Land West of Garstang Road, Broughton PR3 5JJ

ECOLOGICAL SURVEY AND ASSESSMENT

Updated December 2022

[ERAP (Consultant Ecologists) Ltd ref: 2021-104]

ERAP (Consultant Ecologists) Ltd
Building N2
Chorley Business and Technology Centre
East Terrace
Euxton Lane
Euxton
Chorley
PR7 6TE

Tel: 01772 750502

mail@erap.co.uk
www.erap.co.uk

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SUMMARY

Introduction and Scope

i. This ecological survey and assessment presents the ecological, biodiversity and nature conservation status of land west of Garstang Road, Broughton. The assessment was requested in connection with proposals to develop the site to housing.

ii. This report presents the results of a desktop study and data search, an extended Phase 1 Habitat Survey and a great crested newt eDNA presence / absence survey carried out in May 2021 and walkover surveys carried out in June 2021 and December 2022. The scope of survey undertaken is appropriate to identify potential ecological constraints, inform the Illustrative Masterplan, describe any mitigation required and to secure maximised opportunities for biodiversity associated with the development proposals.

Results of Survey and Assessment

iii. The approximately 2.6 hectare site comprises one field of arable land in active rotational agricultural management, bordered by margins of poor semi-improved grassland with boundary hedgerows with trees. A line of trees and shrubs is present at the northern site boundary. An area of seasonal standing water (Pond 1) is present at the south-eastern corner of the site and a ditch (Ditch 1) is present at the western site boundary. Ordnance Survey mapping identifies a pond on the western boundary, however survey of the site confirms no pond is present.

iv. Direct effects of the proposals on statutory and non-statutory designated sites for nature conservation are reasonably discounted.

v. The two hedgerows within the site are Priority Habitat, and Hedgerow 1 is classed as 'important' in accordance with *The Hedgerows Regulations 1997.* The value of the hedgerows for use by foraging bats and nesting birds is also recognised. Retention and protection of the identified Priority Habitat (or planting of compensatory native hedgerows where removal is unavoidable) is recommended and will be achieved by the proposals, refer to **Sections 5.2** and **5.5**.

vi. The wildlife corridor function provided by the hedgerows and the boundary tree lines is recognised. Protection of this green infrastructure will be achieved and enhanced by the proposals.

vii. A small area of Indian Balsam, an invasive plant species listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) was detected at the site. The proposals will secure an opportunity to achieve the control of this species and prevent further spread.

viii. Retention of the three trees (T3, T12 and T41) identified to be of 'moderate' suitability and all trees of 'low' suitability for use by roosting bats will be achieved by the proposals / Illustrative Masterplan and habitats suitable for use by foraging and roosting bats will be conserved and created at the site.

ix. The vegetation on the site margins, particularly the hedgerows and trees provide suitable habitat for nesting and foraging passerine (perching) bird species, including Priority Species. Mandatory actions to protect nesting birds during site clearance and measures to provide opportunities for nesting birds are described at **Section 5.3** and will be achieved by the proposals.

x. Best practice measures to ensure compliance with relevant wildlife legislation and for the protection of amphibians, reptiles and badger are of relevance and are described at **Section 5.3**.

xi. Appropriate survey effort and / or assessment in accordance with standard guidance, has been carried out to reasonably discount adverse effects on other relevant protected species.

Recommendations

xii. The recommendations in **Section 5.0** identify the mandatory measures and ecological recommendations to be applied to ensure compliance with relevant wildlife legislation, the National Planning Policy Framework (NPPF) and best practice.

Conclusion

xiii. It is concluded that development at the site in accordance with an appropriate site layout that takes into account the ecological recommendations is feasible and acceptable in accordance with the identified ecological considerations and relevant planning policy.

xiv. The report describes the appropriate and proportionate measures and recommendations that aim to enhance the value of the site for wildlife such as roosting bats, nesting birds and biodiversity associated with residential developments. The recommendations comprise landscape planting, habitat creation and the application of positive habitat management in the long-term to achieve measurable gains for biodiversity and compliance with the NPPF, local planning policy and best practice.

1.0 INTRODUCTION

1.1 Background and Rationale

1.1.1 ERAP (Consultant Ecologists) Ltd was commissioned by Hollins Strategic Land to carry out an ecological survey and assessment of the land west of Garstang Road, Broughton (hereafter referred to as the 'site'). The Ordnance Survey (OS) grid reference at the centre of the site is SD 52477 34687. An aerial image of the site and its surrounding habitats is appended at **Figure 1** (source image: ESRI World Imagery).

1.1.2 The assessment was requested in connection with a planning application to develop the site to residential housing with an access off Garstang Road.

1.2 Scope of Works

1.2.1 The scope of ecological works undertaken comprised:

a. A desktop study and data search for known ecological information at the site and the local area;

b. An Extended Phase 1 Habitat Survey and assessment;

c. Assessment of the ecological value of the habitats within the site with the use of the National Vegetation Classification (NVC) and the Ratcliffe criteria, as presented in *A Nature Conservation Review* (Ratcliffe, 1977);

d. Survey and assessment of all habitats for relevant statutorily protected species[1] and other wildlife including badger (*Meles meles*), great crested newt (*Triturus cristatus*), bird species, water vole (*Arvicola amphibius*) and reptiles;

e. A licensed preliminary daylight bat survey of the trees;

f. The identification of any potential ecological constraints on the proposals and the specification of the scope of mitigation and ecological enhancement required in accordance with wildlife legislation, planning policy guidance and other relevant guidance; and

g. The identification of any further surveys or precautionary actions that may be required prior to the commencement of site preparation and construction activities.

2.0 METHOD OF SURVEY

2.1 Desktop Study and Data Search

2.1.1 The following sources of information and ecological records were consulted:

a. MAGiC: A web-based interactive map which brings together geographic information on key environmental schemes and designations, including details of statutory nature conservation sites;

b. Lancashire Environmental Records Network (LERN); and

c. Lancashire Biodiversity Action Plan (BAP).

2.1.2 In addition, the results of ecological surveys carried out in 2014 and 2015 at the land to the west of the site to support an approved planning application (Land off Sandygate Lane, which is currently under construction) as presented in the *Land at Bank Hall Farm, Broughton, Lancashire PR3 5JA Ecological*

[1] In accordance with *Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and Their Impact on the Planning System* (Ministry of Housing, Communities & Local Government, 2005) developers should not be required to undertake surveys for protected species unless there is reasonable likelihood of the species being present and affected by the development.

Survey and Assessment (including Licensed Bat and Great Crested Newt Surveys) (ERAP Ltd, 2016), (hereafter referred to as the '2016 ecological survey') was consulted for background information.

2.2 Vegetation and Habitats

2.2.1 An Extended Phase 1 Habitat Survey of the site was carried out by [redacted]. on 12th May 2021. The weather was sunny with occasional light showers, light breeze (Beaufort scale 2) and 14°C at 11am. Brief walkovers of the site to check the status of the ponds were carried out on 10th May 2012 and 14th June 2021 by [redacted].

2.2.2 A walkover survey to determine the current status at the site and to validate the findings of the 2021 surveys was carried out by Victoria Burrows on the 3rd December 2022.

2.2.3 A habitat and vegetation map was prepared for the site and the immediate surrounding area, refer to **Figure 2**. The mapping is based on the Joint Nature Conservation Committee Phase 1 Habitat Survey methodology (JNCC, 2010) with minor adjustments to illustrate and examine the habitats with greater precision.

2.2.4 On site habitat mapping was assisted via use of GPS technology and QField on-site mapping software, using *ESRI world imagery*.

2.2.5 The plant species within the site boundary were determined with estimates of the distribution, ground cover, abundance and constancy of individual species. The estimation of abundance was based on the DAFOR system, where D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare, this being a widely used and accepted system employed by ecological surveyors. The terms L = Locally and V = Very were additionally used to describe the plant species distributions with greater precision.

2.2.6 Stands of vegetation and habitats were described and evaluated using the National Vegetation Classification (NVC). The NVC provides a systematic and comprehensive analysis of British vegetation and is a reliable framework for nature conservation and land-use planning.

2.2.7 Hedgerows were assessed in accordance with *The Hedgerows Regulations 1997* wildlife and landscape criteria (H.M.S.O., 1997).

2.2.8 Searches were made for uncommon, rare and statutorily protected plant species, those species listed as protected in the *Wildlife and Countryside Act 1981* (as amended) and species which are indicators of important and uncommon plant communities. Plant nomenclature follows *New Flora of the British Isles 3rd Edition* (Stace, 2010).

2.2.9 Searches were carried out for the presence of invasive species, including those listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), including Japanese Knotweed (*Fallopia japonica*), Indian Balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heracleum mantegazzianum*).

2.3 Animal Life

Badger

2.3.1 The survey area for badger covered the site (as annotated on **Figure 1**) and extended to accessible land within a radius of 50 metres from the site boundary. Private gardens / land were excluded from the survey.

2.3.2 The survey was conducted in accordance with guidance presented within *Badgers and Development* (Natural England, 2007) and *Badgers: surveys and mitigation for development projects* (Natural England, 2015).

2.3.3 The following signs of badger activity were searched for:

a. Sett entrances, e.g. entrances that are normally 25 to 35cm in diameter and shaped like a 'D' on its side;

b. Large spoil heaps outside sett entrances;

c. Bedding outside sett entrances;

d. Badger footprints;

e. Badger paths;

f. Latrines;

g. Badger hairs on fences or bushes;

h. Scratching posts; and

i. Signs of digging for food.

2.3.4 Habitats within and surrounding the site were assessed in terms of their suitability for use by foraging and sheltering badger in accordance with their known habitat preferences as detailed in current guidance and *Badger* (Roper, 2010).

Bat Species

Habitat Assessment for Commuting / Foraging Bats

2.3.5 Habitats within and adjacent to the site were assessed for their value and suitability for commuting and foraging bats in accordance with Table 4.1 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn),* (Collins, J. (ed), 2016). Reference has been made to the categories and descriptions / examples, presented below.

Table 2.1: Consideration of Suitability of Foraging and Commuting Habitat for Bats

Suitability	Commuting Habitat	Foraging Habitat
Negligible	Negligible habitat features on site likely to be used by commuting bats.	Negligible habitat features on site likely to be used by foraging bats.
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated i.e. not very well connected to the surrounding landscape by other habitat.	Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree or patch of scrub.
Moderate	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 linked to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous, high-quality habitat that is well connected to the wider landscape and is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. Habitats close to and connected to known roosts.	High-quality habitat that is well-connected to the wider landscape and is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Habitats close to and connected to known roosts.

Daylight Survey: Trees

2.3.6 A preliminary assessment of the trees within the site was conducted to assess their suitability for use by roosting bats, and to inform whether further surveys or precautionary measures are required. Each tree was searched from the ground for the presence of the following features:

Woodpecker holes, rot holes, hazard beams, other vertical or horizontal cracks or splits in stems and branches, partially decayed platey bark, knot holes, man-made holes, tear-outs, cankers in which cavities have developed, other hollows or cavities, including butt-rots, double-leaders forming compression forks

with included bark, gaps between overlapping stems or branches, partially detached Ivy (Hedera helix) with stem diameters in excess of 50mm and bat, bird or dormouse (Muscardinus avellanarius) boxes.

2.3.7 Terms used to describe any features present follow (where possible) those outlined and described in *Bat Tree Habitat Key, 2nd Edition* (Andrews, H (ed), 2013) and *Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-care and Ecology Professionals* (BTHK, 2018).

2.3.8 The requirement for further presence / absence surveys at each tree was then considered.

Bird Species

2.3.9 Bird species observed and heard during the Phase 1 Habitat Survey undertaken on 12th May 2021 (and subsequent site visits to arrange access (15th May 2021) and to carry out great crested newt eDNA presence / absence survey (17th May 2021)) were recorded.

2.3.10 Habitats throughout the site and in the immediate surrounding area were assessed for their value to roosting, feeding and nesting birds, including Priority Species, as indicated by the habitats present at the site and in the surrounding area..

Great Crested Newt

Desktop Search for Ponds

2.3.11 In accordance with current Natural England guidance (Natural England, 2020) all ponds within an unobstructed 500 metres of a site should be considered for their suitability to support breeding great crested newts. The potential of the proposed development to impact upon any great crested newt population(s) whose breeding ponds are within 500 metres must be considered.

2.3.12 The search of habitats in the wider area up to a distance of 500 metres from the site boundary revealed the presence of 19 ponds and two ditches, as detailed below.

Table 2.2: Ponds within 500 metres of the Site

Pond Reference	OS Grid Reference	Distance from Site Boundary	Location (refer to Figure 1)
Ditch 1	SD 52400 34664	1 metre	Adjacent to the western site boundary
Ditch 2	SD 52336 34411	205 metres	Within a arable field to the south west of the site boundary
Pond 1	SD 52560 34619	Within site	Within the site at the south eastern corner of the site
Pond 2	SD 52430 34511	72 metres	Within a residential garden to the south of the site
Pond 3	SD 52514 34798	3 metres	Within a residential garden to the north of the site
Pond 4	SD 52249 34274	368 metres	Within a arable field to the south west of the site boundary
Pond 5	SD 52200 34680	200 metres	Within a construction site to the west of the site
Pond 6	SD 52068 34787	336 metres	Within a High School to the north west of the site
Pond 7	SD 52695 34929	217 metres	Beyond Garstang Road to the north east of the site
Pond 8	SD 52781 35091	391 metres	Beyond Garstang Road to the north east of the site
Pond 9	SD 52876 35088	458 metres	Beyond Garstang Road to the north east of the site
Pond 10	SD 52830 34999	368 metres	Beyond Garstang Road to the north east of the site
Pond 11	SD 52883 34987	407 metres	Beyond Garstang Road to the north east of the site
Pond 12	SD 52945 34983	462 metres	Beyond Garstang Road to the north east of the site
Pond 13	SD 52964 34954	469 metres	Beyond Garstang Road to the north east of the site
Pond 14	SD 52974 34889	460 metres	Beyond Garstang Road to the east of the site
Pond 15	SD 52847 34899	340 metres	Beyond Garstang Road to the north east of the site
Pond 16	SD 52762 34878	252 metres	Beyond Garstang Road to the north east of the site
Pond 17	SD 53041 34740	485 metres	Beyond Garstang Road to the east of the site
Pond 18	SD 52996 34708	434 metres	Beyond Garstang Road to the east of the site
Pond 19	SD 53071 34571	500 metres	Beyond Garstang Road to the east of the site

Consideration of Requirement for Further Survey

2.3.13 The requirement for further survey at each pond was then assessed using the following criteria:

a. Presence of dispersal barriers to great crested newt movements between ponds and the site, as detected during the walkover survey;

b. Distance of ponds from the site, and the potential influence of the proposed development of the site on any populations of great crested newt (if present at ponds), using the Natural England rapid risk assessment tool; and

c. Presence of other ponds which may form metapopulations and/or alter the influence of the site on ponds at greater distances.

Presence of Dispersal Barriers

2.3.14 There are no significant dispersal barriers between Ponds 1 to 4 or Ditches 1 and 2 and the site.

2.3.15 Pond 5 lies within an active construction site and as reported in the 2016 ecological survey, the great crested newt eDNA presence / absence survey was negative in 2015.

2.3.16 Pond 6 is separated from the site by the construction site at the Sandygate Lane development. The great crested newt eDNA presence / absence survey for Pond 6 was negative 2015. In addition the construction site is a physical barrier to the movement of amphibian species between Pond 6 and the site.

2.3.17 Ponds 7 to 19 lie over 200 metres from the site boundary and are beyond Garstang Road. Garstang Road is a wide A-road with a cycle lane and features two sets of vertical kerbstones. As such Garstang Road is reasonably concluded to be a major barrier to the movement of amphibian species.

Scope of Further Survey and Assessment

2.3.18 Due to the distances between the site and the ponds and the presence of barriers to great crested newt movements, as identified during the Phase 1 Survey (which include a Garstang Road and existing residential developments, refer to **Figure 2,** appended), the need to further consider the potential impacts of the proposed development on great crested newt at Ponds 5 to 19 is reasonably scoped out.

2.3.19 Further assessment (i.e. Habitat Suitability Index assessment and presence / absence surveys) at Ponds 1 to 4 and Ditches 1 and 2 in terms of their suitability for use by breeding great crested newt was considered appropriate.

Habitat Suitability Index Assessment

2.3.20 Ponds 1 to 4 and Ditches 1 and 2 were assessed using the Habitat Suitability Index (HSI) (Oldham, et al., 2000) by Luke Atherton B.Sc. (Hons) M.Sc. on 12th May 2021. The ponds / ditches were examined with reference to the ten HSI scoring criteria, which are: **SI_1**: Geographical location; **SI_2**: Pond area; **SI_3**: Pond drying; **SI_4**: Water quality (as indicated by the diversity of aquatic plants and invertebrates); **SI_5**: Shade; **SI_6**: Waterfowl; **SI_7**: Fish; **SI_8**: Abundance of other ponds within a one kilometre radius; **SI_9**: Quality of terrestrial habitat; and **SI_{10}**: Macrophyte cover (i.e. aquatic and emergent plants). The survey was conducted in accordance with *ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom* (ARG UK, 2010).

2.3.21 The assessment followed guidance in relation to interpreting HSI scores, following the categorical scale shown below.

Table 2.3: Pond Habitat Suitability Index Categories

HSI Score	Pond Suitability for Great Crested Newt
<0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

Great Crested Newt Environmental DNA (eDNA) Presence / Absence Survey

2.3.22 Environmental DNA (eDNA) analysis can detect the presence or likely absence of great crested newt from pond water samples. Pond water samples were collected at the ponds on 17th May 2021 by [redacted]. under the licence of [redacted] (Natural England Class Survey Licence (Level 1) Registration Number 2015-16651-CLS-CLS).

2.3.23 The surveys were carried out in accordance with the sampling protocol presented in *Appendix 5: Technical Advice Note for field and laboratory sampling of Great Crested Newt (Triturus cristatus) environmental DNA* (DEFRA, 2014) that accompanies Defra's research project and are outlined below:

a. Twenty x 30 millilitre samples were taken from around the entire perimeter of the pond. Areas most likely to be used by great crested newt were targeted, without entering the water (where possible);

b. Prior to taking the sample the water column was gently mixed at each sampling location. Care was taken to avoid disturbing the sediment on the base of the pond;

c. Once all 20 samples were taken 15 millilitres of the total sample were pipetted into each of the six sampling tubes containing ethanol, ensuring the water in the sample bag was mixed prior to and whilst taking each of the 15 millilitre samples; and

d. The six sampling tubes were shaken to mix the sample and preservative.

2.3.24 At all times the surveyor ensured the sampling equipment avoided risk of contamination by not placing the ladle or pipet on the ground or otherwise contaminated surfaces.

2.3.25 The equipment was purchased from SureScreen Scientifics and the collected samples were returned to them for qPCR laboratory analysis.

Assessment of Terrestrial Habitat

2.3.26 An assessment of the terrestrial habitat within the site for great crested newts was conducted, as informed by the *Great Crested Newt Mitigation Guidelines* (English Nature, 2001) and the *Great Crested Newt Conservation Handbook* (Langton, et al., 2001).

2.3.27 Habitats present within the site were assessed for their value to support foraging, sheltering and hibernating great crested newt. Favourable habitats can comprise rough grassland, scrubland, woodland and sites with underground crevices or cracks, such as mammal holes, voids in tree stumps or banks, and refugia such as rock piles or dead wood.

Reptile Species

2.3.28 The site and its surroundings were assessed in terms of their suitability for use by reptile species using the important characteristics for reptiles outlined in the draft document '*Reptile Mitigation Guidelines*' (Natural England, 2011), and the *Reptile Habitat Management Handbook* (Edgar, et al., 2010). These habitat characteristics are outlined below.

Table 2.4: Important Habitat Characteristics for Reptiles

1. Location (in relation to species range)	7. Connectivity to nearby good quality habitat
2. Vegetation Structure	8. Prey abundance
3. Insolation	9. Refuge opportunity
4. Aspect	10. Hibernation habitat potential
5. Topography	11. Disturbance regime
6. Surface geology	12. Egg-laying site potential

Water Vole and Otter

2.3.29 Ditch 1 is located at the western site boundary (refer to **Figure 2**). A 177 metre long section of Ditch 1 that lies adjacent to the western site boundary) was surveyed for field signs of water vole and otter and assessed for its suitability for these protected species.

2.3.30 The survey methods detailed in *The Water Vole Mitigation Handbook* (The Mammal Society Mitigation Guidance Series) Eds. Fiona Mathews and Paul Chanin (Dean, et al., 2016), were applied and the beck and associated banks were searched for burrows, latrines, feeding remains, runs, feeding lawns, nests and footprints.

2.3.31 The otter survey was undertaken in accordance with the habitat requirements and preferences detailed in *Ecology of the European Otter. Conserving Natura 2000 Rivers, Ecology Series 10* (Chanin, 2003) and searches were made for signs of otter in accordance with *Monitoring the Otter Lutra lutra. Conserving Natura 2000 Rivers Monitoring Series No 10* (Chanin, 2003) and current Natural England guidance (Natural England, 2014). **Ditch 1** was searched for dung (spraints), tracks (footprints), feeding remains, otter slides (into water), holts (underground dens) and couches (above ground sites where otters rest during the day).

Other Wildlife

2.3.32 Evidence of other wildlife (including Priority Species) observed whilst on site (but for which specific surveys were not made) was recorded and has been included in this report where it is considered of relevance to the planning application.

2.4 Survey and Reporting Limitations

2.4.1 During the collation of the eDNA water samples at Pond 3 only 60% of the pond margin was accessible. This is not considered to be a significant limitation as, albeit the pond scores a HSI of 'poor', the areas of the pond most suitable for use by great crested newt (if present) for courtship display and egg laying were accessible and were sampled.

2.4.2 No other survey limitations were experienced.

2.4.3 All measurements within this report are approximate only, and have been either measured (using QField) or estimated whilst on site or calculated using mapping software (QGIS) or internet-based mapping services such as MAGiC and Google Earth.

2.5 Evaluation Methods

2.5.1 The habitats, vegetation and animal life were evaluated with reference to standard nature conservation criteria as described in *A Nature Conservation Review* (Ratcliffe, 1977). These are size (extent), diversity, naturalness, rarity, fragility, typicality, recorded history, position in an ecological or geographical unit, potential value and intrinsic appeal.

2.5.2 Habitats have been assessed to determine whether they meet those described in *UK Biodiversity Action Plan: Priority Habitat Descriptions* (Maddock, A (ed), 2008); these lists are used to help draw up the statutory lists of Priority Habitats, as required under Section 41 of the *Natural Environment and Rural Communities* (NERC) *Act 2006*. Where suitable, the ecological value of the habitats present has been

assessed using the terms outlined in *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018).

2.5.3 Government advice on wildlife, as set out in the *National Planning Policy Framework* (Ministry of Housing, Communities and Local Government, 2021) and associated government circulars has been taken into consideration. Legislation relating to protected species, such as those listed under Schedules 1, 5, 6 and 8 of the *Wildlife and Countryside Act 1981* (as amended) and *The Conservation of Habitats and Species Regulations 2017*, is referenced where applicable, and any impacts to protected species are evaluated in accordance with current guidance.

2.5.4 The presence of any Priority Species, as listed under Section 41 of the *Natural Environment and Rural Communities (NERC) Act 2006* is noted, and habitats are assessed in terms of their suitability and value for these species. The presence of habitats and/or species listed by the Lancashire BAP Provisional Long List has been taken into account in the evaluation of the site.

3.0 SURVEY RESULTS

3.1 Desktop Study and Data Search

Statutory Designated Sites for Nature Conservation and SSSI Impact Risk Zones

3.1.1 The site and adjacent land have no statutory designation for nature conservation.

3.1.2 The site lies within a Site of Special Scientific Interest (SSSI) Impact Risk Zone for the Newton Marsh SSSI and the overlapping Ribble Estuary SSSI and Ribble and Alt Estuary Special Protection Area (SPA) and Ramsar Site located 8.6 kilometres and 9 kilometres to the south-west of the site respectively. The SSSI Impact Risk Zone requires the Local Planning Authority to consult with Natural England on likely risks from the following development categories (Ordnance Survey, 2022):

a. *Infrastructure: Airports, helipads and other aviation proposals.*

b. *Wind & Solar Energy: Solar schemes with footprint greater than 0.5ha, all wind turbines.*

c. *Air Pollution: Livestock and poultry units with floorspace greater than 500m², slurry lagoons greater than 4000m².*

d. *Combustion: General combustion processes greater than 50megawatt energy input. Including: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis / gasification, anaerobic digestion, sewage treatment works, other incineration / combustion.*

e. *Waste: Landfill. Including: inert landfill, non-hazardous landfill, hazardous landfill.*

Non-statutory Designated Sites for Nature Conservation

3.1.3 The site and adjacent land have no non-statutory designation for nature conservation. There are no non-statutory designated sites / Biological Heritage Sites (BHS) within a 2 kilometre radius of the site boundary.

Priority Habitats Inventory and Soilscape Information

3.1.4 The Priority Habitats Inventory[2] was checked via MAGiC Maps. No Priority Habitats are identified within the site boundary.

3.1.5 In accordance with *Soilscape (England)* as presented on MAGiC Map (National Soil Resources Institute, 2005), the site supports '*Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey*

[2] A spatial dataset that describes the geographic extent and location of Natural Environment and Rural Communities Act (2006) Section 41 habitats of principal importance.

soils', and the characteristic semi-natural habitats associated with the soils comprise '*Lowland seasonally wet pastures and woodlands'*.

Protected and Notable Species

3.1.6 LERN hold six records of protected and notable species for the site. The records comprise 5 records of great crested newt at Pond 1 and one record of smooth newt in 2015 (recorded by ERAP Ltd in connection with the Sandygate Lane consented development (ERAP Ltd, 2016)).

3.1.7 Records of protected and notable species for a 2 kilometre radius of the site are summarised below.

Table 3.1: Records of Protected Species Within a 2 Kilometre Radius of the Site

Taxon Group	Species Name and Designations[1] and Notes
Amphibians	Great crested newt (*Triturus cristatus*): EPS, WCAs5, PS & LBAP. 138 records, dated between 1999 and 2018, the closest of which is recorded at Pond 1 in 2015 (ERAP Ltd's record of a small population as recorded in 2015). Common toad (*Bufo bufo*): PS & LBAP. 161 records, dated between 1991 and 2019, the closest of which is 200m from the site. Common frog (*Rana temporaria*): LBAP. 134 records, dated between 1991 and 2019, the closest of which is 140m from the site. Palmate newt (*Lissotriton helveticus*) WCAs5 (sale only): 9 records, dated between 1999 and 2015, the closest of which is 1190m from the site. Smooth newt (*Lissotriton vulgaris*) WCAs5 (sale only): 60 records, dated between 1999 and 2020, the closest of which is recorded at Pond 1 in 2015.
Birds (WCAs1)	Hobby (*Falco subbuteo*): WCAs1 & LBAP. 2 records, dated 2014 and 2016, the closest of which is 1760m from the site. Little ringed plover (*Charadrius dubius*): WCAs1 & LBAP. 2 records, dated 1997 and 1998, the closest of which is 1420m from the site. Peregrine (*Falco peregrinus*): WCAs1 & LBAP. 6 records, dated between 2012 and 2019, the closest of which is 1110m from the site. Red kite (*Milvus milvus*): WCAs1 & LBAP. 1 record, dated 2019, 1750m from the site. Whimbrel (*Numenius phaeopus*): WCAs1 & LBAP. 1 record, dated 2020, 1750m from the site. Barn owl (*Tyto alba*): WCAs1. 5 records, dated between 2012 and 2013, the closest of which is 70m from the site. Brambling (*Fringilla montifringilla*): WCAs1. 4 records, dated 2017 and 1750m from the site. Fieldfare (*Turdus pilaris*): WCAs1. 6 records, dated between 2012 and 2015, the closest of which is 400m from the site. Garganey (*Anas querquedula*): WCAs1. 1 record, dated 2014, 1640m from the site. Green sandpiper (*Tringa ochropus*): WCAs1. 3 records, dated between 2012 and 2015, the closest of which is 1230m from the site. Kingfisher (*Alcedo atthis*): WCAs1. 1 record, dated 2013, 470m from the site. Redwing (*Turdus iliacus*): WCAs1. 51 records, dated between 2012 and 2018, the closest of which is 210m from the site.

Taxon Group	Species Name and Designations[1] and Notes
Birds (PS and LBAP Species)	**PS Species Only** Lesser redpoll (*Acanthis cabaret*). **PS and LBAP Species** Cuckoo (*Cuculus canorus*), curlew (*Numenius arquata*), grasshopper warbler (*Locustella naevia*), grey partridge (*Perdix perdix*), house sparrow (*Passer domesticus*), lapwing (*Vanellus vanellus*), reed bunting (*Emberiza schoeniclus*), skylark (*Alauda arvensis*), tree sparrow (*Passer montanus*), bullfinch (*Pyrrhula pyrrhula*), dunnock (*Prunella modularis*), herring gull (*Larus argentatus*) and lesser spotted woodpecker (*Dendrocopos minor*). **LBAP Species Only** Black-headed gull (*Chroicocephalus ridibundus*), common tern (*Sterna hirundo*), grey heron (*Ardea cinerea*), kestrel (*Falco tinnunculus*), lesser black-backed gull (*Larus fuscus*), little egret (*Egretta garzetta*), meadow pipit (*Anthus pratensis*), oystercatcher (*Haematopus ostralegus*), pink-footed goose (*Anser brachyrhynchus*), raven (*Corvus corax*), shelduck (*Tadorna tadorna*), snipe (*Gallinago gallinago*), swift (*Apus apus*), wigeon (*Anas penelope*), willow warbler (*Phylloscopus trochilus*).
Reptiles	Slow-worm (*Anguis fragilis*): WCAs5, PS & LBAP. 22 records, dated between 1978 and 2019, the closest of which is 380m from the site and located in the church yard to the south-east of the site (on the opposite side of Garstang Road).
Invertebrates	**PS and LBAP Species** August thorn (*Ennomos quercinaria*), brindled beauty (*Lycia hirtaria*), brown-spot pinion (*Agrochola litura*), deep-brown dart (*Aporophyla lutulenta*), double dart (*Graphiphora augur*), figure of eight (*Diloba caeruleocephala*), garden tiger (*Arctia caja*), small heath (*Coenonnympha pamphilus*) and wall (*Lasiommata megera*). **PS Species Only** Autumnal rustic (*Eugnorisma glareosa*), beaded chestnut (*Agrochola lychnidis*), blood-vein (*Timandra comae*), centre-barred sallow (*Atethmia centrago*), cinnabar (*Tyria jacobaeae*), dark-barred twin-spot carpet (*Xanthorhoe ferrugata*), dot moth (*Melanchra persicariae*), dusky brocade (*Apamea remissa*), dusky dart (*Euxoa tritici*), dusky thorn (*Ennomos fuscantaria*), ear moth (*Amphipoea oculea*), ghost moth (*Hepialus humuli*), green-brindled crescent (*Allophyes oxyacanthae*), grey dagger (*Acronicta psi*), haworth's minor (*Celaena haworthii*), heath rustic (*Xestia agathina*), knot grass (*Acronicta rumicis*), large wainscot (*Rhizedra lutosa*), latticed heath (*Chiasmia clathrata*), mottled rustic (*Caradrina morpheus*), mouse moth (*Amphipyra tragopoginis*), oak hook-tip (*Watsonalla binaria*), oblique carpet (*Orthonama vittata*), powdered quaker (*Orthosia gracilis*), rosy rustic (*Hydraecia micacea*), rustic (*Hoplodrina blanda*), september thorn (*Ennomos erosaria*), shaded broad-bar (*Scotopteryx chenopodiata*), small phoenix (*Ecliptopera silaceata*), small square-spot (*Diarsia rubi*), spinach (*Eulithis mellinata*) and white ermine (*Spilosoma lubricipeda*). **LBAP Species Only** Dusky-lemon sallow (*Cirrhia gilvago*), crescent groundling (*Teleiodes luculella*), dark fleabane neb (*Apodia bifractella*), dusky groundling (*Aroga velocella*), gold spangle (*Autographa bractea*), golden-rod brindle (*Xylena solidaginis*), hawthorn argent (*Argyresthia bonnetella*), lunar hornet moth (*Sesia bembeciformis*), puss moth (*Cerura vinula*), sloe pug (*Pasiphila chloerata*), striped wainscot (*Mythimna pudorina*) and triple-spotted pug (*Eupithecia trisignaria*).

Taxon Group	Species Name and Designations[1] and Notes
Terrestrial Mammals	Bats (*Chiroptera*): EPS, WCAs5 & LBAP. 5 records, dated between 1995 and 2013, the closest of which is 400m from the site. Brown long-eared bat (*Plecotus auritus*): EPS, WCAs5, PS & LBAP. 13 records, dated between 2013 and 2019, the closest of which is 330m from the site. European otter (*Lutra lutra*): EPS, WCAs5, PS & LBAP. 10 records, dated between 2012 and 2019, the closest of which is 410m from the site. Noctule bat (*Nyctalus noctula*): EPS, WCAs5, PS & LBAP. 12 records, dated between 2013 and 2019, the closest of which is 390m from the site. Soprano pipistrelle (*Pipistrellus pygmaeus*): EPS, WCAs5, PS & LBAP. 5 records, dated between 2009 and 2015, the closest of which is 460m from the site. Unidentified bat (*Myotis*): EPS, WCAs5 & LBAP. 4 records, dated between 2012 and 2019, the closest of which is 1430m from the site. Daubenton's bat (*Myotis daubentonii*): EPS, WCAs5 & LBAP. 1 record, dated 2013, 440m from the site. Pipistrelle (*Pipistrellus pipistrellus*): EPS, WCAs5 & LBAP. 106 records, dated between 1993 and 2019, the closest of which is 360m from the site. Eurasian badger (*Meles meles*): PBA. 4 records, 3 records are undated and 1 is from 2013, the closest of which is 150m from the site. Brown hare (*Lepus europaeus*): PS & LBAP. 11 records, dated between 1973 and 2016, the closest of which is 60m from the site. Polecat (*Mustela putorius*): PS & LBAP. 1 record, dated 2012, 1400m from the site. West European hedgehog (*Erinaceus europaeus*): PS & LBAP. 14 records, dated between 1990 and 2020, the closest of which is 770m from the site.
[1]Key to Designation Codes: EPS = European Protected Species under the *Conservation of Habitats and Species Regulations 2017.* WCAs1 = Species receives full protection under Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended). WCAs5 = Species receives full protection under Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended). PBA92 = Protection of Badger Act 1992. PS = Priority Species listed under Section 41 of the NERC Act 2006. LBAP = Species listed on the Lancashire Biodiversity Action Plan Provisional Long List.	

3.1.8 The presence of these protected and notable species within the wider area has been taken into account throughout this report.

3.2 Vegetation and Habitats

General Description

3.2.1 The approximately 2.6 hectare site located to the south of Broughton village on the northern outskirts of Preston. The site comprises one field of arable land in active agricultural management / rotation, bordered by margins of poor semi-improved grassland with boundary hedgerows with trees. A line of trees and shrubs is present at the northern site boundary. An ephemeral pond (Pond 1) is present at the south-eastern corner of the site and a ditch (Ditch 1) is present at the western site boundary.

3.2.2 Beyond the northern site boundary is a footpath and cycleway (the Guild Wheel) and residential gardens. The eastern site boundary is defined by Hedgerow 2 which extends parallel to Garstang Road. The southern site boundary is defined by Hedgerow 1, beyond which lies a farm access track, further agricultural land and residential properties. The western site boundary is defined by an extension of Hedgerow 1 beyond which lie residential properties (under construction) and agricultural land.

3.2.3 A Phase 1 Habitat Survey map is appended at **Figure 2**. Photographs are appended at **Table 8.1**.

Arable Land

3.2.4 Refer to **Photo 1**. At the time of the survey in May 2021 the field had been ploughed, tilled and seeded. The soil was devoid of vegetation. A later visit to the site on 14th June 2021 confirmed that the field had been planted to a maize crop with plastic sheet covers.

3.2.5 In December 2022 the field was occupied by a temporary Rye-grass ley with sheep grazing (refer to **Photos 21** and **22**). Consultation with the farmer confirmed that the field is currently "*a reseeded temporary ley, as part of the crop rotation for fields".*

Poor Semi-improved Grassland with Trees and Shrubs

3.2.6 Refer to **Photos 3**, **4** and **8**. A narrow margin of poor semi-improved grassland is present in the south-eastern corner of the site surrounding Pond 1 and along the south-western boundary of the site.

3.2.7 The poor semi-improved grassland is characterised by frequent and constant Perennial Rye-grass (*Lolium perenne*) and Yorkshire-fog (*Holcus lanatus*) with occasional Annual Meadow-grass (*Poa annua*), Common Bent (*Agrostis capillaris*), Lesser Celandine (*Ficaria verna*) and rare Cuckooflower (*Cardamine pratensis*) and Lesser Burdock (*Arctium minus*).

3.2.8 A cluster of semi-mature Oak (*Quercus* sp.), Lime species (*Tilia* sp.) and Sycamore (*Acer pseudoplatanus*) trees are present at the south-eastern corner of the site.

3.2.9 The area at the south-western margin of the field supports occasional Great Willowherb (*Epilobium hirsutum*), Rosebay Willowherb (*Chamerion angustifolium)* and Ramsons (*Allium ursinum*), Cleavers (*Galium aparine*) and Dandelion (*Taraxacum officinale* agg.).

3.2.10 A plant species list is appended at **Table 8.2**. The poor semi-improved grassland is characteristic of an MG7 *Lolium perenne* leys and related grasslands NVC community (Rodwell, 1992).

Hedgerow 1

3.2.11 Refer to Photos **5** and **6**. Hedgerow 1 is located along the southern and western site boundaries. It is between 1.5 – 2 metres in height, 1 – 1.5 metres in width and a total of 180 metres in length.

3.2.12 The woody vegetation is characterised by frequent and constant Hawthorn (*Crataegus monogyna*), frequent Sycamore with occasional Ash (*Fraxinus excelsior*) and Holly (*Ilex aquifolium*). Understorey herb species are characterised by frequent and constant Perennial Rye-grass and frequent Cow Parsley (*Anthriscus sylvestris*), Pendulous Sedge (*Carex pendula*) and Common Vetch (*Vicia* sativa) with occasional Forget-me-not (*Myosotis* sp.) and Bluebell (*Hyacinthoides non-scripta*).

Hedgerow 2

3.2.13 Refer to **Photo 7**. Hedgerow 2 is located along the eastern site boundary. It is 1.5 metres in height, 1 – 1.5 metres in width and a total of 180 metres in length.

3.2.14 The woody vegetation is characterised by frequent and constant Hawthorn, occasional Sycamore and Pedunculate Oak (*Quercus robur*) and rare Lime species. The understorey is characterised by frequent and constant Perennial Rye-grass and Daffodil (*Narcissus pseudonarcissus*) with occasional Bramble (*Rubus fruticosus* agg.) with rare Lords-and-ladies (*Arum maculatum*) and Hedge Mustard (*Sisymbrium officinale).*

3.2.15 A plant species list for Hedgerows 1 and 2 is appended at **Table 8.3** and a full assessment in accordance with *The Hedgerows Regulations 1997* is appended at **Table 8.4**. The hedgerows are representative of the W21 *Crataegus monogyna-Hedera helix* scrub community of the NVC (Rodwell, 1991).

Line of Trees / Young Shrubs

3.2.16 A line of mature trees and shrubs is present along the north-western and northern site boundary. The semi-mature trees are characterised by frequent Pedunculate Oak, occasional Horse-chestnut (*Aesculus hippocastanum*), Alder (*Alnus glutinosa*), Garden Privet (*Ligustrum ovalifolium*), Blackthorn (*Prunus spinosa*), Elder (*Sambucus nigra*) and Hawthorn with rare Lime species.

3.2.17 Species in the understorey comprise Ramsons, Bramble, Common Nettle, and Garlic Mustard.

Pond 1

3.2.18 At the south-eastern corner of the site is an area of lower lying land. This area was dry on 10th May 2021. Following a period of rainfall, during the site visit on 17th May 2021 a shallow (0.20 metres deep) area of open water had accumulated and this permitted a water sample to be taken for the great crested eDNA presence / absence survey. Pond was then dry again by 14th June 2021 (refer to **Photo 19**) and was dry on 3rd December 2022. The margins of the lower lying area are colonised by Floating Sweet-grass (*Glyceria fluitans*), Creeping Bent (*Agrostis stolonifera*) and Large Bittercress (*Cardamine amara*). No aquatic or emergent plant species are present to further confirm the regular drying of this area.

Ditch 1

3.2.19 Refer to **Photo 12**. Ditch 1 encroaches into the western site boundary and comprises a narrow (1 to 1.5 metre wide ephemeral ditch channel with steeply sloping (80º) earth banks. The shallow water (reported to be in dry by 14th June 2021) contains Fool's Water-cress (*Apium nodiflorum*).

Invasive Plant Species

3.2.20 A small area of Indian Balsam, an invasive plant species listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) was detected in the understorey of Hedgerow 1 on the western site boundary, refer **Photo 20** and **Figure 2**; no other invasive plant species were found.

3.3 Animal Life

Badger

3.3.1 No badger setts were detected within the site boundary or within an accessible 50 metres of the site boundary. The data search returned 3 records of badger within 500 metres of the site, all within off-site land to the south.

3.3.2 Badger footprints were detected along a mammal path from the south-eastern corner of the site to the north-eastern corner of the site in 2021. No badger hairs were detected where the pathway crossed Hedgerow 1 or the fence-line at the northern site boundary. It is advised that badger traverse the site, although no setts were found within a zone of potential impact of the development proposals. Appropriate guidance is provided in **Section 5.3**.

Bat Species

Habitat Assessment for Commuting and Foraging Bats

3.3.3 The boundary features namely the pond, hedgerows and the tree lined boundaries provide habitat connectivity around the site and are assessed to be of moderate suitability for use by foraging bats, in the context of the surrounding fields of lower suitability for use by foraging bats.

3.3.4 The arable field within the site is unlikely to provide an abundance or diversity of invertebrate prey, and is therefore considered to be of low suitability for use by foraging bats.

Trees

3.3.5 The trees identified as supporting features suitable for use by roosting bats are described below.

Table 3.2: Trees with Features Suitable for Roosting Bats

Tree Reference (Species) (Photo Reference)	Features	Category
T41(Oak) **(Photos 13 to 15)**	Split branches at 3 metres and 5 metres Knothole at 3 metres, eastern aspect	Moderate
T3 (Oak) **(Photo 16)**	Knotholes, tearouts and split branches	Moderate
T12 (Oak) **(Photo 17)**	Knothole in lateral branch in canopy	Moderate
T28 (Lime) **(Photo 18)**	Deadwood in canopy	Low
T5, T15 to T19 (Oak)	Dense Ivy	Low

Bird Species

3.3.6 Birds detected in the site in 12th and 17th May 2021 are listed in **Table 3.3**, below.

Table 3.3: Bird Species Detected on 12th May 2021 and the 17th May 2021

Scientific Name	Common Name	BOCC Status[1]	Location Seen
Anas platyrhynchos	Mallard	Amber	Pond 1
Cyanistes caeruleus	Blue tit	Green	Hedgerows 1 and 2
Erithacus rubecula	Robin	Green	Hedgerows 1 and 2
Falco tinnunculus	Kestrel	Amber	Flying over site (north to south)
Haematopus ostralegus	Oystercatcher	Amber	Feeding within the site
Motacilla alba	Pied wagtail	Green	Hedgerows 1 and 2
Prunella modularis	**Dunnock**	**Amber**	Hedgerows 1 and 2
Troglodytes troglodytes	Wren	Green	Hedgerows 1 and 2
Turdus merula	Blackbird	Green	Hedgerows 1 and 2
Turdus philomelos	**Song thrush**	**Red**	Hedgerows 1 and 2
Vanellus vanellus	**Lapwing**	**Red**	2 birds displaying above the site. 12 birds in field around Pond 4 (off-site)

[1]BOCC: Birds of Conservation Concern (Eaton, et al., 2015).
Bird species identified in **bold** are listed as Priority Species under Section 41 of the NERC Act 2006.

3.3.7 Eleven species were recorded within the habitats at the site, of these seven species (mallard, blue tit, robin, dunnock, wren, blackbird and song thrush) are identified as probable breeders with the majority of the assemblage comprising passerine species associated with the hedgerows at the site boundaries and / or the garden habitats bordering the site.

3.3.8 No evidence of the successful use of the site by nesting lapwing was detected but this species is likely to nest in the larger fields in the wider.

3.3.9 Three Priority Species were recorded including dunnock, lapwing and song thrush.

Great Crested Newt and other Amphibians

3.3.10 A Habitat Suitability Index (HSI) assessment and eDNA presence / absence survey was undertaken at Ponds 1 to 4 and Ditches 1 and 2. The results are given below.

Table 3.4: Habitat Suitability Index Assessment and eDNA results for Ponds 1 to 4 and Ditches 1 and 2

Pond Reference	HSI Assessment Result (refer to Table 8.5)	eDNA Presence / Absence Result 2021 (refer to Appendix 2)
Pond 1 (**Photo 8**)	Poor	Negative
Pond 2 (**Photo 9**)	Average	Negative
Pond 3 (**Photo 10**)	Poor	Negative
Pond 4 (**Photo 11**)	Poor	Negative
Ditch 1 (**Photo 12**)	Below Average	Negative
Ditch 2	Poor	Negative

3.3.11 The great crested newt eDNA presence / absence survey was negative for Ponds 1 to 4 and Ditches 1 and 2 in 2021.

Reptiles

3.3.12 Debris in the south-western corner of the field suitable for sheltering and basking reptiles was examined during the survey; no reptile species were detected. As confirmed at **Table 3.1** there are records of slow-worm in the local area but none in areas with direct habitat connectivity to the site. Slow-worm have not been identified to be present at the consented site bordering the site.

3.3.13 The arable field provides limited opportunity for sheltering slow-worm. The hedgerow understoreys and field margins provides some opportunities for use by slow-worm, if present. As such, in the instance, the reasonable avoidance measures described at **Section 5.3** are considered to be appropriate and proportionate to the baseline conditions and the potential impact of the proposals.

Water Vole and Otter

3.3.14 No water vole or field signs to indicate the presence of water vole and otter was detected at Ditch 1 or Pond 1 (within the site). The ditch is not connected to a wider network of drains or watercourses which may indicate that the species will visit the site. Adverse effects on water vole and otter are reasonably discounted.

Other Wildlife

3.3.15 The hedgerows are suitable for use by hedgehog (a Priority Species) known to be present in the local area (as confirmed by the data search, refer to **Table 3.1**).

3.3.16 Brown hare (a Priority Species) is reported to be present in the local area (refer to **Table 3.1**). No incidental observations of brown hare were recorded at the site during the visits in May 2021 and June 2021.

4.0 EVALUATION AND ASSESSMENT

4.1 Introduction and Description of Proposals

4.1.1 It is proposed to develop the site to housing, associated roads and hard standing and Sustainable Urban Drainage System (SuDS), refer to the *Illustrative Masterplan* (Hollins Strategic Land, 2021)

4.1.2 Ecological guidance, based on the baseline surveys, has been provided to the design team throughout the preparation of the Illustrative Masterplan. This approach has ensured that the layout (and the open space proposals) have, as much as possible, been ecology-led to achieve a sympathetic scheme which avoids features of ecological interest (where possible) and seeks to minimise and mitigate adverse effects where avoidance is not possible.

4.1.3 **Section 4.2** provides an assessment of any impacts of the proposed development on the designated sites for nature conservation present in the wider area. The ecological value of habitats within the site are evaluated at **Section 4.3**, and protected and notable species are considered at **Section 4.4**.

4.2 Designated Sites for Nature Conservation

4.2.1 The habitats at the site are not complementary to any of the features of interest at the statutory designated sites in the wider area and the relatively small and enclosed field unit close to a road provides limited opportunities for the site to provide functionally linked land for use by the bird species of interest associated with the designated sites. The site is sufficiently distant from has no habitat or hydrological connectivity to any designated sites to consider that direct and indirect adverse impacts of the proposals on designated sites are reasonably discounted.

4.2.2 During the planning consultation on the consented Sandygate Lane development site to the west, no impact to the SSSI/ designated sites was identified by the relevant statutory authorities.

4.3 Vegetation and Habitats

4.3.1 No survey evidence / plant species were identified to indicate that the site is representative of the Arable Field Margins Priority Habitat. As the site is in active rotational agricultural management, for the purposes of this assessment, the field is classified as arable / temporary ley (rather than permanent grassland).

4.3.2 The two hedgerows within the site are Priority Habitat, and Hedgerow 1 is classed as 'important' in accordance with *The Hedgerows Regulations 1997* owing to the presence of Bluebell only. The value of the hedgerows and associated trees and the tree line along the northern boundary for use by foraging bats and nesting birds is also recognised. Retention and protection of the identified Priority Habitat (or planting of compensatory native hedgerows where removal is unavoidable) is recommended and will be achieved by the proposals, refer to **Sections 5.2** and **5.5**. For example, a section of Hedgerow 2 will be unavoidably removed to facilitate access this loss will be more than compensated for by the new hedgerow planting of native species at the site.

4.3.3 No other habitats within the site are representative of semi-natural habitat and / or Priority Habitat. The NVC communities present are typical of the geographical area and conditions present.

4.3.4 In terms of each habitat's importance in a geographical context[3], the hedgerows, mature trees and the tree-line at the northern site boundary are of 'local' importance as the support habitats of value to nesting birds and foraging birds and bats, and will contribute to wildlife links across the wider area. Pond 1 is also of 'site' value owing to its limited persistence (with potential value for enhancement).

4.4 Protected Species and Other Wildlife

Badger

4.4.1 Significant adverse effects on badger are reasonably discounted. Best practice measures for the protection of badger during construction and the creation of opportunities for foraging badger as part of the proposals are described in **Sections 5.3 and 5.5**.

Bats

4.4.2 Retention of the three trees (T3, T12 and T41) at the site boundary identified to be of 'moderate' suitability and all trees with 'low' suitability for use by roosting bats will be achieved by the proposals.

[3] In relation to its geographic context, using the terms presented at Section 4.7 of *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018), i.e. International and European, National, Regional, Local Authority-wide area, River Basin District, Estuarine system/Coastal cell or Local. The term 'site' value is additionally used to highlight ecological features considered to be of importance in the context of the wider site habitats, but which of negligible value on the context of the local area.

4.4.3 The retention and conservation of the site boundary features comprising the hedgerows and trees, the creation of a new wildlife pond and the creation of greenspaces and gardens described in **Section 5.2** will conserve opportunities at the site for the attraction of foraging bats. The retention of these features with an appropriate buffer and the sensitive use of lighting at the developed site will avoid any significant adverse effect on opportunities for foraging bats. In addition, the built development will secure the creation for roosting bats as part of good design, refer to **Section 5.4**.

Nesting Birds

4.4.4 The hedgerows, trees and shrubs on the site boundaries provide suitable habitat for nesting and foraging passerine (perching) bird species, including Priority Species such as dunnock and song thrush. The Illustrative Masterplan aims to conserve and protect these habitats (and expand the area and opportunities available for nesting passerine birds). Mandatory actions to protect nesting birds during site clearance / unavoidable hedgerow removal and measures to provide compensatory and enhanced opportunities for nesting birds are recommended at **Sections 5.4** and **5.5**.

Great Crested Newt and Amphibians

4.4.5 The great crested newt eDNA presence / absence survey was negative for Ponds 1 to 4 and Ditches 1 and 2 (i.e. all ponds within an unobstructed 500 metres radius of the site) in 2021.

4.4.6 It is recognised that a small population (peak count of 2 great crested newt detected by torchlight survey only) was detected at Pond 1 in 2015 (ERAP Ltd, 2016). Pond 1 is an ephemeral pond (which was dry on 10th May 2021 (in shallow water on 17th May 2021 to enable a water sample for the eDNA presence / absence survey to be undertaken and was dry again by 14th June 2021). Whilst it is accepted that great crested newt can live in terrestrial habitats for a number of years, owing to the ephemeral conditions at Pond 1, it is unlikely that breeding has been successful in 2021 and in recent years (the newt larvae retain their gills until late summer and therefore ponds needs to remain in water at least 2 of every 3 years to ensure successful breeding).

4.4.7 Further, the most recent great crested newt record is dated 2015, in accordance with current Natural England guidance (Natural England, 2020), the 2015 data are obsolete and the 2021 survey data (which includes the survey of ponds with connectivity to Pond 1[4]) should be relied on to inform this planning application.

4.4.8 In addition, the terrestrial habitats at the site and those likely to affected by the development proposals (in accordance with the Illustrative Masterplan) comprise arable farmland that provides limited opportunities for sheltering great crested newt.

4.4.9 Therefore, and in consideration of the presence of the reasonable avoidance measures as described at **Section 5.3**, adverse impacts on great crested newt and their habitats are reasonably discounted.

Other Protected Species

4.4.10 Appropriate survey effort and / or assessment in accordance with standard guidance, has been carried out to reasonably discount adverse effects on other relevant protected species and Priority Species.

5.0 RECOMMENDATIONS AND ECOLOGICAL ENHANCEMENT

5.1 Introduction

5.1.1 Ecological guidance, based on the baseline surveys, has been provided to the design team throughout the preparation of the Illustrative Masterplan and planning application.

[4] If a remnant great crested population was associated with Pond 1 it would be feasible, based on the presence of habitat connectivity for the newts to migrate to Ponds 2 , 3 and Ditch 1. However the eDNA surveys at these ponds were also negative for great crested newt in 2021.

5.1.2 The recommendations and guidance provided in this section follows 'The Mitigation Hierarchy' (i.e. avoid, mitigate, compensate), as advised by the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021), to aim to ensure that the development is implemented in accordance with relevant wildlife legislation, Natural England guidance, the principles of the NPPF, relevant local planning policy and best practice.

5.1.3 This approach has ensured that the Illustrative Masterplan has, as much as possible, been ecology-led to achieve a sympathetic scheme which avoids features of ecological interest (where possible) and seeks to minimise and mitigate adverse effects where avoidance is not possible.

5.1.4 Opportunities to enhance the ecological interest and habitat connectivity and seek biodiversity gain through appropriate landscape planting and habitat creation and management have been identified, as required by the NPPF and other relevant planning documents.

5.2 Recommendations in Relation to the Illustrative Masterplan and Design

5.2.1 The following recommendations were provided to the design team:

a. Retain and protect the trees and hedgerows. Accommodate new native hedgerow planting to compensate for sections of hedgerow to be removed to accommodate road junctions and accesses;

b. Retain trees identified to support features with suitability for use by roosting bats;

c. Maximising the green infrastructure and green links through the site with the use of landscape planting and accommodation of trees as stepping stones;

d. Arrange and align properties to create contiguous gardens;

e. Align properties to front on to areas of retained, enhanced and created habitat such as the areas of public open space to minimise the risk of adverse impact associated with garden extensions and fly tipping;

f. Excavation of a new wildlife pond at the southern margin of the site;

g. Design and implementation of an appropriate and sensitive lighting strategy to avoid any adverse effects on wildlife such as foraging bats, including the avoidance of lighting where not required;

h. Maximise the use of native trees and shrubs within the proposed landscape buffer at the southern and western site boundaries;

i. Landscape planting within the residential development to be composed of native species and species such as fruit trees known to be of value for the attraction of wildlife;

j. Incorporation of features for wildlife such as boxes for roosting bats and nesting birds within the developed areas of the site; refer to **Section 5.4**; and

k. Ensure the developed areas of the site are permeable to wildlife such as hedgehog (a Priority Species) by the installation of lifted gates and plot boundary fences and / or the accommodation of gaps to permit the passage of wildlife beneath, refer to **Insert 1**.

Insert 1: Wildlife access gaps

5.3 Protection of Existing Features During Construction and Construction Environment Management Plan (CEMP) for Biodiversity

Introduction

5.3.1 To inform the site preparation and construction activities it is recommended that a Construction Environment Management Plan (CEMP) for Biodiversity is prepared and implemented. The CEMP for Biodiversity will describe the following actions / measures:

Lighting

5.3.2 Paragraph 185, bullet point 'c' in Chapter 15 (conserving and enhancing the natural environment) of the NPPF states that development should:

'limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'

5.3.3 Any lighting to be used during the construction phase must involve the use of appropriate products and screening, where necessary, to ensure no excessive artificial lighting shines over the retained habitats as lighting overspill may deter use by wildlife such as foraging bats.

Protection of Existing Vegetation

5.3.4 During the construction phase, temporary protective demarcation fencing will be used to protect the pond, trees, hedgerows and shrubs to be retained. The fencing will be in accordance with BS5837:2012 *Trees in Relation to Design, Demolition and Construction: Recommendations* (BSI, 2012).

Protection of Water Quality

5.3.5 The water quality of Pond 1 and Ditch 1 will be protected during the construction operations through the implementation of best practice. In the absence of any updated guidance, the following Pollution Prevention Guidelines (PPG) will be adhered to:

a. PPG1: Basic good environmental practices (Environment Agency, 2013);

b. PPG5: Works in, near or over watercourses (Environment Agency, 2014);

c. PPG6: Construction and demolition sites (Environment Agency, 2012); and

d. PPG7: Operating refuelling sites (Environment Agency, 2011).

Invasive Plant Species

5.3.6 Works near the stand of Indian Balsam (an invasive species listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended)) will need to be carried out under an appropriate Invasive Plant Species Management Plan.

Guidance in Relation to Bats and Trees

5.3.7 It is feasible to retain all trees identified to support potential roost features. If, for arboricultural reasons the trees need to be crown lifted / pruned, the method outlined below is applicable. The method has been prepared in accordance with best practice, practicable guidance, consultation of the approved development proposals and Chapter 6 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn),* (Collins, J. (ed), 2016).

5.3.8 If works are required the following methods must be applied:

a. Immediately prior to felling / arboricultural works, an updated inspection of the potential roost features at the trees will be carried out by a licensed bat surveyor; and

b. Provided no current or previous evidence of use by roosting bats is found (i.e. the status quo) then trees must be section / soft felled under the supervision of a licensed bat surveyor. The licensed bat surveyor will be present to supervise the following works:

- Careful section-felling of the tree(s). The sectioning must avoid cutting through or close to any cavities / dead wood, this is likely to involve climbing the tree;
- Cut sections will be lowered to the ground with the use of ropes;
- Once on the ground, any cavities, if present, will be re-inspected by the licensed bat surveyor and guidance issued; and
- Where relevant, allow all felled sections to lie on the ground for 24 hours before snedding (removing side branches).

5.3.9 The optimum time for tree removal is between September and February inclusive.

Discovery of a Bat

5.3.10 It at any time during the works a bat is discovered or suspected all contractors must withdraw from the area and ERAP (Consultant Ecologists) Ltd (01772 750502) or Natural England must be contacted for further guidance.

Nesting Birds

5.3.11 All wild birds are protected under the *Wildlife and Countryside Act 1981* (as amended) while they are breeding. It is advised that any works such as vegetation clearance that will affect habitats suitable for use by nesting birds are scheduled to commence outside the bird nesting season. Commencement of works in the nesting season must be informed by a pre-works nesting bird survey, carried out by a suitably experienced ecologist. The bird breeding season typically extends between March to August inclusive.

Badger

5.3.12 Owing to the detected presence of badger in the wider area, during the site preparation and construction operations it is essential that the following best practice is applied:

a. No trenches must be left open overnight. Trenches or holes must be covered with a board or fitted with a means of escape (such as ramped edge or a sloping plank of timber). This will ensure that any inquisitive badger do not become trapped;

b. Any pipes must be stored with caps on (to prevent badger entry);

c. No fires must be lit at the site; and

d. Any chemicals or harmful materials must be stored so that they cannot be accessed by inquisitive badger.

Reasonable Avoidance Measures for the Protection of Amphibians and Reptiles

5.3.13 The following Reasonable Avoidance Measures (RAMs) Method Statement will be applied prior to and during the construction phase of development:

a. Between the current time and the commencement of site clearance it is recommended that the current agricultural management at the site is continued and the habitats are not permitted to grow dense or rank which may increase the opportunities for attraction of sheltering amphibians and reptiles. If this is not possible then arrangements must be made for the progressing flailing of the vegetation in the site prior to commencement if works on site;

a. All site personnel must be made aware of this RAMs Method Statement;

b. A Toolbox Talk will be provided by an ecologist to all site personnel;

c. All site personnel must be trained in the identification of amphibian and reptile species, particularly in the identification of great crested newt and slow-worm;

d. The pile of rubble / debris at the south-western corner of the site must be removed by hand and searched for amphibians / reptiles. These works are most appropriately carried out outside the amphibian and reptile dormancy period (i.e. carry out works between April and October inclusive);

e. During any vegetation clearance works all arising waste must be either removed from the area or placed in a skip to avoid the accumulation of materials that may create suitable habitat and shelter for amphibians;

f. During construction, bricks etc. must be stored on pallets or raised from the ground in another suitable manner in order that no suitable habitat for amphibians is created;

g. During construction, any holes, trenches or other pits which amphibians could fall into must be covered overnight, or have sloped banks or ramps suitable for their escape;

h. The use of chemicals (such as fertilisers and herbicides) harmful to amphibians should be avoided wherever possible;

i. If it is suspected / confirmed that a great crested newt or a reptile species has been found ERAP (Consultant Ecologists) Ltd (01772 750502) or Natural England (0300 060 6000) must be contacted immediately for further assistance;

j. No site contractors must handle a great crested newt or reptile species; and

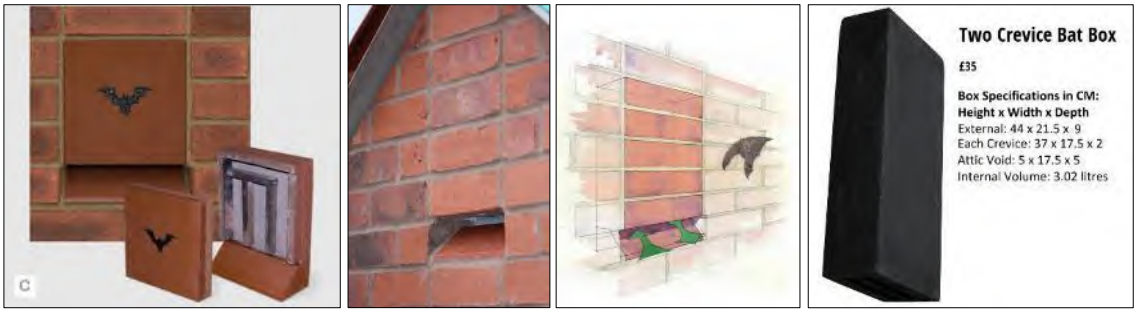
k. If any other amphibian species (such as palmate newt, smooth newt, common toad or common frog) is detected on site, it must be carefully picked up, placed in a clean bucket and moved to an area of suitable habitat beyond site boundary.

5.4 Provision of Opportunities for Roosting Bats and Nesting Birds

Enhancing Habitats for Roosting Bats

5.4.1 To enhance the opportunities at the site for roosting bats it is recommended that the development incorporates the installation of bat access panels at the new buildings.

5.4.2 The bat access panels should be sited at least four metres above ground level, ideally facing or close to areas of landscape planting or existing linear features. The access panels should not be positioned over windows or doorways where bat droppings may become a perceived nuisance. Once the development layout has been finalised, an ecologist will advise on the appropriate number and positions for the bat access panels.



Insert 2: Examples of integrated bat access panels and an externally mounted box[5]

[5] Left to right: IBstock Enclosed Bat Box 'c' (left); Habibat Bat Access Panels (centre left and centre right) and Greenwood's Ecohabitat's two crevice bat box (right). Products with a brick face are illustrated, however the Habibat bat access panels can be supplied unfaced to enable the additional of matching material.

Enhancing Habitats for Nesting Birds

House Sparrow

5.4.3 House sparrows are associated with suburban areas. Monitoring suggests a severe decline in the UK house sparrow population, estimated as halving in rural areas, and dropping by 60% in towns and cities since the mid-1970's (RSPB, 2022).

5.4.4 The installation of house sparrow terrace nest boxes is recommended at the proposed new housing. The boxes will not be positioned over windows or doorways where droppings may become a nuisance. RSPB advice states that boxes should ideally be sited facing north to east, to avoid exposure to direct sunlight, which may cause overheating of chicks in the nest. An example of a suitable house sparrow bird box is given below.

Insert 3: Schwegler 1SP House Sparrow Nesting Terrace

5.4.5 Such bird boxes are available from the NHBS (www.nhbs.com) or Wild Care (www.wildcare.co.uk). ERAP (Consultant Ecologists) Ltd will advise on the appropriate number and siting of bird boxes once the development layout has been finalised.

5.5 Enhancement of Retained Habitats, Landscape Planting and Habitat Management

Enhancement of Retained Habitats

5.5.1 The green infrastructure and wildlife corridor function of the boundary hedgerows and boundary tree line, particularly Hedgerow 1 will be complemented by the planting of a landscape buffer of native trees and shrubs such as Pedunculate Oak, Wych Elm, Cherry species, Alder, Hawthorn, Holly, Blackthorn, Hazel and Guelder Rose.

Habitat Creation within the Open Spaces

5.5.2 As identified in **Section 5.2** it is recommended that the landscape planting scheme in the areas of open space maximise use of native species and species such as fruit trees known to be of value for the attraction of wildlife.

5.5.3 The planting schedules should accommodate the maximised use of native flora and enhanced habitats such as wildflower grasslands and compensatory native hedgerow planting that includes Field Maple, Hornbeam, Hazel, Holly, Dog Rose and Honeysuckle.

5.5.4 ERAP (Consultant Ecologists) Ltd can provide input into the detailed landscape schedule, as needed.

Landscape Planting Within the Residential Site

5.5.5 It is recommended that the landscape planting within the residential site is composed from native species and species known to be of value for the attraction of wildlife. The incorporation of trees and shrubs that produce blossom and fruit which will attract insects in the landscape planting is recommended.

5.5.6 The understorey and ground cover planting design should be prepared to optimise the attraction of invertebrates such as feeding bumblebees and butterflies. Where possible the use of native species should be maximised but where necessary non-native species known to be attractive to invertebrates should be used.

5.5.7 Planting schemes that include flowering species such as *Viburnum, Ceanothus, Hebe*, *Lavandula*, *Lonicera, Potentilla, Rosmarinus* and *Vinca* can maximise opportunities for feeding invertebrates and for the attraction of foraging bats and birds.

Management Plan

5.5.8 It is recommended that a Landscape and Ecological Management Plan is prepared to identify the objectives of the habitats and describe the management prescriptions relevant to secure the longevity of the retained habitats, landscape planting and habitat creation in accordance with nature conservation targets.

6.0 CONCLUSION

6.1 It is concluded that development at the site in accordance with an appropriate site layout that takes into account the ecological recommendations is feasible and acceptable in accordance with the identified ecological considerations and relevant planning policy.

6.2 The report describes the appropriate and proportionate measures and recommendations that aim to enhance the value of the site for wildlife such as roosting bats, nesting birds and biodiversity associated with residential developments. The recommendations comprise landscape planting, habitat creation and the application of positive habitat management in the long-term to achieve measurable gains for biodiversity and compliance with the NPPF, local planning policy and best practice.

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8.0 APPENDIX 1: TABLES AND FIGURES

Table 8.1: Photographs

Photo 1: Arable land within the site (with plastic sheeting)

Photo 2: Southern site boundary and Hedgerow 1

Photo 3: Poor semi-improved grassland and rubble piles in south-western margin of the site

Photo 4: Poor semi-improved grassland and rubble piles in south-western margin of the site

Photo 5: Hedgerow 1 (facing east)

Photo 6: Hedgerow 1 (facing west)

Photo 7: Hedgerow 2 (facing north)

Photo 8: Pond 1 (taken 17th May 2021 showing shallow water)

Photo 9: Pond 2

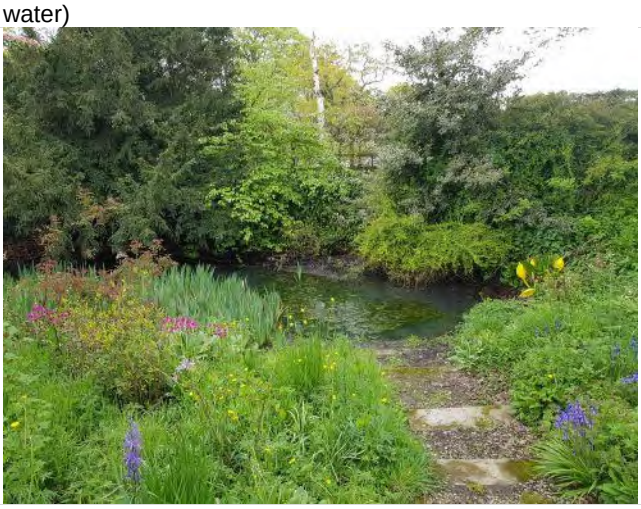

Photo 10: Pond 3

Photo 11: Pond 4

Photo 12: Ditch 1 (facing west)

Photo 13: Tree T41

Photo 14: Tree T41 showing knothole

Photo 15: Tree T41 showing dead wood

Photo 16: Tree T3 showing split branch

Photo 17: Tree T12 showing knothole

Photo 18: Tree T28 showing dead wood in canopy

Photo 19: Pond 1 (taken 14th June 2021 showing dry pond)

Photo 20: Small area of Indian Balsam at Hedgerow 1

Photo 21: Temporary Rye-grass ley on the site in December 2022 (taken from south-eastern corner of the site)

Photo 22: Sheep grazed temporary Rye-grass ley on the site in December 2022 (taken from western site boundary)

Table 8.2: Plant Species List for Poor Semi-improved Grassland at the Field Margins

Scientific Name	Common Name	DAFOR[1]	Cover
Woody Species			
Acer pseudoplatanus	Sycamore	O	2%
Aesculus hippocastanum	Horse-chestnut	O	3%
Alnus glutinosa	Alder	O	5%
Crataegus monogyna	Hawthorn	F*	25%
Fraxinus excelsior	Ash	O	3%
Ilex aquifolium	Holly	O	5%
Quercus robur	Pedunculate Oak	O	2%
Tilia sp.	Lime species	O	2%
Herb Species			
Agrostis capillaris	Common Bent	O	2%
Allium ursinum	Ramsons	O	3%
Alopecurus pratensis	Meadow Foxtail	R	<1%
Anthriscus sylvestris	Cow Parsley	O	2%
Arctium minus	Lesser Burdock	R	<1%
Cardamine pratensis	Cuckooflower	R	<1%
Chamerion angustifolium	Rosebay Willowherb	O	2%
Cirsium arvense	Creeping Thistle	R	<1%
Cirsium vulgare	Spear Thistle	R	<1%
Epilobium hirsutum	Great Willowherb	LF/O	4%
Ficaria verna	Lesser Celandine	O	3%
Galium aparine	Cleavers	O	2%
Geranium robertianum	Herb-Robert	R	<1%
Geranium sp	Non-native Crane's-bill species	R	<1%
Glechoma hederacea	Ground-ivy	R	<1%
Holcus lanatus	Yorkshire-fog	F*	15%
Hyacinthoides non-scripta	Bluebell	O	2%
Lamium maculatum	Spotted Dead-nettle	R	<1%
Lolium perenne	Perennial Rye-grass	F*	40%
Plantago lanceolata	Ribwort Plantain	O	2%
Poa annua	Annual Meadow-grass	O	3%
Prunella vulgaris	Selfheal	R	<1%
Ranunculus acris	Meadow Buttercup	O	2%
Ranunculus repens	Creeping Buttercup	O	3%
Rubus fruticosus agg.	Bramble	R	<1%
Rumex obtusifolius	Broad-leaved Dock	O	3%
Silene dioica	Red Campion	O	2%
Taraxacum officinale agg.	Dandelion	O	2%
Trifolium pratense	Red Clover	O	4%
Trifolium repens	White Clover	O	4%
Urtica dioica	Common Nettle	F*	7%
Veronica beccabunga	Brooklime	VLA	5%

[1]Key to DAFOR: D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare, V=Very, L=Local and *denotes a constant species

Table 8.3: Plant Species List for Hedgerows 1 and 2

Scientific Name	Common Name	DAFOR[1]	Cover	DAFOR[1]	Cover
Woody Species					
Acer pseudoplatanus	Sycamore	F	7%	O	10%
Crataegus monogyna	Hawthorn	F*	15%	F*	35%
Fraxinus excelsior	Ash	O	5%	-	-
Ilex aquifolium	Holly	O	5%	-	-
Quercus robur	Pedunculate Oak	-	-	O	5%
Tilia sp.	Lime species	-	-	R	2%
Ulmus glabra	Wych Elm	LF	1%	LF	1%
Understorey Species					
Allium ursinum	Ramsons	LA/F	5%	O	3%
Alliaria petiolata	Garlic Mustard	F	2%	F	2%
Anthriscus sylvestris	Cow Parsley	F	7%	O	3%
Arum maculatum	Lords-and-Ladies	-	-	R	<1%
Cardamine flexuosa	Wavy Bitter-cress	R	1%	-	-
Carex pendula	Pendulous Sedge	F	5%	-	-
Ficaria verna	Lesser Celandine	R	1%	R	<1%
Galium aparine	Cleavers	O	3%	-	-
Geranium robertianum	Herb-Robert	-	-	R	<1%
Hedera helix	Ivy	F	5%	F	7%
Holcus lanatus	Yorkshire-fog	O	3%	-	-
Hyacinthoides non-scripta	Bluebell	O	3%	-	-
Impatiens glandulifera	Indian Balsam	VLA	<1%	-	-
Lolium perenne	Perennial Rye-grass	F*	15%	F*	10%
Myosotis sp.	Forget-me-not	O	3%	-	-
Narcissus pseudonarcissus	Daffodil	-	-	F*	10%
Ranunculus repens	Creeping Buttercup	O	2%	O	3%
Rubus fruticosus agg.	Bramble	-	-	O	3%
Rumex obtusifolius	Broad-leaved Dock	R	1%	R	<1%
Sisymbrium officinale	Hedge Mustard	O	3%	R	<1%
Taraxacum officinale agg.	Dandelion	R	1%	O	3%
Urtica dioica	Common Nettle	F	5%	F	5%
Vicia sativa	Common Vetch	F	5%	-	-

[1]**Key to DAFOR:** D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare, V=Very, L=Local and *denotes a constant species

Species highlighted in grey are classed as either 'woody' or 'woodland' species contributing to *The Hedgerows Regulations 1997* wildlife and landscape criteria assessment.

Table 8.4: Hedgerow Description and Assessment in Accordance with *The Hedgerows Regulations 1997*

	Hedgerow Name	Hedgerow 1			Hedgerow 2		
Description	Height x width (metres)	1.5 – 2 x 1 – 1.5			1.5 x 1 – 1.5		
	Length (metres)	180			180		
	Continuity	95%			100%		
	Management	Flailed			Flailed		
Woody Species	Section number[1]	1	2	3	1	2	3
	Qualifying woody species	2	3	-	3	3	-
	Average Number	***3***			***3***		
Number of Features Present	(a) Bank or wall along at least ½ length	No			No		
	(b) Gaps which in agg. do not exceed 10%	Yes			Yes		
	(c)-(e) 1 standard tree per 50m	No			Yes		
	(f) At least 3 woodland species within 1m	No			Yes		
	(g) Ditch along at least ½ its length	No			No		
	(h) Connections scoring 4 points or more	No			No		
	(i) Parallel hedge within 15m	Yes			No		
	Total Features	***2***			***3***		
Hedgerow Importance	***Criteria for Hedgerow Importance 1***	***Yes (Bluebell)***			***No***		
	Criteria for Hedgerow Importance 2:	***No***			***No***		
	Criteria for Hedgerow Importance 3:	***No***			***No***		
Hedgerow Important Criteria	***Criteria for Hedgerow Importance 1:*** Hedgerow contains species listed as: (1) Part 1 of Schedule 1, Schedule 5 or Schedule 8 of *Wildlife and Countryside Act 1981* (as amended); (2) Declining breeders in 'Red Data Birds of Britain'; and / or (3) Categorised as 'endangered', 'extinct' or 'vulnerable'						
	Criteria for Hedgerow Importance 2: Hedgerow includes (Number of woody species required reduced by one in Lancashire): (i) At least 7 woody species (on average); (ii) At least 6 woody species (on average) and at least 3 features; (iii) At least 6 woody species (on average), including one of: Black Poplar, Large-leaved Lime, Small-leaved Lime or Wild Service Tree; and / or; (iv) At least 5 woody species (on average), and has 4 features						
	Criteria for Hedgerow Importance 3: Is adjacent to is adjacent to a bridleway, footpath or byway and includes at least 4 woody species on average and 2 features from (a) to (g).						
	[1]Up to and including 100 metres length = 1 section required. 100 to 200 metres length = 2 sections required Greater than 200 metres length = 3 sections required.						

Table 8.5: Habitat Suitability Index Assessment Ponds 1 to 4 and Ditches 1 and 2

Criteria	Description	Pond 1	Score	Pond 2	Score	Pond 3	Score
SI1	Location	Optimal	1	Optimal	1	Optimal	1
SI2	Pond area	15	0.05	1000	0.95	50	0.05
SI3	Pond drying	Dries annually	0.1	Never dries	0.9	Dries annually	0.1
SI4	Water quality	Poor	0.33	Moderate	0.67	Poor	0.33
SI4	Shoreline Shade	60%	1	75%	0.7	50%	1
SI6	Fowl	Minor	0.67	Minor	0.67	Minor	0.67
SI7	Fish	Absent	1	Absent	1	Possible	0.67
SI8	Pond count**	1.91	0.77	1.91	0.77	1.91	0.77
SI9	Terrestrial habitat	Poor	0.33	Poor	0.33	Moderate	0.67
SI1	Macrophytes	0%	0.3	10%	0.4	30%	0.6
Assessment Result:		**Poor**	**0.39**	**Average**	**0.70**	**Poor**	**0.43**

Criteria	Description	Pond 4	Score	Ditch 1	Score	Ditch 2	Score
SI1	Location	Optimal	1	Optimal	1	Optimal	1
SI2	Pond area	150	0.3	200	0.4	250	0.5
SI3	Pond drying	Dries annually	0.1	Dries annually	0.1	Dries annually	0.1
SI4	Water quality	Moderate	0.67	Moderate	0.67	Poor	0.33
SI4	Shoreline Shade	80%	0.6	80%	0.6	100%	0.2
SI6	Fowl	Minor	0.67	Minor	0.67	Minor	0.67
SI7	Fish	Possible	0.67	Absent	1	Absent	1
SI8	Pond count**	1.91	0.77	1.91	0.77	1.91	0.77
SI9	Terrestrial habitat	Poor	0.33	Poor	0.33	Poor	0.33
SI1	Macrophytes	20%	0.5	25%	0.55	10%	0.4
Assessment Result:		**Poor**	**0.48**	**Below average**	**0.52**	**Poor**	**0.43**

*Calculated by (SI1 x SI2 x SI3 x SI4 x SI5 x SI6 x SI7 x SI8 x SI9 x SI10)1/10.
**The number of ponds within an unobstructed one kilometre radius is divided by 3.14.

Figure 1: Aerial Image of the Site and its Surrounding Habitats and Ponds / Ditches within 500 metres

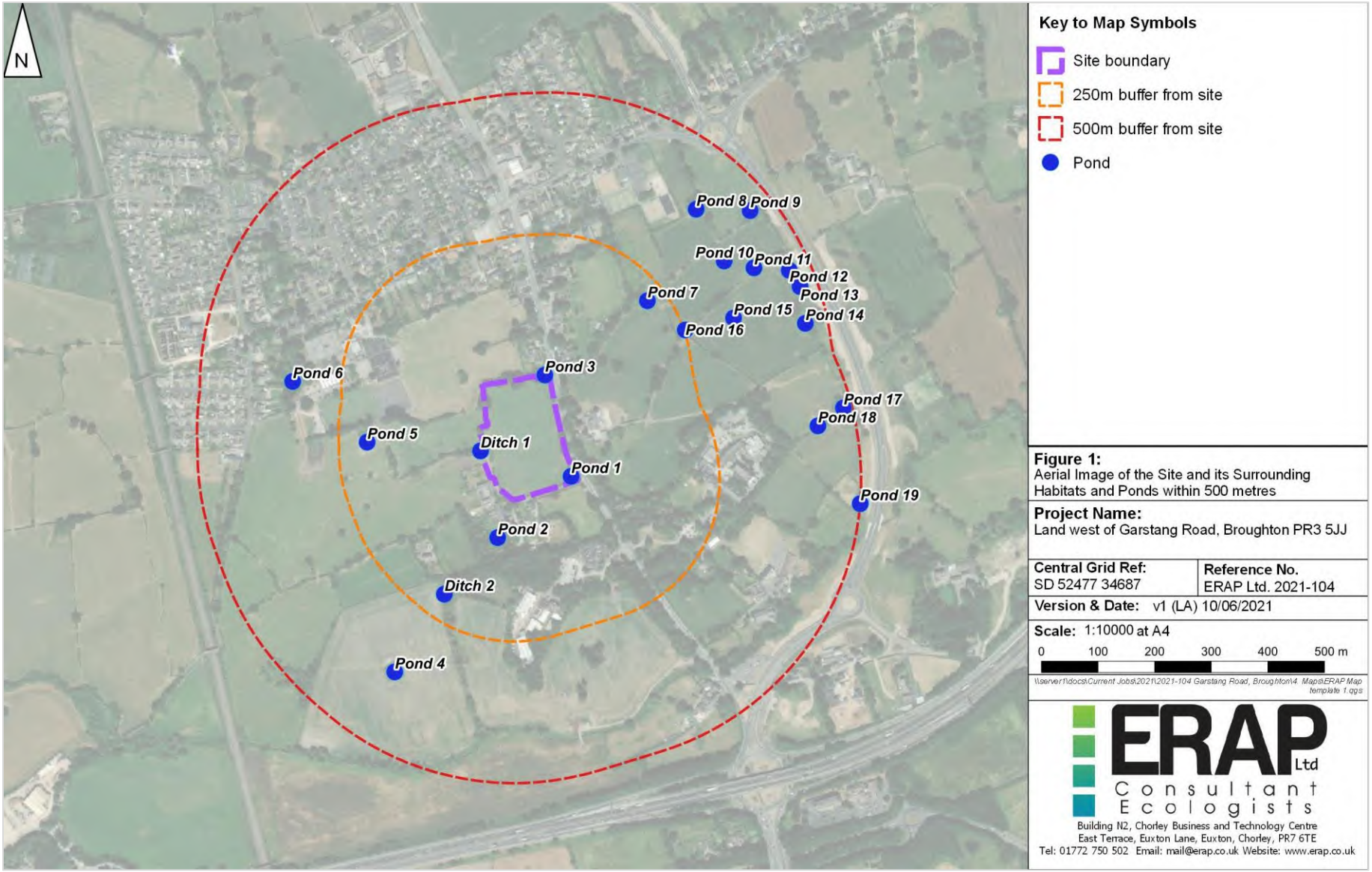

Figure 2: Phase 1 Habitat and Vegetation Map

9.0 APPENDIX 2: GREAT CRESTED NEWT EDNA PRESENCE / ABSENCE SURVEY RESULTS

SureScreen Scientifics

Folio No: E10492
Report No: 1
Purchase Order: 2021-1040
Client: ERAP LTD
Contact: [redacted]

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: 21/05/2021
Date Reported: 28/05/2021
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
5204	POND 1	SD 52560 34619	Pass	Pass	Pass	Negative	0
5205	POND 3	SD 52514 34798	Pass	Pass	Pass	Negative	0
5206	POND 4	SD 52249 34274	Pass	Pass	Pass	Negative	0
5207	DITCH 2	SD 52336 34411	Pass	Pass	Pass	Negative	0
5208	POND 2	SD 52430 34511	Pass	Pass	Pass	Negative	0
5209	DITCH 1	SD 52400 34664	Pass	Pass	Pass	Negative	0

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

Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
Company Registration No. 08950940

SureScreen Scientifics

Reported by: Chris Troth **Approved by:** Chris Troth

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 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. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result

Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
Company Registration No. 08950940

SureScreen Scientifics

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
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
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