted whilst reptiles are active (March to June and September / October). Trapping is limited by high temperatures during July / August Scrub clearance								Scrub clearance	
Great crested newts (n/a in NI)	Surveys	*	No surveys – newts in hibernation		Pond surveys for adults: mid-March to mid-June. Surveys must include visits undertaken between mid-April and mid-May. Egg surveys April to mid-June. Larvae surveys from mid-May Terrestrial habitat surveys				Larvae surveys to mid-August Terrestrial habitat surveys		Terrestrial habitat surveys		No surveys – newts in hibernation	
	Mitigation	**	No trapping of newts Pond management only		Newt trapping programmes in ponds and on land				Newt trapping on land only				No trapping of newts Pond management only	
Natterjack toads	Surveys	*	No surveys - toads in hibernation			Surveys of breeding ponds for adults. Surveys for tadpoles from May onwards. Surveys for adults on land				Surveys for adults on land.		No surveys – toads in hibernation		
	Mitigation	**	Pond management works			Trapping of adults in ponds from April to July. Trapping of adults on land Trapping of tadpoles from May to early September						Pond management works		
White-clawed crayfish	Surveys	*	Reduced activity			Surveys can be undertaken	Avoid surveys (females are releasing young)			Optimum time for surveys			Reduced activity	
	Mitigation	***	Avoid capture programmes (low activity levels may lead to animals being easily missed)			Exclusion of crayfish from construction areas.	Avoid capture programmes			Exclusion of crayfish from construction areas			Avoid capture programmes (low activity levels may lead to animals being easily missed)	
Fish	Surveys	*	For coastal, river and stream-dwelling species, the timing of surveys will depend on the migration pattern of the species concerned Where surveys require information on breeding, the timing of surveys will need to coincide with the breeding period, which may be summer or winter months, depending on the species											
	Mitigation	**	Mitigation for the protection of watercourses is required at all times of year. Mitigation for particular fish species will need to be timed so as to avoid the breeding season. This varies from species to species.											

*** Where mitigation involves the capture of white-clawed crayfish, a mitigation licence must be obtained from English Nature, Countryside Council for Wales, Environment and Heritage Service (NI) or Scottish Natural Heritage. Licences will be granted only to persons who have proven competence in dealing with the species concerned.

Wildlife & Construction
Best Practice Guidance

Habitat Protection

Where retained habitat is adjacent an area of development, what should you do?

- An exclusion zone should be put in place consisting of barriers separating construction activities from wildlife areas.
- No polluting materials should be used near rivers.
- Care should be taken to prevent the introduction or spread of invasive plants such as Japanese Knotweed or Giant Hogweed.
- 'Keep out wildlife exclusion zone' signs to be secured to barriers.

Trees and Hedgerows

- The contractor should follow the specific requirements of the Local Authority in relation to Tree Preservation Orders.
- Trees should be fenced off by no less than the width of the canopy spread until all development work is complete.
- Do not use a tree for external fixtures or fittings.
- Nothing should be stored against the trunks of trees.
- There should be no change in soil depth within 2m of the trunks, unless it has been approved by an arboriculturist.
- Site Compounds should be erected outside of the tree canopy.

Phased Clearance In Relation to Reptiles and Amphibians

- Any site clearance should be undertaken in a phased and controlled manor and under ecological supervision. This gives a chance to reptiles and amphibians to move out the way to somewhere safe before a site is cleared.
- All clearance work should be undertaken during April - August in order to coincide with the reptile and amphibian active seasonal period and should be undertaken within a temperature range of 16°C - 24°C.
- Strim grass to a height of 100mm and the cut material to be hand raked to the sides of the area. All strimming should commence in the centre of the site working outwards towards the periphery of the development footprint to where the habitat is to be retained.

Protected Species

Birds and their Nests

- All species of wild bird in the UK are protected during the breeding season.
- They are protected against intentional killing, injuring or taking, damaging or destroying nests in use or being built, and taking or destroying eggs.
- Birds can nest in places, such as scrub, hedgerows, trees, in or on buildings, ledges, cliffs and on the ground, depending on the species. In the UK they typically build their nests and lay their eggs between March and the end of July.

What if you find a bird nesting on site?

- All works in the area must stop until the birds have completed breeding.
- An exclusion zone around the nest's area should be put up by an ecologist.
- **DO NOT** undertake scrub clearance during the bird-nesting season (March – end of July) if at all possible.
- **DO NOT** undertake scrub clearance during the bird-nesting season without an experienced ecological being present.

Reptiles

- Reptiles are protected, which makes it an offence to intentionally and recklessly kill, injure or take any species of reptile.

Where are they found?

- Grass snake, slow worm and common lizard are fairly widespread and may be found within dense vegetation on sites that are directly next to open areas of rubble / rocks and / or short grassland.
- Clearance works should be undertaken in a phased manor and supervised by an ecologist.

What to do if you find a reptile?

- **STOP!** If you think you have found a reptile on site, stop all works and consult an ecologist immediately.

Amphibians

- Amphibian species include the common toad, common frog, smooth (or common) newt and palmate newt, there is also the fully protected great crested newt.
- Common amphibians are protected, which makes it an offence to intentionally and recklessly kill, injure or take them. Great crested newts are further protected for disturbance and/or damaging or obstructing their habitat.

Where are they found?

- Amphibians can be found in or near ponds or other water bodies on development sites, including temporary pools. Most amphibians will hibernate on land during the winter months.

What should you do if you find an amphibian and are unsure of the identity?

- **STOP!** and consult an ecologist immediately.
- **STOP!** If you think you have found a great crested newt on site and consult an ecologist immediately.

Bats and their Roosts

- All bat species and their roosts are protected, it is an offence to intentionally kill, injure or take a bat. It is also an offence to intentionally or recklessly damage, destroy or obstruct access to any place that a bat uses for shelter or protection (even if bats are not currently present).

Places you may find them?

- Holes, and cracks in trees, in roofs and walls of houses and buildings, under bridges, in underground caves or old railway tunnels. Every building and mature tree is a potential bat roost.

Things to look out for?

- Below bat roost entrances: Dark stains on walls, tree trunks or bat droppings on the ground.
- Bat droppings are dark brown or black and about half a centimetre long - they crumble when crushed.

What should you do if you think you have found a bat roost?

- **STOP!** all works in the area and contact an Ecologist immediately.

MVV Environment
KIER URS

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Armada Way
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01752 676700
email@example.com
www.urs.com

Wildlife and Construction Best Practice Guidance

BIRDS AND THEIR NESTS

- All species of wild bird in the UK are protected during the breeding season.
- They are protected against intentional killing, injuring or taking, damaging or destroying nests in use or being built, and taking or destroying eggs.
- Birds can nest in places, such as scrub, hedgerows, trees, in or on buildings, ledges, cliffs and on the ground, depending on the species. In the UK they typically build their nests and lay their eggs between March and the end of July.
- What if you find a bird nesting on site?
- All works in the area must stop until the birds have completed breeding.
- An exclusion zone around the nest/s area should be put up by an ecologist.
- **DO NOT** undertake scrub clearance during the bird-nesting season (March – end of August) if at all possible.
- **DO NOT** undertake scrub clearance during the bird-nesting season without an experienced ecological being present.

HABITAT PROTECTION

- Where retained habitat is adjacent an area of development, what should you do?
- An exclusion zone should be put in place consisting of barriers separating construction activities from wildlife areas.
- No polluting materials should be used near rivers.
- 'Keep out wildlife exclusion zone' signs to be secured to barriers.

REPTILES AND AMPHIBIANS

- Reptiles and amphibians are protected, which makes it an offence to intentionally and recklessly kill, injure or take any species of reptile.
- Amphibians can be found in or near ponds or other water bodies on development sites, including temporary pools. Most amphibians will hibernate on land during the winter months.
- What should you do if you find an amphibian or reptile and are unsure of the identity?
- Reptiles and amphibians are fairly widespread and may be found within dense vegetation on sites that are directly next to open areas of rubble / rocks and / or short grassland.
- Clearance works should be undertaken in a phased manor and supervised by an ecologist.
- **STOP!** if you think you have found a reptile or amphibian on site, stop all works and consult an ecologist immediately.

TREES AND HEDGEROWS

- Trees should be fenced off by no less than the width of the canopy spread until all development work is complete.
- Do not use a tree for external fixtures or fittings.
- Nothing should be stored against the trunks of trees.
- There should be no change in soil depth within 2m of the trunks, unless it has been approved by an arboriculturist.
- Site Compounds should be erected outside of the tree canopy.

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Bat Conservation Trust

Artificial lighting and wildlife

Interim Guidance: Recommendations to help minimise the impact artificial lighting

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

Overview of impacts

Invertebrates

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

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

Birds

There are several aspects of changes to bird behaviour to take into account. The phenomenon of robins and other birds singing by the light of a street light or other external lighting installations is well known, and research has shown that singing did not have a significant effect on the bird's body mass regulation. However, it was felt that the continual lack of sleep was likely to be detrimental to the birds' survival and could disrupt the long-term circadian rhythm that dictates the onset of the breeding season[3]. Many species of bird migrate at night and there are well-documented cases of the mass mortality of nocturnal migrating birds as they strike tall lit buildings. Other UK bird species that are particularly sensitive to artificial lighting are long-eared owls, black-tailed godwit and stone curlew.[4]

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

[2] As above

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

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

Mammals

A number of our British mammals are nocturnal and have adapted their lifestyle so that they are active in the dark in order to avoid predators. Artificial illumination of the areas in which these mammals are active and foraging is likely to be disturbing to their normal activities and their foraging areas could be lost in this way. It is thought that the most pronounced effect is likely to be on small mammals due to their need to avoid predators. However, this in itself has a knock-on effect on those predators.

The detrimental effect of artificial lighting is most clearly seen in bats. Our resident bat species have all suffered dramatic reductions in their numbers in the past century. Light falling on a bat roost exit point, regardless of species, will at least delay bats from emerging, which shortens the amount of time available to them for foraging. As the main peak of nocturnal insect abundance occurs at and soon after dusk, a delay in emergence means this vital time for feeding is missed. At worst, the bats may feel compelled to abandon the roost. Bats are faithful to their roosts over many years and disturbance of this sort can have a significant effect on the future of the colony. It is likely to be deemed a breach of the national and European legislation that protects British bats and their roosts.

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

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

Lighting can be particularly harmful if it illuminates important foraging habitats such as river corridors, woodland edges and hedgerows used by bats. Studies have shown that continuous lighting along roads creates barriers which some bat species cannot cross[5]. It is also known that insects are attracted to lit areas from further afield. This could result in adjacent habitats supporting reduced numbers of insects, causing a further impact on the ability of light-avoiding bats to feed.

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

Recommendations

Survey and Planning

The potential impacts of obtrusive light on wildlife should be a routine consideration in the Environmental Impact Assessment (EIA) process[6]. Risks should be eliminated or minimised wherever possible. Some locations are particularly sensitive to obtrusive light and lighting schemes in these areas should be carefully planned.

In August 2013, Planning Minister Nick Boles launched the new National Online Planning Guidance Resource aimed at providing clearer protection for our natural and historic environment. The guidance looks at when lighting pollution concerns should be considered and is covered within one of the on line planning practice

[5] Stone E. L., Jones G and Harriss (2009) Street lighting disturbs commuting bats. Current Biology, 19, pp 1-5
[6] See also: Institution of Lighting Professionals – Professional Lighting Guide (PLG 04) Guidance on undertaking lighting environmental impact assessments)

guides[7]. The guide provides an overview for planners with links to documents that aim to give planners an overview of the subject through the following discussion points:

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

This can help planners reach the right design through the setting of appropriate conditions relating to performance and mitigation measures at the planning stage.

The Institution of Lighting Professionals (ILP) recommends that Local Planning Authorities specify internationally recognised environmental zones for exterior lighting control within their Development Plans[8]. In instances lacking classification, it may be necessary to request a Baseline Lighting Assessment/Survey conducted by a Lighting Professional in order to inform the classification of areas, particularly for large-scale schemes and major infrastructure projects.

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

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

Principles and design considerations

Do not

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

Avoid

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

[7] http://planningguidance.planningportal.gov.uk/blog/guidance/light-pollution/when-is-light-pollution-relevant-to-planning/

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

APPENDIX 4

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Mr. Jerry Stone

14 May 2020

Dear Jerry

Land to the South of Foxes Lane, Mendham

Planning reference DC/20/01652

We have been instructed to conduct a great crested new ("GCN") eDNA survey for the above proposed development. A preliminary ecological appraisal ("PEA") was carried out at the site and reported by Eco-Check in November 2019. The report recommended great crested newt presence/absence surveys to inform the appropriate mitigation for the proposed development.

Method

An eDNA survey was conducted on ponds one and two (Figure 1) on the 1 May 2020, following the field sampling protocol provided by the Department for Environment, Food and Rural Affairs ("DEFRA") and Biggs *et al.* (2014).

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Figure 1, two ponds sampled for eDNA. Site outline in red.

The eDNA method detects pond occupancy from GCN using traces of DNA shed into the pond environment. The water samples collected were sent to SureScreen Scientifics for laboratory analysis.

The results of the analysis are defined as follows by SureScreen Scientifics:

- **Sample Integrity Check ("SIC"):** Refers to quality of packaging, absence of tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to results errors. Inspection upon receipt of sample at the laboratory. To check if the Sample is of adequate integrity when received. Pass or Fail.
- **Degradation Check ("DC"):** Analysis of the spiked DNA marker to see if there has been degradation of the kit since made in the laboratory to sampling to analysis. Pass or Fail.
- **Inhibition Check ("IC"):** PCR inhibitors can cause false results. Inhibitors are analysed to check the quality of the result. Every effort is made to clean the sample pre-analysis

however some inhibitors cannot be extracted. An unacceptable inhibition check will cause an indeterminate sample and must be sampled again.

- **Result:**
  - **Negative:** Means that GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as no evidence of GCN presence.
  - **Positive:** Means that GCN eDNA was found at or above the threshold level and the presence of GCN at this location at the time of sampling or in the recent past is confirmed.
- **Positive Replicates:** To generate the results all of the tubes from each pond are combined to produce one eDNA extract. Then twelve separate analyses are undertaken. If one or more of these analyses are positive the pond is declared positive for the presence of GCN. It may be assumed that small fractions of positive analyses suggest low level presence but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive.

The eDNA survey was undertaken by Etienne Swarts (Natural England GCN survey licence level 2 2015-19185-CLS-CLS).

Results

The laboratory tests reported a negative result, indicating that GCN are absent in the two ponds nearest to the site.

The PEA reported as follows:

"The proposed works are not expected to result in any loss of terrestrial habitats of value to GCN and no potential GCN aquatic breeding habitat will be affected by the proposed works. However, with the possibility of GCN present in the aquatic and terrestrial habitats adjacent to the proposed demolition, clearance and construction works could result in injuring or killing individual newts and a low scale loss of GCN suitable terrestrial habitat.

A precautionary approach should be adopted to clearance and construction works. This includes strimming tall vegetation, checking wood and rubble piles by hand and ring fencing building compounds. There is a Moderate risk of Great Crested Newt presence in the terrestri

al and aquatic habitats on and adjacent to the site and with records of GCN within 600m and Pond 1 having good potential for GCN."

Considering the proven absence of GCN in a pond on site which was assessed as having good theorical potential for GCN, and absence from the second nearest pond to the site, it can be concluded that GCN are highly unlikely to be present on site and that the precautionary approach outlined in the PEA will be sufficient to mitigate for the proposed development.

Let me know if there are any queries or if you need anything else at this stage.

Regards.

Yours faithfully

Etienne Swarts

B. Compt. (Hons) F. Deg. Sc. ACIEEM

greenlight
environmental consultancy

SureScreen Scientifics

Folio No. 17186
Report No. 1
Purchase Order: Bunnavista
Client: GREENLIGHT
Contact: Stevie

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), Triturus cristatus, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 09/03/2020
Date Reported: 14/03/2020
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
2147	Pond 1, Bunnavista	TM 28535 81178	Pass	Pass	Pass	Negative	0
2148	Pond 2, Bunnavista	TM 28498 81313	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us. ForensicEcology@surescreen.com

Reported by: Chris Troth **Approved by:** Sarah Evans

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Company Registration No. 03058943

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METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC: **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

DC: **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: **Presence of GCN eDNA** [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assessed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the Limit of detection.

Forensic Scientists and Consultant Engineers
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