ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company

LAND EAST OF STATION HILL, BOTLEY, CURBRIDGE, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Draft Document

September 2022

Preliminary Ecological Appraisals • Protected Species Surveys and Licensing • NVC • EcIA • HRA • Management Plans
Habitats • Badger • Bats • Hazel Dormouse • Birds • Reptiles • Amphibians • Invertebrates • Riparian and Aquatic Species

ECOSA, Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire, SO52 9DF
Tel: 02380 261065 Email: info@ecosa.co.uk Web: www.ecosa.co.uk

Registered Office: 3-4 Eastwood Court, Romsey, Hampshire, SO51 8JJ Registered in England No: 6129868
Ecological Survey & Assessment Limited is a Trinity Consultants Company

ECOSA Quality Assurance Record

This report has been produced in accordance with the CIEEM Guidelines for Ecological Report Writing 2017 (CIEEM, 2017). The Interim Ecological Assessment and report has been prepared in line with the CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018) and survey work has been undertaken in line with references within CIEEM's Source of Survey Guidance (CIEEM, 2017).

Description:	Interim Ecological Assessment Report
Produced For:	Foreman Homes Ltd
Issue:	Draft
Report Reference:	21.0095.0001.D0
Date of Issue:	14th September 2022
Date of Survey Works:	Various Dates Between April and November 2021
Author:	[redacted]
Checked by:	[redacted]
Reviewed by:	[redacted]

LAND EAST OF STATION HILL, BOTLEY,

CURDRIDGE, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT REPORT

Table of Contents

EXECUTIVE SUMMARY

Ecological Survey and Assessment Ltd (ECOSA) have been appointed by Foreman Homes Ltd to undertake ecological survey work in relation to the development of Land East of Station Hill, Botley. The site is located to the east of Botley village centre in Hampshire and comprises two grassland fields separated by a ditch. The proposals entail the development of the site for housing. This report presents the findings of the ecological survey work undertaken to date.

The main findings of the Interim Ecological Assessment are:

- The site supports the following protected species: foraging and commuting bats, otter, hazel dormouse, common species of breeding birds and a low population of slow-worm.
- The above ecological features have been identified as representing a potential constraint to the development as their legal protection prevents their killing, injury or disturbance or protects them and their habitats from harm.
- Potential mitigation measures include a sensitive lighting strategy, implementation of a CEMP and use of protection fencing during construction and sensitive working methods and timings.
- A reptile translocation will be required to remove reptiles from the construction area. An on-site or off-site receptor area will also need to be created.
- As much boundary vegetation as possible should be retained. Any hedgerow habitat which will be lost as part of the proposals should be replaced.
- Enhancement opportunities include provision of bat roosting units, a vegetated buffer along the ditch, new hedgerow planting, provision of bird nest boxes and creation of reptile hibernacula.
- The recommendations within this report should be reviewed and updated once detailed proposals are known. However, the scheme has the potential to accord with all relevant local and national planning policy.
- If the planning application boundary changes or the proposals for the site alter, a re-assessment of the scheme in relation to ecology may be required. Given the mobility of animals and the potential for colonisation of the site over time, updating survey work may be required, particularly if development does not commence within 18 months of the date of the most recent relevant survey.

1.0 INTRODUCTION

1.1 Background

Ecological Survey & Assessment Limited (ECOSA) have been appointed by Foreman Homes Ltd to undertake ecological survey work to support a planning application for the development of Land East of Station Hill, Botley, Curbridge Hampshire SO30 2HA (hereafter referred to as the site).

Lindsay Carrington Ecological Services Ltd were appointed to undertake a Preliminary Ecological Appraisal of the site in 2020 (Lindsay Carrington Ecological Services, 2020). The appraisal identified the need to carry out further survey work at the site and ECOSA were appointed to complete this work. Further surveys included bat activity surveys, otter and water vole survey, hazel dormouse survey, breeding bird surveys, reptile survey and great crested newt Habitat Suitability Index (HSI) and environmental DNA (eDNA) survey.

This report presents the findings of the species-specific survey work, evaluates the ecological value of the site to these species, identifies any potential ecological constraints to the project and provides potential mitigation/compensation measures where necessary. Possible enhancement opportunities are also presented.

1.2 The Site

The site is located in the village of Botley, Hampshire, centred on National Grid Reference (NGR) SU 5231 1294 (**Map 1**).

The site comprises two grassland fields separated by a ditch and bounded by hedgerows, trees and fencing. The site area measures approximately 11.6 hectares. A railway line and residential development is present to the north, Outlands Lane to the east, the A3051 to the south and the A334 Station Hill to the west.

The wider landscape comprises the village of Botley to the west with an open agricultural landscape to the north, east and south with areas of residential housing and the River Hamble 450 metres west.

1.3 Aims and Scope of Report

The information within this report is based on species-specific surveys carried out between April and November 2021. The objectives of the appraisal are:

- To provide baseline information on ecological features that have been identified as needing further survey work within the site's Zone of Influence and determine the importance of these features;

- To assess, characterise and quantify the effects on ecological features (based on data collected so far), including cumulative effects, and identify significant effects in the absence of any mitigation;
- To identify any mitigation measures likely to be required (based on the data collected so far), following the 'Mitigation Hierarchy'[1];
- To provide an assessment of the significance of any residual effects; and
- To outline opportunities for enhancement for biodiversity.

1.4 Site Proposals

At the time of preparing this report, detailed plans are not known. However, the proposals will entail the development of the site for housing.

[1] In accordance with CIEEM Ecological Impact Assessment guidance (CIEEM, 2018) a sequential process is adopted to address impacts on features of ecological interest, with 'Avoidance' prioritised at the top of the hierarchy and Compensation/Enhancement' at the bottom. This is often referred to as the 'mitigation hierarchy'.

2.0 PLANNING POLICY CONTEXT

2.1 Introduction

This section summarises the planning policy in relation to ecology and biodiversity within the Winchester City Council administrative area. This information is then used to make necessary make recommendations for mitigation and enhancements in order to ensure any future planning application accords with relevant planning policy.

2.2 Planning Policy

2.2.1 National Policy

The National Planning Policy Framework (NPPF) sets out the government's requirements for the planning system in England. The original document was published in 2012 with the most recent revised NPPF published in July 2021. A number of sections of the NPPF are relevant when taking into account development proposals and the environment. As set out within Paragraph 11 of the NPPF "*Plans and decisions should apply a presumption in favour of sustainable development*". However, Paragraph 182 goes on to state that "*The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.*".

The NPPF sets out that development proposals should not only minimise the impacts on biodiversity but also to provide enhancement. Paragraph 174 states that the planning system should contribute to and enhance the natural environment by *"…minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures..."*.

A number of principles are set out in Paragraph 180, including that where harm cannot be adequately avoided then it should be mitigated for, or as a last resort, compensated for. Where impacts occur on nationally designated sites, the benefits must clearly outweigh any adverse impact and incorporating biodiversity in and around developments should be encouraged. Specific reference is also made to the protection of irreplaceable habitats[2], including ancient woodland[3]. Where loss to irreplaceable habitats occurs planning permission would normally be refused unless there are wholly

[2] The NPPF defines irreplaceable habitats as "Habitats which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, taking into account their age, uniqueness, species diversity or rarity. They include ancient woodland, ancient and veteran trees, blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen."
[3] Natural England defines ancient woodland as "An area that has been wooded continuously since at least 1600 AD. It includes ancient semi-natural woodland and plantations on ancient woodland sites (PAWS)."

exceptional reasons and an adequate compensation strategy is in place. Paragraph 180 also states "*development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.*". Paragraph 181 also sets out that potential SPAs, SACs and listed or proposed Ramsar sites or sites acting as compensation for SPAs, SACs and Ramsar sites, should receive the same protection as habitat sites.

In addition to the NPPF, Circular 06/05 provides guidance on the application of the law relating to planning and nature conservation as it applies in England. Paragraph 98 states "*the presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat*". Paragraph 99 states "*it is essential that the presence or otherwise of a protected species, and the extent that they may be affected by the Proposed Project Development, is established before planning permission is granted*".

2.2.2 Local Policy

Local planning policy within Winchester City Council is provided by the Local Plan Part 1 Joint Core Strategy 2013 and the Local Plan Part 2 adopted in April 2017. A single policy makes specific reference to ecology and biodiversity within the Local Plan Part 1 Joint Core Strategy:

- **Policy CP16: Biodiversity**
  This policy refers to the protection and enhancement of biodiversity and the need for proposals to deliver net gain for biodiversity. The policy also refers to the protection of designated sites, enhancement of Biodiversity Opportunity Areas, and preventing fragmentation of the biodiversity network.

A single policy within the Local Plan Part 2 makes specific reference to landscape:

- **Policy DM24: Special Trees, Important Hedgerows and Ancient Woodlands**
  This policy refers to the long-term protection of ancient woodland and important hedgerows and trees and their setting.

The forthcoming Local Plan 2038 is currently under preparation and is anticipated to be adopted during 2023

3.0 METHODS

3.1 Introduction

This section details the methods employed as part of the species-specific surveys undertaken for the site to date. Any significant limitations to the survey methods are also considered.

3.2 Zone of Influence

To define the total extent of the study area for this appraisal (Zone of Influence[4]), the proposed scheme was reviewed to establish the spatial scale at which ecological features could be affected. The appropriate survey radii for the various elements of the appraisal (species-specific surveys) have been defined in the relevant sections below. These distances are determined based on the professional judgement of the ecologist leading the assessment, taking into account the characteristics of the site subject to assessment, its surroundings and the nature and scope of the proposals (if known when the appraisal was undertaken). Determination of the Zone of Influence is an iterative process and will be regularly reviewed and amended as the project evolves.

3.3 Scoping

Protected species considered within this appraisal are those species/species groups identified as requiring further survey work within the Preliminary Ecological Appraisal undertaken by Lindsay Carrington Ecological Services (Lindsay Carrington Ecological Services, 2020). These are discussed within the results section (Section 4.0) of the current report. Species that have been scoped out by the Lindsay Carrington Ecological Services appraisal are not considered within this report.

Statutory and non-statutory designated sites and habitats are not considered within this report. These ecological features are discussed within the Preliminary Ecological Appraisal conducted by Lindsay Carrington Ecological Services (Lindsay Carrington Ecological Services, 2020).

3.4 Bat Survey

3.4.1 Survey Methods

Bat Transect Survey

Bat transect surveys were undertaken in line with current best practice guidelines (Collins, 2016). Given that the site has been assessed as having moderate suitability for supporting foraging and commuting bats a single survey visit was undertaken on a

[4] The Zone of Influence, as defined by CIEEM, is the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities.

monthly basis between April and October 2021 to allow an assessment of the status and importance of foraging/commuting bats at the site to be made.

A team of two surveyors walked a pre-determined transect route across the site on each occasion (**Map 2**), walking the same transect route on each survey with start and end points varied on each survey visit in order to vary the coverage of the site. The transect route ensured that the surveyors visited key areas of foraging and commuting habitat within the site, such as mature hedgerows and watercourses as well as less suitable habitats. The dusk transects surveys commenced at sunset and lasted for at least two hours depending on the level of bat activity recorded whilst the dawn transect survey commenced two hours before sunrise and lasted until sunrise. A single dusk and dawn transect survey was undertaken in the same 24 hour period.

The transect route was split into equal sections and was walked at a steady speed so that the activity levels on each section and from each survey are comparable.

At the end of each transect survey, data was downloaded and then analysed using BatExplorer (Version 2.1.6.0). This program is designed to analyse bat call data by identifying key call characteristics such as call shape, call length, call 'distance' (i.e. the time period between two consecutive calls) and peak frequency,

The species calls were subsequently checked manually by a suitably qualified ecologist using the spectrogram feature of BatExplorer to verify their identities. Where suitable recordings were obtained, bats were identified to species level. For some groups, notably long-eared bat species[5] and *Myotis*[6] bat species, specific identification was not always possible.

The GPS feature of the Batlogger M allows the location of the surveyor at the time of each bat call registration to be recorded. This data is exported to BatExplorer and used to create a 'heat map' of activity at the site for each bat species recorded.

The GPS feature shows the location of the surveyor when the registration was recorded, not the location of the bat. Where bats were heard but not seen it has been assumed that they are flying in the vicinity of the surveyor. Where bats were seen some distance from the surveyor the locations of these bats were noted.

[5] There are two species of long-eared bat, the brown long-eared bat *Plecotus auritus* and the grey long-eared bat *Plecotus austriacus*. These species can only be separated by examination of physical characteristics and Phylogenetic Analysis Identification of bat droppings. Unless confirmation of identification has been made by visual identification the two species shall be referred to in this report as long-eared bat. The brown long-eared bat is the commonest of the two species typically being found roosting within large roof voids although small voids and trees are also utilised. The grey long-eared bat is rare and confined to southern England and like the brown long-eared typically roosts in roof voids.
[6] There are seven species of *Myotis* bats in Britain. *Myotis* bats are very difficult to identify specifically, this can generally only be done by examination of physical features and Phylogenetic Analysis Identification of bat droppings. Many of these bats are common and will utilise buildings for roosting often occupying small and inaccessible voids. For the purpose of this report all species shall be referred to as *Myotis* bats unless a specific identification has been possible.

Bat Automated Detector Survey

In addition to the transect surveys automated detector surveys were undertaken in line with current best practice guidelines (Collins, 2016) between April and October 2021 inclusive.

Two Wildlife Acoustics Song Meter 4 (SM4 FS) detectors with SMM-U2 microphones were deployed at the site for five consecutive nights each month between April and October 2021.

The automated detectors were secured in suitable habitat with the microphone positioned to face towards the nearest open space. The devices were programmed to record between 30 minutes before sunset, until 30 minutes after sunrise the following morning on each night they were deployed. The settings utilised on the automated detectors are provided in **Appendix 2**.

The location at which each detector was deployed was varied throughout the survey period. The suitable habitat within the site was evaluated to give rise to four possible locations for automated detectors to be located, these locations alternated each month e.g. Locations 1 and 3 for April, 2 and 4 for May and so on. The locations at which the automated detectors were deployed are provided in (**Map 3**).

At the end of each automated survey period, the remote bat detectors were retrieved from the site, data was downloaded and then analysed using Kaleidoscope Pro© (Version 3.1.4B). This program is designed to analyse large volumes of bat call data using an automated classifier (Bats of United Kingdom Version 3.1.3). More information on the settings used for the conversion process are provided in **Appendix 2**.

The species calls were subsequently checked manually by a suitably qualified ecologist using the Kaleidoscope software, to verify their identities. Sonobat® (v2.9.7) was used to confirm the species identity for ambiguous bat calls. Where suitable recordings were obtained, bats were identified to species level. For some groups, notably long-eared bat species and *Myotis* bat species, specific identification was not always possible.

The data was then exported to Microsoft Excel for detailed analysis (i.e. counts of bat registrations) of various parameters.

The number of registrations recorded is not a measure of the number of bats present on site; the number of registrations provides a quantitative assessment of the level of bat activity at a particular location (i.e. the greater the number of registrations, the greater the level of bat activity). The data cannot differentiate between, for example, a single bat passing the detector 10 times or 10 bats passing the detector on a single

occasion. The detectors were programmed to count each two second call as a single bat pass.

In order to standardise the number of bat calls recorded the data was then used to calculate an "Activity Index" for various different parameters to be assessed. This involved dividing the number of registrations by the number of nights which detectors were deployed. This data is then represented as number of registrations per night.

3.4.2 Survey Details

Bat Transect Survey

The bat transect surveys were undertaken between April and October 2021 with a total of six dusk bat transect surveys and a single dusk pre-dawn survey. **Table 1** provides details of each survey.

Table 1: Bat transect survey details

Survey Date	Survey Type	Duration	Weather Conditions	Sunset/ Sunrise Time
26th April 2021	Dusk	20:18 – 22:18	10°C, dry, 5% cloud cover and no wind	20:18
25th May 2021	Dusk	21:01 – 23:01	9°C, dry, 80% cloud cover and a light breeze	21:01
28th June 2021	Dusk	21:23 – 23:24	19°C, very light rain throughout, 80% cloud cover and a light breeze	21:23
27th July 2021	Dusk	20:58 – 22:58	19°C, dry with some light rain towards the end, 100% cloud cover and a gentle breeze	20:58
28th July 2021	Dawn	03:26 – 05:28	16°C, dry, 90% cloud cover and a light breeze	05:26
19th August 2021	Dusk	20:17 – 22:17	20°C, light drizzle then dry, 100% cloud cover and a light breeze	20:17
20th September 2021	Dusk	19:07 – 20:58	18°C, dry, <10% cloud cover and no wind	19:07
12th October 2021	Dusk	18:18 – 20:18	16°C, dry, 75% cloud cover and a light breeze	18:18

The bat transect surveys were coordinated and led by Richard Chilcott, Principal Ecologist of ECOSA (Natural England Bat Licence No. 2015-16561-CLS-CLS), assisted by suitably qualified and experienced ECOSA surveyors.

The detector programming and data analysis was conducted by Richard Chilcott, Principal Ecologist of ECOSA.

Bat Automated Detector Survey

The automated detector surveys were undertaken between April and October 2021 with a total of 35 nights recording undertaken. **Table 2** provides details of each recording period.

Table 2: Automated detector survey details

Survey Period	Date	Weather Conditions[7]				Sunset	Sunrise
		Temperature (°C)		Wind (km/h)	Precipitation (mm)		
		High	Low				
April 2021	28th	7	7	0	0.3	20:21	05:43
	29th	7	5	3	0.0	20:23	05:41
	30th	7	-2	0	0.0	20:24	05:39
	1st	7	-1	0	0.0	20:26	05:38
	2nd	9	1	0	0.0	20:27	05:36
Early June 2021	3rd	16	10	0	0.0	21:11	04:54
	4th	15	7	0	0.0	21:12	04:54
	5th	16	10	0	0.0	21:13	04:53
	6th	15	12	0	0.0	21:14	04:53
	7th	15	7	0	0.0	21:15	04:52
Late June 2021	28th	17	15	0	4.1	21:22	04:53
	29th	16	12	0	0.0	21:22	04:54
	30th	17	13	0	0.0	21:22	04:55
	1st	19	14	0	0.0	21:22	04:55
	2nd	17	15	0	0.5	21:21	04:56
July 2021	27th	18	15	0	0.3	20:58	05:24
	28th	15	13	1	0.0	20:57	05:25
	29th	17	13	0	2.0	20:55	05:27
	30th	17	13	1	0.0	20:54	05:28
	31st	17	11	0	0.0	20:52	05:30
August 2021	19th	18	14	0	0.0	20:18	05:59
	20th	18	14	0	0.0	20:16	06:00
	21st	18	14	0	0.3	20:14	06:02

[7] Weather data is sourced from online weather data Station ID: IEASTL3 (Weather Underground, 2022)

Survey Period	Date	Weather Conditions[7]				Sunset	Sunrise
		Temperature (°C)		Wind (km/h)	Precipitation (mm)		
		High	Low				
	22nd	20	13	0	0.0	20:12	06:03
	23rd	17	10	0	0.0	20:10	06:05
September 2021	8th	19	17	0	0.0	19:35	06:30
	9th	19	16	0	0.3	19:33	06:31
	10th	18	16	0	0.0	19:30	06:33
	11th	18	8	0	0.0	19:28	06:34
	12th	18	11	0	0.0	19:26	06:36
October 2021	6th	14	10	0	0.0	18:32	07:13
	7th	16	14	0	0.0	18:30	07:15
	8th	16	6	0	0.0	18:27	07:17
	9th	13	7	0	0.0	18:25	07:18
	10th	15	4	0	0.0	18:23	07:20

The automated detectors were deployed by a suitably experienced ECOSA ecologist. The detector programming and data analysis was conducted by Megan Woolley, Assistant Ecologist of ECOSA.

3.4.3 Survey Limitations

Some bat species, e.g. long-eared bats *Plecotus* species[5], generally emerge from their roosts in total darkness and do not produce strong echolocations, and therefore these bats can be difficult to observe and record during bat surveys, leading to under-recording.

The quality of automated bat detector recordings is based, to a large extent, on the proximity of a bat to the detector's microphone. Obstructions such as vegetation or environmental variables such as rainfall and wind noise from vegetation will all influence the quality of sound reaching the microphone and thus some bat echolocation recordings are of insufficient quality for specific identification. Bats routinely alter their echolocations in relation to behaviour and their environment. It is not always possible to make a robust identification of every bat recording.

The use of bat detectors is likely to result in the under-recording of a percentage of bats present, such as those flying at height (Collins & Jones, 2009), which would be out of the recording range for the detectors.

During two of the survey nights in April 2021, the temperature dropped below 0°C. Due to the low overnight temperatures, it is likely that fewer bats may have used the site, for a shorter amount of time or used different foraging locations that are more sheltered.

3.5 Otter Survey

3.5.1 Survey Methods

A detailed investigation was undertaken of both banks of the on-site River Hamble tributary in order to record any evidence of otter such as spraints, footprints, feeding remains, otter slides, holts and couches. Any evidence encountered was mapped where appropriate. Where possible the survey was undertaken from within the watercourse in order to maximise the likelihood of encountering field signs.

3.5.2 Survey Details

The otter surveys were carried out by Jack Medley, Senior Field Ecologist of ECOSA on 28th June 2021 and by Hugh Turner, Senior Ecologist and Olivia Walton, Ecologist of ECOSA on 26th October 2021.

The weather conditions during the June survey were cloudy with some light rain, 75-100% cloud cover, an ambient temperature of 18ºC and a light wind.

The weather conditions during the October survey were occasional light rain, with approximately 100% cloud cover, an ambient temperature of 10ºC and a light wind.

3.5.3 Survey Limitations

There were no significant limitations to the otter survey.

3.6 Hazel Dormouse Survey

3.6.1 Survey Methods

The hazel dormouse survey was undertaken in line with current best practice guidelines (Bright, et al., 2006).

The hazel dormouse survey involved the erection of 60 dormouse tubes within suitable dormouse habitat throughout the site at intervals of approximately 10 metres. The locations of these tubes are marked on **Map 5**. The nest tubes were subsequently checked for evidence of dormouse on a monthly basis between June and November 2021.

In accordance with survey guidance, a value is assigned to each month, which is weighted depending on the likelihood of finding evidence of dormouse in a given month. These scores are based on the erection of 50 dormouse nest tubes. The values for each month that the tubes are in place are then added together. In accordance with

survey guidance, absence of dormouse should not be assumed for a search effort of less than 20 points[8]. **Table 3** shows points assigned for each month during the survey undertaken.

Table 3: Hazel dormouse survey index of probability scores

Month	Index of Probability Score
June	2
July	2
August	5
September	7
October	2
November	2
Total	**20**

The level of survey effort carried out at site currently provides a search effort of 20, which allows a robust assessment of the presence/absence of hazel dormouse at the site to be undertaken.

3.6.2 Survey Details

The dormouse tubes were erected on 27th May 2021 with monthly visits undertaken between July to November 2021. **Table 4** provides details of each hazel dormouse survey.

Table 4: Hazel dormouse survey details

Survey Date	Weather Conditions
1st July 2021	Dry, 21°C, overcast , 100% cloud cover, calm air
19th July 2021	Dry and sunny, 24°C, 0% cloud cover, a light breeze
24th August 2021	Dry, 21°C, 50% cloud cover, a moderate breeze
28th September 2021	Dry, windy, 17°C, 80% cloud cover, a moderate breeze
30th November 2021	Overcast and dry, 8°C, 80% cloud cover, a light breeze

The hazel dormouse surveys were co-ordinated and led by Richard Chilcott, Principal Ecologist of ECOSA assisted by suitably qualified ECOSA surveyors.

[8] Each month, between April and November, inclusive is assigned an index of probability score, based on optimum survey timings.

The survey was undertaken using 60 dormouse tubes comprising corrugated plastic tubes of standard dimensions (Bright, et al., 2006) with plywood insert secured in the relevant habitat with heavy duty garden wire.

3.6.3 Survey Limitations

There were no significant limitations to the hazel dormouse survey.

3.7 Water Vole Survey

3.7.1 Survey Methods

The survey was undertaken in accordance current best practice guidance (Strachan, et al., 2011) (Dean, et al., 2016) and consisted of a detailed water vole survey of the ditch with slow-moving water which joins the River Hamble 650 metres southwest of the site and separates the two fields.

The banks were accessed from within the ditch to maximise the identification of water vole signs including burrows, latrines and feeding remains in order to establish the presence/likely absence of the species from the watercourse. In addition, an assessment of the vegetation and bank structure was undertaken to assess its suitability for water vole.

Where evidence of water vole was encountered this was mapped. The best index of water vole abundance is established through number of latrines present in any one given stretch of habitat which provides an indication of the relative density of the species based on the presence of breeding individuals.

The presence/absence of mink, otter and brown rat signs were also recorded noting abundance of evidence recorded. The presence of these three species has a bearing on the likely presence of water vole.

3.7.2 Survey Details

The water vole surveys were carried out by Jack Medley, Senior Field Ecologist of ECOSA on 28th June 2021 and by Hugh Turner, Senior Ecologist and Olivia Walton, Ecologist of ECOSA on 26th October 2021.

The weather conditions during the June survey were cloudy with some light rain, 75-100% cloud cover, an ambient temperature of 18ºC and a light wind.

The weather conditions during the October survey were occasional light rain, with approximately 100% cloud cover, an ambient temperature of 10ºC and a light wind.

3.7.3 Survey Limitations

There were no significant limitations to the water vole survey.

3.8 Bird Survey

3.8.1 Survey Methods

Breeding Bird Survey

Breeding bird transects surveys were undertaken using a modified version the British Trust for Ornithology (BTO) Breeding Bird Survey (Baillie, et al., 2012). Given the simple nature of the habitats on site, three visits were undertaken between April and June 2021. Surveys were split by no less than two weeks.

The bird surveyor walked a pre-determined transect route across the site, on each occasion walking the same transect route (**Map 6**). The transect route ensured that the surveyor visited key areas of habitat for breeding birds such as large expanses of grassland / arable land and hedgerowsas well as less suitable habitats. The transect was punctuated by pauses to scan and listen for territorial birds. The transect survey was always undertaken during the morning and began within one hour of sunrise. The route across the site was varied so that time-location bias was minimised. Surveys were undertaken in suitable weather conditions i.e. without strong winds or heavy rainfall.

The survey was aimed at recording the presence of Schedule 1[9] and / or British Trust for Ornithology red[10] or amber listed Birds of Conservation Concern (Eaton, et al., 2015) and assessing the number of active territories of notable species within the site. Green listed species were recorded but no attempt was made to identify their territories. Territorial activity was mainly defined by the presence of singing birds, however other evidence such as courtship and display, agitated behaviour, nest building, distraction display, recently fledged young, occupied nests and / or birds carrying food was also used.

On completion of the surveys evidence of territorial birds and confirmed breeding evidence was transferred onto a single map. Clusters of registrations on this map coincide with the activity of territory holding birds, although with some species this varies with biology. The maps were then analysed to determine the number of pairs of each notable breeding species present, a process open to subjectivity in interpretation, and requiring professional judgement.

The detectability of bird species and associated territorial activity is affected by a variety of factors including, but not limited to; species detectability, species abundance,

[9] Birds listed on Schedule 1 of the Wildlife and Countryside Act (1981 as amended) are afforded additional protection making it an offence to: Intentionally or recklessly disturb any bird while it is nest building, or is at a nest containing eggs or young; or; Intentionally or recklessly disturb the dependent young of any such bird.
[10] The UK's birds are split in to three categories of conservation importance - red, amber and green. Red is the highest conservation priority, with species needing urgent action. Amber is the next most critical group, followed by green.

temporal variations in activity, species phenology, habitat structure, survey effort and observer ability. During the breeding bird survey methods to reduce these potential impacts included; using experienced ornithologists and undertaking a robust number of surveys spread over the main breeding season. As a result, a comprehensive assessment of the breeding bird assemblage at the site was completed.

3.8.2 Survey Details

Breeding Bird Survey

A total of three survey visits were undertaken between April and June 2021. **Table 5** provides details of each breeding bird survey.

Table 5: Breeding bird survey details

Survey Date	Weather Conditions
28th April 2021	Bright, dry and mild, 8°C, 25% cloud cover and a gentle breeze
26th May 2021	Dry, calm and warm, 8°C, <10% cloud cover and no wind
13th June 2021	Dry and sunny, 12°C, 25% cloud cover and a light breeze

The breeding bird survey was carried out by experienced ornithologist Simon Colenutt, Managing Principal Ecologist of ECOSA.

During the breeding bird survey the surveyor was equipped with 10x42 binoculars.

3.8.3 Survey Limitations

Since the breeding bird surveys were undertaken, the Birds of Conservation Concern list was updated (Stanbury, et al., 2021). It is possible that some bird species, previously green listed and now amber listed[12] were not the focus of the survey and may not have been recorded.

3.9 Reptile Survey

3.9.1 Survey Methods

The reptile survey was undertaken in accordance with current best practice guidelines (Froglife, 1999; Froglife, 2015).

The reptile survey consisted of the laying bitumen felt mats approximately 500 millimetres x 500 millimetres in areas of suitable habitat on the site. Typically, this included areas of suitable habitat with good exposure to the sun. The mats were distributed in all areas considered to offer suitable reptile habitat. The locations of these mats are marked on **Map 7**.

The use of such refugia is an effective way of surveying for all species of reptile and current survey guidance states that seven inspections are sufficient to confirm presence/likely absence. Survey visits were undertaken in marginal weather conditions such as cold but sunny weather or hazy and somewhat overcast conditions, as this will maximise the thermal value of the refugia for basking reptiles.

During each visit surveyors also undertook a visual inspection survey of other suitable refugia in the site and other suitable basking locations. During the survey a note was also made of any suitable hibernation features present within the site.

3.9.2 Survey Details

A total of 80 reptile refugia were distributed on 6th August 2021 with seven inspection visits undertaken between 17th September 2021 and 12th October 2021. **Table 6** provides details of each reptile survey.

Table 6: Reptile survey details

Survey Date	Air Temperature (°C)	Weather Conditions
17th September 2021	17	Clear & dry, 40% cloud cover, light breeze
21st September 2021	17	Dry, 5% cloud cover, light breeze
24th September 2021	15	Dry, 10% cloud cover, light breeze
28th September 2021	15	Dry, 75% cloud cover, moderate breeze
1st October 2021	15	Dry, 0% cloud cover, moderate breeze
6th October 2021	13	Sunny & dry, 10% cloud cover, light breeze
12th October 2021	16	Sunny, 50% cloud cover, calm

The reptile survey was coordinated by Richard Chilcott, Principal Ecologist of ECOSA assisted by suitably experienced ECOSA surveyors.

3.9.3 Survey Limitations

There were no significant limitations to the reptile survey.

3.10 Great Crested Newt Survey

3.10.1 Survey Methods

Habitat Suitability Index (HSI) Assessment

Those ponds and waterbodies located within a 500 metre radius of the site (**Map 8**), where access permitted, were subject to a Habitat Suitability Index (HSI) assessment (Oldham, et al., 2000). HSI is a numerical index between 0 and 1, derived from an assessment of ten habitat variables known to influence the presence of great crested

newt such as geographical location, water body size and permanence, presence of predatory fish and wildfowl, availability of suitable terrestrial habitat and proximity to other ponds. Each factor is scored based on its level of suitability for great crested newt. An HSI of 1 is optimal habitat (high probability of occurrence), while an HSI of 0 is very poor habitat (minimal probability of occurrence). The HSI is calculated on a single pond basis, but takes into account surrounding terrestrial habitat and local pond density. If a pond has a very low HSI score (<0.5) there would typically be a minimal chance of great crested newt presence.

This qualitative score can then be used, with caution, to indicate whether further detailed investigations are necessary or whether a particular waterbody can be 'scoped out' as unsuitable for great crested newts. However, professional judgement should be used rather than simply relying on the HSI to eliminate ponds from further assessment. Further detailed investigations would involve targeted surveys carried out between mid-March and mid-June to determine presence/absence of great crested newt and if present then an assessment of population status.

Environmental DNA (eDNA) Survey

The great crested newt environmental DNA (eDNA) sampling was undertaken following current best practice guidelines (Biggs, et al., 2014).

Given the presence of a number of waterbodies within 500 metres of the site boundary an environmental DNA (eDNA) analysis was undertaken to establish the presence / likely absence of great crested newt from within the ponds which were accessible (**Map 8**).

The field sampling entailed the collection of 20 samples of 30 millilitres of water from pre-selected sub-sampling sites around the margin of each waterbody. Sub-sampling sites are chosen to include areas where great crested newt are likely to be present such as areas of vegetation where they may be egg laying and areas of open water where they may be displaying. The 20 samples are then mixed into a single sterile bag from which six samples of water of 15 millilitres are taken each of which is preserved in 35 millilitres of ethanol. The samples are then refrigerated until analysis at the lab. The samples were sent to Surescreen DNA testing service for analysis which were analysed in line with current guidance (Biggs, et al., 2014). The samples were taken within the required season (mid-April to June) when great crested newt eDNA is likely to be present within the pond and therefore, the analysis result indicates the presence or likely absence of the species from a given waterbody.

3.10.2 Survey Details

Habitat Suitability Index (HSI) Assessment/ Environmental DNA (eDNA) Survey

The great crested newt HSI assessment and eDNA survey was carried out by Jack Medley, Senior Field Ecologist of ECOSA (Natural England Great Crested Newt Licence No. 2018-33078-CLS-CLS) on 28th June 2021. The weather conditions were dry with approximately 50% cloud cover, an ambient temperature of 19ºC and a light breeze.

3.10.3 Survey Limitations

It was not possible to survey Pond 4 (see **Map 8**) due to access not being granted at the time. This related to COVID-19 restrictions at the associated care home

It was not possible to access the majority of Pond 1 due to presence of thick marginal vegetation obscuring the steep banks. The water samples taken from the wider, less vegetated area around the bridge to the north.

3.11 Criteria used to Assess Ecological Value

The evaluation criteria used in this report are based on ECOSA's professional judgement and publicly available publications, survey data and other sources as referenced in the main text. The evaluation is based on a sliding scale of importance as follows; international and European, national, regional, county, local and site. There are a wide range of characteristics which contribute to the importance of ecological features, and these may justify an increase or reduction in the value of an ecological feature. Where deviations occur, these will be explained in the evaluation section of this report (Section 4.0). Current published relevant guidance, including information sources such as A Nature Conservation Review (Ratcliffe, 1977) and Guidelines for Ecological Impact Assessment in the United Kingdom (CIEEM, 2018) have also been used to inform the assessment.

4.0 BASELINE ECOLOGICAL CONDITIONS

4.1 Introduction

This section details the results of the species-specific survey work undertaken at the site. It assesses the baseline ecological conditions of the site based on the findings of the species surveys. This section also provides an assessment of the ecological value of ecological features present at the site.

4.2 Scoping

Within this section, only species/species groups for which further surveys have been undertaken are considered. Where species have either been scoped out during the Preliminary Ecological Appraisal or where suitable habitat is present for these species but further surveys are not required (Lindsay Carrington Ecological Services, 2020), these are not discussed within this report.

4.3 Bats

4.3.1 Baseline Ecological Conditions

Bat Transect Survey Results

A total of seven bat transect surveys including one dusk/dawn survey were undertaken between April and October 2021 during which time a total of six species of bat were recorded within the site including common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, serotine *Eptesicus serotinus*, long-eared bat *Plecotus* species, *Myotis* bat species and noctule *Nyctalus noctula*.

Concentrations of bat activity were frequently recorded along the northern boundary adjacent to the vegetation following the railway line, along the ditch that separates the two fields and along the western boundary hedgerow. Bat activity increased as the survey season went on, with more bats recorded in the second half of transect surveys that in the first half. The locations of the bat activity recorded are provided on **Map 2** with a summary of the findings of each survey provided in **Table 7**.

Table 7: Bat activity recorded during transect surveys

Survey Date	General Bat Activity at the Site
26th April 2021	A total of four species were recorded during the transect survey: *Myotis* bat species, noctule, soprano pipistrelle and common pipistrelle. The vast majority of registrations were of common pipistrelle (26 registrations out of a total of 33). Noctule and *Myotis* bat species were recorded less frequently (just two and one registrations respectively). The majority of the activity was recorded along the northern site boundary adjacent to the railway line.

Survey Date	General Bat Activity at the Site
25th May 2021	Just two species were recorded during the transect survey: common pipistrelle (16 registrations) and soprano pipistrelle (one registration). The majority of the activity was recorded along the northern site boundary adjacent to the railway line.
28th June 2021	Just two species were recorded during the transect survey: common pipistrelle (28 registrations) and soprano pipistrelle (one registration). The majority of the activity was recorded within the centre of the site, along the ditch that separates both fields.
27th July 2021	A total of three species were recorded during the transect survey: common pipistrelle (29 registrations), soprano pipistrelle (12 registrations) and long-eared bat species (eight registrations). Bat activity was fairly evenly spread across the site, with concentrations along the southern boundary, western boundary along Station Hill and north-eastern corner.
28th July 2021	Just two species were recorded during the transect survey: common pipistrelle (32 registrations) and soprano pipistrelle (one registration). Bat activity was fairly evenly spread across the site, with concentrations along the southern boundary and western boundary along Station Hill.
19th August 2021	A total of four species were recorded during the transect survey: common pipistrelle (79 registrations), soprano pipistrelle (16 registrations) and long-eared bat species (one registration) and serotine (six registrations). Bat activity was fairly evenly spread across the site, with concentrations along the southern boundary, western boundary along Station Hill, centre of the site along the ditch and north-eastern corner.
20th September 2021	A total of four species were recorded during the transect survey: common pipistrelle (83 registrations), soprano pipistrelle (46 registrations) and long-eared bat species (one registration) and *Myotis* bat species (eight registrations). Bat activity was recorded across all areas of the site during the survey.
12th October 2021	A total of three species were recorded during the transect survey: common pipistrelle (121 registrations), soprano pipistrelle (13 registrations) and *Myotis* bat species (12 registrations). Bat activity was concentrated along the northern boundary adjacent to the railway line and the western boundary along Station Hill.

Bat Automated Detector Survey Results

The automated bat detector survey results recorded a total of 17,199 bat registrations of seven species: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle *Pipistrellus nathusii, Myotis* bat species, noctule, serotine and Leisler's bat *Nyctalus leisleri*.

Activity by Species

Table 8 shows the number of registrations and proportion of recorded bat activity at the site by species. The most frequently recorded species was common pipistrelle which accounted for approximately 79% of all registrations. Soprano pipistrelle was the next most frequently recorded species but with far fewer registrations (approximately 16% of all registrations). Nathusius' pipistrelle, *Myotis* bat species, noctule, serotine

and Leisler's bat were all recorded in fewer numbers, accounting for between 2.19% and 0.03% of registrations only.

Table 8: Number of registrations and proportion of bat activity from each species

Species	No. Registrations	% Registrations
Common pipistrelle	13,603	79.0%
Soprano pipistrelle	2,850	16.6%
Nathusius' pipistrelle	377	2.2%
Myotis bat species	245	1.4%
Noctule	82	0.5%
Serotine	37	0.2%
Leisler's bat	5	<0.1%
Grand Total	**17,199**	**100.00%**

Species Activity by Month

Table 9 provides the number of registrations of each species recorded within each month. The highest number of bat registrations were recorded in September (4,911 in total). Late June, July, August and October all saw relatively moderate levels of bat activity while fewer bats were recorded in Early June (636) and April (251).

Table 9: Number of registrations of each month split by species

Period	Species	No. Registrations	Activity Index
April 2021	Common pipistrelle	242	24.2
	Myotis species	6	0.6
	Soprano pipistrelle	2	0.2
	Nathusius' pipistrelle	1	0.1
April 2021 Total		**251**	**25.1**
Early June 2021	Common pipistrelle	571	57.1
	Soprano pipistrelle	35	3.5
	Nathusius' pipistrelle	20	2.0
	Serotine	6	0.6
	Noctule	2	0.2
	Myotis species	2	0.2
Early June 2021 Total		**636**	**63.6**
Late June 2021	Common pipistrelle	2,438	243.8
	Soprano pipistrelle	149	14.9
	Nathusius' pipistrelle	33	3.3
	Myotis species	22	2.2
	Noctule	14	1.4
	Leisler's bat	4	0.8

Period	Species	No. Registrations	Activity Index
	Serotine	7	0.7
Late June 2021 Total		**2,663**	**266.3**
July 2021	Common pipistrelle	3,058	305.8
	Soprano pipistrelle	121	12.1
	Noctule	5	0.5
	Myotis species	5	0.5
	Nathusius' pipistrelle	2	0.2
July 2021 Total		**3,191**	**319.1**
August 2021	Common pipistrelle	1,846	184.6
	Soprano pipistrelle	1,704	170.4
	Myotis species	39	3.9
	Noctule	25	2.5
	Nathusius' pipistrelle	11	1.1
	Serotine	11	1.1
	Leisler's bat	1	0.2
August 2021 Total		**3,636**	**363.6**
September 2021	Common pipistrelle	3,985	398.5
	Soprano pipistrelle	537	53.7
	Nathusius' pipistrelle	309	30.9
	Myotis species	47	4.7
	Noctule	22	2.2
	Serotine	11	1.1
September 2021 Total		**4,911**	**491.1**
October 2021	Common pipistrelle	1,463	146.3
	Soprano pipistrelle	302	30.2
	Myotis species	124	12.4
	Noctule	14	1.4
	Serotine	2	0.2
	Nathusius' pipistrelle	1	0.1
October 2021Total		**1,906**	**190.6**
Grand Total		**17,199**	**245.7**

Activity Levels at Locations

Table 10 shows the number of registrations recorded at each individual location throughout the survey period. The highest number of species was recorded most frequently at Location 1 (six species in total on three occasions). However, bat activity was spread relatively evenly across the site throughout the survey season. Leisler's bat was only recorded in Locations 1 and 3. It should be noted that, as the detectors were moved on each occasion, locations are not directly comparable.

Table 10: Activity Recorded at Each Location

Period	Location	Species	No. Registrations	Activity Index
April 2021	Location 1	Common pipistrelle	241	48.2
		Myotis species	3	0.6
		Soprano pipistrelle	2	0.4
		Nathusius' pipistrelle	1	0.2
	Location 1 Total		**247**	**49.4**
	Location 3	Myotis species	3	0.6
		Common pipistrelle	1	0.2
	Location 3 Total		**4**	**0.8**
Early June 2021	Location 2	Common pipistrelle	539	107.8
		Soprano pipistrelle	25	5
		Nathusius' pipistrelle	20	4
		Noctule	2	0.4
		Myotis species	1	0.2
	Location 2 Total		**587**	**117.4**
	Location 4	Common pipistrelle	32	6.4
		Soprano pipistrelle	10	2
		Serotine	6	1.2
		Myotis species	1	0.2
	Location 4 Total		**49**	**9.8**
Late June 2021	Location 1	Common pipistrelle	940	188
		Soprano pipistrelle	127	25.4
		Nathusius' pipistrelle	23	4.6
		Myotis species	16	3.2
		Serotine	5	1
		Noctule	5	1
		Leisler's bat	2	0.4
	Location 1 Total		**1,116**	**223.2**
	Location 3	Common pipistrelle	1,498	299.6
		Soprano pipistrelle	22	4.4
		Nathusius' pipistrelle	10	2
		Noctule	9	1.8
		Myotis species	6	1.2
		Serotine	2	0.4
		Leisler's bat	2	0.4
	Location 3 Total		**1,547**	**309.4**
July 2021	Location 2	Common pipistrelle	2,305	461
		Soprano pipistrelle	74	14.8
		Noctule	4	0.8
	Location 2 Total		**2,383**	**476.6**
	Location 4	Common pipistrelle	753	150.6
		Soprano pipistrelle	47	9.4
		Myotis species	5	1

		Nathusius' pipistrelle	2	0.4
		Noctule	1	0.2
	Location 4 Total		**808**	**161.6**
August 2021	Location 1	Common pipistrelle	1,650	330
		Soprano pipistrelle	1,627	325.4
		Myotis species	32	6.4
		Noctule	14	2.8
		Nathusius' pipistrelle	11	2.2
		Serotine	7	1.4
		Leisler's bat	1	0.2
	Location 1 Total		**3,341**	**668.2**
	Location 3	Common pipistrelle	196	39.2
		Soprano pipistrelle	77	15.4
		Noctule	11	2.2
		Myotis species	7	1.4
		Serotine	4	0.8
	Location 3 Total		**295**	**59**
September 2021	Location 2	Common pipistrelle	2,974	594.8
		Nathusius' pipistrelle	308	61.6
		Soprano pipistrelle	377	75.4
		Myotis species	39	7.8
		Serotine	6	1.2
		Noctule	4	0.8
	Location 2 Total		**3,708**	**741.6**
	Location 4	Common pipistrelle	1,011	202.2
		Soprano pipistrelle	160	32
		Noctule	18	3.6
		Myotis species	8	1.6
		Serotine	5	1
		Nathusius' pipistrelle	1	0.2
	Location 4 Total		**1,203**	**240.6**
October 2021	Location 1	Common pipistrelle	961	192.2
		Soprano pipistrelle	272	54.4
		Myotis species	107	21.4
		Noctule	2	0.4
		Serotine	2	0.4
		Nathusius' pipistrelle	1	0.2
	Location 1 Total		**1,345**	**269**
	Location 3	Common pipistrelle	502	100.4
		Soprano pipistrelle	30	6
		Myotis species	17	3.4
		Noctule	12	2.4
	Location 3 Total		**561**	**112.2**
Grand Total			**17,199**	**245.7**

4.3.2 Evaluation

Foraging and Commuting Bats

Bat surveys recorded a total of eight species of bat foraging and commuting at the site. **Table 11** shows the geographic level of value of foraging and commuting habitat at the site.

Table 11: Value of the site to bat species/species complexes

Species	Foraging and Commuting Value
Common pipistrelle	Local
Soprano pipistrelle	Local
Long-eared bat	Local
Serotine	Local
Noctule	Local
Leisler's bat	Local
Nathusius' pipistrelle	Local
Myotis species	Local

There are seven species of *Myotis* bats in Britain. *Myotis* bats are very difficult to identify specifically, this can generally only be done by examination of physical features and Phylogenetic Analysis Identification of bat droppings. Many of these bats are relatively common in Hampshire including Natterer's bat and Daubenton's bat. Given the nature of the site and habitats present, it is considered likely that the *Myotis* bat registrations are attributable to these species.

Natterer's bat, Daubenton's bat, noctule, serotine, Leisler's bat and Nathusius' pipistrelle are widespread in Hampshire, and common pipistrelle, soprano pipistrelle and brown long-eared bat are considered common (Hampshire Biodiversity Information Centre, 2021). The site does not reach the threshold for SINC designation within Hampshire which generally requires the presence of exceptionally large single-species colonies or large hibernacula (Hampshire Biodiversity Information Centre, 2021). As such, the site is assessed as having local-level foraging and commuting value only.

4.4 Otter

4.4.1 Baseline Ecological Conditions

Otter Survey Results

A single possible otter spraint was recorded on site during the survey. This was located along the ditch which separates the two fields. (See **Map 4**). No other evidence of otter was recorded.

4.4.2 Evaluation

It is considered likely that otter will use this wet ditch for commuting purposes, however the channel is not considered suitable for resident otter due to its size. The site is located some 520 metres east of the nearest main watercourse of the River Hamble where fish stocks and foraging opportunities are likely to be more suitable and otter is more likely to be more frequently present.

Only sites which support regular breeding populations of Hampshire Notable mammals (of which otter is one) will be considered for SINC selection (Hampshire Biodiversity Information Centre, 2021). As such, the site is assessed as being of site-level importance only to otter.

4.5 Hazel Dormouse

4.5.1 Baseline Ecological Conditions

Hazel Dormouse Survey Results

The hazel dormouse survey confirmed the presence of dormouse within the site. The results of the hazel dormouse survey are presented in **Table 12**. Locations of the hazel dormouse records are provided on **Map 5**.

Table 12: Hazel dormouse survey results

Survey Date	Results
1st July 2021	A single wood mouse nest and individual was recorded.
19th July 2021	A fresh wood mouse nest and two unfinished small mammal nests were recorded.
24th August 2021	A fresh wood mouse nest and two unfinished small mammal nests were recorded.
28th September 2021	Five fresh wood mouse nests, three wood mouse food caches, an unidentified food cache, two wood mouse individuals and a single hazel dormouse nest were recorded.
30th November 2021	Four wood mouse nests, two wood mouse nests with individuals, five wood mouse food caches, two nests of unknown species, a single hazel dormouse nest and a yellow-necked mouse individual and nest were recorded.

4.5.2 Evaluation

The site forms part of network within the local area of well-connected hazel dormouse habitat. In particular, the vegetation bounding the railway line to the north which connects the site to blocks of woodland to the south and east. Given that a single hazel dormouse nest was recorded in site, it is considered likely that individuals would nest on site infrequently and use more suitable habitat in the wider area on a more regular basis. Only sites which support regular breeding populations of Hampshire Notable mammals (of which hazel dormouse is one) will be considered for SINC selection (Hampshire Biodiversity Information Centre, 2021). As such, the site is assessed as being of site-level importance only to hazel dormouse.

4.6 Water Vole

4.6.1 Baseline Ecological Conditions

Water Vole Survey Results

No evidence of water vole was recorded during the survey. As such, water vole is considered likely absent from the site and is not discussed further in this report.

4.7 Birds

4.7.1 Baseline Ecological Conditions

Breeding Bird Survey Results

Table 13 provides a list of red and amber listed bird species recorded within the site with locations recorded provided on **Map 6**. These are house sparrow *Passer domesticus,* wren *Troglodytes troglodytes* and song thrush *Turdus philomelos.* It should be noted that since the breeding bird surveys were undertaken, the Birds of Conservation Concern list was updated (Stanbury, et al., 2021). It is possible that some bird species, previously green listed and now amber listed[12] were not the focus of the survey.

Table 13: Bird territories recorded within the site

Species	Estimated No. of Territories	Red List[11]	Amber List[12]
House sparrow	1	X	
Wren	4		X
Song Thrush	2		X

In addition, a number of red and amber listed bird species were recorded during the survey works which were not considered to be breeding on the site. Species recorded include starling *Sturnus vulgaris*, herring gull *Larus argentatus,* rook *Corvus frugilegus,* stock dove *Columba oenas* and woodpigeon *Columba palumbus*.

A number of common and widespread species were also recorded within the site including swallow *Hirundo rustica*, carrion crow *Corvus corone*, magpie *Pica pica*, pied wagtail *Motacilla alba*, great spotted woodpecker *Dendrocopos major*, buzzard *Buteo buteo*, blue tit *Cyanistes caeruleus*, robin *Erithacus rubecula*, goldfinch *Carduelis carduelis*, great tit *Parus major*, collared dove *Streptopelia decaocto*, chiffchaff *Phylloscopus collybita* and blackbird *Turdus merula*.

The species recorded were largely typical of those which nest in hedgerows and no species such as skylark *Alauda arvensis* associated with grassland habitats were

[11] Birds of Conservation Concern Red List
The UK's birds are split in to three categories of conservation importance - red, amber and green. Red is the highest conservation priority, with species needing urgent action. Amber is the next most critical group, followed by green. Red List criteria include species which are: globally threatened; have been subject to historical population decline in UK during 1800–1995; are in severe (at least 50%) decline in UK breeding population over last 25 years, or longer-term period, or; subject to severe (at least 50%) contraction of UK breeding range over last 25 years, or longer-term period.
[12] Birds of Conservation Concern Amber List
Amber list criteria include species which are: in unfavourable conservation status in Europe; subject to historical population decline during 1800–1995, but recovering; subject to moderate (25-49%) decline in UK breeding population or contraction of UK breeding range over last 25 years, or the longer-term period; subject to moderate (25-49%) decline in UK non-breeding population over last 25 years, or the longer-term period; rare breeders (1–300 breeding pairs in UK); rare non-breeders (less than 900 individuals), or; internationally important species with at least 20% of European breeding or non-breeding population in UK .

recorded. The species of most conservation importance was house sparrow which is red listed species[11].

4.7.2 *Evaluation*

Breeding Birds

Of the species recorded, song thrush, starling, house sparrow and herring gull are Hampshire notable species. However, in order to meet the threshold for SINC selection, a site must support 10 breeding pairs or 10 non-breeding individuals of song thrush, 10 breeding pairs or 100 non-breeding individuals of starling, 20 breeding pairs or 50 non-breeding individuals of house sparrow and one breeding pair of herring gull (Hampshire Biodiversity Information Centre, 2021). The site does support these required numbers, as such is not of country or local level importance. Therefore, the site is assessed as being of site-level importance for breeding birds.

4.8 Reptiles

4.8.1 *Baseline Ecological Conditions*

Reptile Survey Results

A peak count of three adult slow-worm and one juvenile slow-worm were recorded on site. A summary of the reptile surveys at the site is provided in **Table 14** and on **Map 7**.

Table 14: Summary of reptile survey results

Survey Date	Number of Individuals Recorded	
	Slow-worm	
	Adult	Juvenile
17th September 2021	3	1
21st September 2021	0	0
24th September 2021	0	0
28th September 2021	0	0
1st October 2021	1	0
6th October 2021	1	0
12th October 2021	0	0
Peak Count	**3**	**1**

4.8.2 *Evaluation*

Population Class Size Assessment

Table 15 shows the current guidance (Froglife, 1999) for assessing the population size of reptiles based on a refugia density of 10 per hectare. A density of seven refugia per hectare was used at the site and therefore the population size assessment has been adjusted accordingly.

Table 15: Criteria for population size assessment based upon a refugia density of 10 per hectare

Species	Low Population	Good Population	Exceptional Population
Slow-worm	<4	4-14	>14

Given the peak count of three adults, the site can be assessed as supporting a low population of slow-worm.

Evaluation

The site supports a low population of slow-worm with a peak count of just three adults. While slow-worm is a Hampshire Notable species, a population of 50 or more adults is required to meet the threshold for SINC selection. Therefore the site is below county level importance for slow-worm (Hampshire Biodiversity Information Centre, 2021). The site represents a small proportion of suitable habitat for slow-worm in the wider area, including the railway line sidings to the north. As such, the site is assessed as being of no more than site-level importance to slow-worm.

4.9 Great Crested Newt

4.9.1 *Baseline Ecological Conditions*

Great Crested Newt HSI Assessment Results

All ponds that were surveyed including Ponds 1, 2, 3, 5 and 6 were all assessed as having 'poor' suitability for breeding great crested newt, with scores of between 0.00 and 0.26. All ponds were recommended for further eDNA surveys. Pond 4 was not accessible (see Paragraph 3.10.3). **Table 16** presents the results of the HSI survey.

Table 16: Waterbodies within 500m of Site Boundary - Details

Pond No.	NGR	Location in Relation to Site Boundary	HSI Score	HSI Suitability	Waterbody Description	Access Possible	Further Survey
1	SU 5228 1306	On site	0.00	Poor	Slow flowing wet ditch/ stream. Unable to access vast majority due to thick marginal vegetation obscuring steep banks. All water samples taken in wider less vegetated area around bridge in north of site.	Yes	eDNA
2	SU 5200 1274	222 metres south	0.26	Poor	Wet ditch adjacent to hedgerow and horse grazed pasture. Water not flowing.	Yes	eDNA
3	SU 5220 1276	110 metres south	0.26	Poor	Wet ditch adjacent to hedgerow and horse grazed pasture. Water slow flowing.	Yes	eDNA
4	SU 5211 1355	394 metres north	-	-	No access due to being in care home and refused on Covid-19 grounds	No	eDNA
5	SU 5235 1237	381 metres south	0.22	Poor	Drained each winter with good marginal vegetation.	Yes	eDNA
6	SU 5232 1269	110 metres south	0.26	Poor	Two small ponds approximately 5 metres apart with good emergent vegetation	Yes	eDNA

Great Crested Newt eDNA Survey Results

The eDNA survey returned negative for all ponds surveyed (Ponds 1, 2, 3, 5 and 6). Pond 4 could not be accessed (see **Appendix 4** for eDNA survey results). As great crested newt does not breed within the surrounding area, the species is considered likely absent from the site and is not discussed further in this report.

5.0 POTENTIAL ECOLOGICAL CONSTRAINTS AND RECOMMENDATIONS

5.1 Introduction

This section identifies potential constraints to the proposed development scheme based on the key ecological features as identified in Section 4.0. Recommendations are included for mitigation and compensation based on the identified ecological constraints, and opportunities for enhancement are discussed.

5.2 Bats

5.2.1 Potential Constraints

The use of the site by foraging and commuting bats has been identified as a potential constraint to the development.

Loss or severance of linear habitats at the site including hedgerows and the ditch could result in commuting habitat fragmentation for bats. Loss of other vegetated areas including grassland would mean an overall loss in habitat suitable for foraging. There may be disturbance to foraging and commuting bats in the long-term if new external lighting is to be installed at the site.

In England, bats and their habitat are fully protected under the Wildlife and Countryside Act 1981 through inclusion in Schedule 5. In addition, all bat species are protected under the Conservation of Habitats and Species Regulations 2017. Refer to **Appendix 2** for details.

5.2.2 Potential Mitigation and Compensation Measures

Detailed mitigation and compensation measures would be devised once detailed proposal plans are known. However, to address the potential constraints identified in Paragraph 5.2.1, it is recommended that, where external lighting is needed, a sensitive lighting scheme should be devised with input from an ecologist. General guidance includes the use of hooded luminaires directed away from vegetation and the use of LED bulbs that are at the warmer end of the spectrum (e.g. avoiding blue or white light). Guidance on bats and artificial lighting should be followed (Bat Conservation Trust, 2018).

It is also recommended that as much boundary vegetation as possible is retained in order to maintain habitat connectivity into the wider landscape for foraging and commuting bats. Or if removed, connectivity may have to be reinstated through replacement tree or hedgerow planting.

5.2.3 Enhancement Opportunities

There will be opportunities for enhancement via provision of bat boxes installed on retained trees and/or artificial bat roost units within new properties. Newly landscaped areas could also be designed with bats in mind. For example, flowering shrubs to attract insect prey and native tree species.

5.3 Otter

5.3.1 Potential Constraints

The occasional presence of commuting otter within the on-site ditch has been identified as a possible constraint to the development.

In England, otter and their habitat are fully protected under the Wildlife and Countryside Act 1981 through inclusion in Schedule 5. In addition, this species is protected under the Conservation of Habitats and Species Regulations 2017 (refer to **Appendix 2** for details). In particular, construction related activities that create dust and surface run-off as well as possible pollution events may enter the on-site ditch and cause degradation to this habitat and off-site habitat hydrologically linked to the site. It is assumed that no changes will be made to the ditch, therefore no long-term habitat fragmentation is anticipated for otter. However, bank erosion caused by trampling or loss of cover through management may occur during the operational phase.

5.3.2 Potential Mitigation and Compensation Measures

It is recommended that a Construction Environmental Management Plan (CEMP) is produced and implemented for the duration of the construction phase. The document should include details of how surface run-off, spillages and dust levels would be controlled to ensure the protection of suitable otter habitat provided by the on-site ditch.

It is recommended that a vegetated buffer is created along the banks of the ditch to discourage trampling by new residents and protect the ditch habitat from degradation and bank erosion.

5.3.3 Enhancement Opportunities

The vegetation buffer recommended above would enhance the site for otter in the long-term by providing additional shelter and opportunities for holt construction.

5.4 Hazel Dormouse

5.4.1 Potential Constraints

The presence of hazel dormouse on site has been identified as a potential constraint to the development. In England, hazel dormouse and their habitat are fully protected under the Wildlife and Countryside Act 1981 through inclusion in Schedule 5. In

addition, this species is protected under the Conservation of Habitats and Species Regulations 2017 (refer to **Appendix 3** for details).

Removal of boundary hedgerows may result in the harm/injury of individual animals, while loss or severance of boundary vegetation may cause habitat fragmentation for the species and an overall loss of suitable habitat. Where boundary vegetation is retained, it is possible that hazel dormouse habitat may be damaged during the construction phase through accidental damage to vegetation by machinery or through root compaction.

5.4.2 Potential Mitigation and Compensation Measures

If boundary vegetation is to be removed, a licence from Natural England would need to be obtained prior to any removal. However, it is recommended that as much boundary vegetation as possible is retained in order to maintain habitat connectivity into the wider landscape for hazel dormouse.

If removed, connectivity may have to be reinstated through replacement hedgerow planting. If boundary vegetation is to be retained, tree protected fencing should be used to shield vegetation for the duration of the construction phase, to protect the habitat from damage or degradation.

5.4.3 Enhancement Opportunities

There are opportunities for enhancement of the site for hazel dormouse in the form of new native hedgerow planting along the south-western boundary where currently no boundary vegetation is present. Hedgerow planting could include species favourable for hazel dormouse including hazel *Corylus avellana,* holly *Ilex aquifolium,* hawthorn *Crataegus monogyna* and bramble *Rubus fruticosus* aggregate. This would improve habitat connectivity and provide an additional foraging resource.

5.5 Birds

5.5.1 Potential Constraints

The presence of breeding birds within the site has been identified as a potential constraint to the development as all birds, their nests, eggs and young are legally protected, with certain exceptions, under the Wildlife and Countryside Act 1981 (refer to **Appendix 2** for details). If woody vegetation removal is carried out during the breeding season of March to August inclusive, it is possible that nesting birds and their eggs/young may become harmed or injured. However, the bird species recorded on site are largely hedgerow species which would likely persist following development.

The proposals may also result in a net loss in habitat suitable for breeding if hedgerows are removed and no compensation measures are provided.

5.5.2 *Potential Mitigation and Compensation Measures*

In order to avoid the potential constraints outlined above, it is recommended that as much woody vegetation and hedgerows are retained as possible. Any removal of woody vegetation should be undertaken outside of the breeding season of March to August inclusive. If this is not possible, an ecologist should be present immediately prior to removal to check vegetation. Any active nests should be left with a suitable buffer to avoid harm to nesting birds and their young.

Lost habitat should be compensated for through new tree, hedgerow and/or low-level planting where possible.

5.5.3 *Enhancement Opportunities*

Opportunities for enhancement could be achieved through provision of artificial nest boxes installed on retained trees and/or incorporated into the newly constructed properties. These could include swift bricks (**Figure 1**), house sparrow terraces (**Figure 2**) and tree-mounted nest boxes suitable for a range of small species (**Figure 3**).

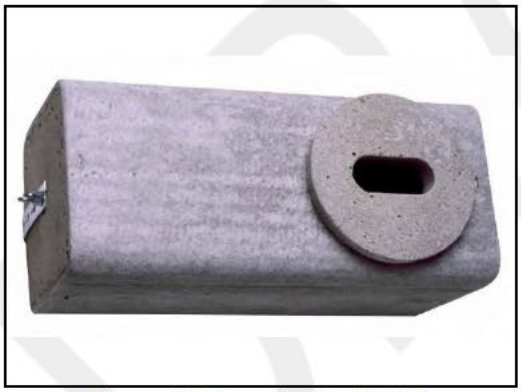


Figure 1: Example of swift brick

Figure 2: Example of house sparrow terrace (Vivara Pro Woodstone house sparrow terrace)

Figure 3: Example of artificial nest box (Vivara Pro Seville Woostone Nest Box

5.6 Reptiles

5.6.1 Potential Constraints

The presence of a low population of slow-worm on the site has been identified as a potential constraint to the development. Slow-worm is protected under the Wildlife and Countryside Act 1981 against harm (see **Appendix 2** for details). Clearance of suitable slow-worm habitat and any related ground works may result in harm/injury to individuals, causing an offence.

There would also be a net loss in habitat suitable for slow-worm. It is likely that either on-site or off-site compensatory habitat will be required. Maintaining habitat connectivity for the species will also be a consideration for the development.

5.6.2 Potential Mitigation and Compensation Measures

Detailed mitigation and compensation measures would be devised once details proposal plans are known. However, given the presence of a low population of slow-worm, prior to the commencement of construction it is recommended that a reptile translocation is undertaken. This would involve the erection of 1000 gauge polythene exclusion fencing around the perimeter of the construction zone. The fence would be buried into the ground approximately 100 millimetres. Posts would be erected at approximately one to two metre intervals to support the fence. The exclusion fence would be installed by, or under the supervision of a suitably qualified ecologist.

Following the installation of the exclusion fence, a high density of reptile refugia would be distributed throughout the site and inspected on a daily basis until five ‘clear’ visits have been achieved. It is anticipated that the translocation will take a minimum period of 60 days, however, the exact number of visits required to remove the maximum number of animals possible would depend on the site conditions.

Refugia checks would occur between April and October when reptiles are not in hibernation, and completed during suitable conditions i.e. temperatures between 9°C and 20°C and preferably during overcast or occasionally sunny conditions. All encountered animals would be captured by hand, and translocated to a previously identified receptor site.

Following five clear days of no capture, a destructive search would be undertaken by or under the supervision of a suitably qualified ecologist. The habitat would be cleared via methodical strimming to ground level, followed by the top layer of vegetation stripped using an excavator with a toothed bucket under the supervision of an ecologist. Any additional reptiles encountered would be translocated outside of the fenced area. Once the destructive search is completed, and all suitable reptile habitat removed, the development works would be able to proceed.

The reptile fencing would remain *in situ* for the remainder of the construction period and until the completion of the proposed development.

It is recommended that a suitable off-site receptor area is identified and used for the translocation exercise. This area would also act as compensation for the loss of suitable reptile habitat on site.

5.6.3 Enhancement Opportunities

There will be opportunities for enhancement via the creation of log piles to act as hibernacula for slow-worm and other reptiles. These could be stacked at site boundaries adjacent to retained hedgerows. Communal landscaped areas could also be managed with reptiles in mind, such as letting grassy areas grow long to provide additional sheltering and foraging habitats.

6.0 CONCLUSION

6.1 Conclusion

The site is of local value to foraging and commuting bats and supports common and widespread bat species. Evidence of otter was recorded within the on-site ditch and hazel dormouse has been confirmed as present within boundary hedgerows. The site also supports habitat suitable for breeding birds and a low population of slow-worm was recorded on site.

The above ecological features have been identified as representing a potential constraint to the development as their legal protection prevents their killing, injury or disturbance or protects them and their habitats at certain times of year.

Potential mitigation measures have been recommended to address these constraints, including the implementation of a sensitive lighting strategy, preparation and implementation of a CEMP to protect the on-site ditch habitat, use of protection fencing to ensure no damage to boundary hedgerows during construction and sensitive or precautionary working methods and timings. It has also been recommended that as much boundary vegetation as possible is retained as part of the scheme. Any habitat suitable for these species which will be lost as part of the proposals, should be replaced.

Enhancement opportunities for the site have been presented. These include provision of bat roosting units within each new property, a vegetated buffer along the ditch to improve the site for otter, new hedgerow planting along the south-western boundary, provision of bird nest boxes and creation of reptile hibernacula.

The recommendations within this report would need to be reviewed and updated where necessary once detailed proposal plans are known. However, it is considered that the proposals have the potential to accord with all relevant local and national planning policy, if the recommendations within this report are implemented.

6.2 Updating Site Survey

If the planning application boundary changes or the proposals for the site alter, a re-assessment of the scheme in relation to ecology may be required. Given the mobility of animals and the potential for colonisation of the site over time, updating survey work may be required, particularly if development does not commence within 18 months of the date of the most recent relevant survey.

7.0 REFERENCES

Baillie, S. R. et al., 2012. *BirdTrends 2001. BTO Research Report No. 609,* Thetford: BTO.

Bat Conservation Trust, 2018. *Bats and Artificial Lighting in the UK: Bats and the Built Environment Series. Guidance Note 08/18,* s.l.: Bat Conservation Trust.

Biggs, J. et al., 2014. *Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA.* Oxford: Freshwater Habitats Trust.

Bright, P., Morris, P. & Mitchell-Jones, T., 2006. *The Dormouse Conservation Handbook.* 2nd ed. Peterborough: Natural England.

CIEEM, 2017. *Chartered Institute of Ecology and Environmental Management Website.* [Online]
Available at: www.cieem.net

CIEEM, 2017. *Guidelines for Ecological Report Writing.* 2nd ed. Winchester: Chartered Institute of Ecology and Environmental Management.

CIEEM, 2018. *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.* Winchester: Chartered Institute of Ecology and Environmental Management.

CIEEM, 2018. *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.* Winchester: Chartered Institute of Ecology and Environmental Management.

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

Collins, J. & Jones, G., 2009. Differences in Bat Activity in Relation to bat Detector Height: Implications for Bat Surveys at Proposed Windfarm Sites. *Acta Chiropterologica,* 11(2), pp. 343-350.

Dean, M., Strachan, R., Gow, D. & Andrews, R., 2016. *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series).* London: The Mammal Society.

Eaton, M. A. et al., 2015. Birds of Conservation Concern 4: The Population Status of Birds in the United Kingdom. Channel Islands and Isle of Man. *British Birds,* Volume 108, pp. 708-746.

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

Hampshire Biodiversity Information Centre, 2021. *Criteria for the Selection of Sites of Importance for Nature Conservation (SINCs) in Hampshire,* s.l.: Hampshire Biodiversity Information Centre.

Lindsay Carrington Ecological Services, 2020. *Preliminary Ecological Appraisal - Land east of Station Hill, Botley Station, Curdridge, Hampshire SO30 2HA,* Wareham: Lindsay Carrington Ecological Services.

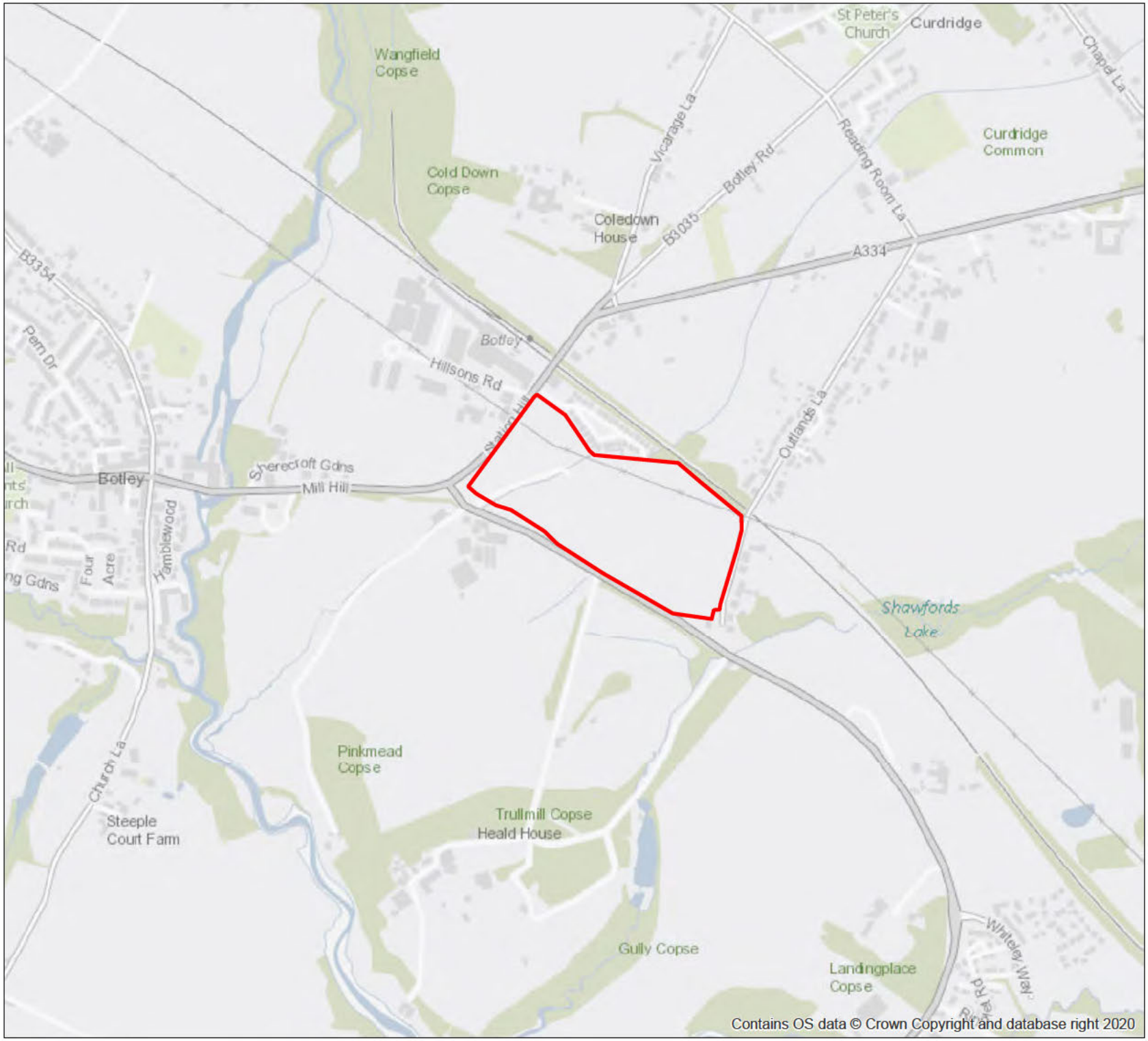
Oldham, R. S., Keeble, J., Swan, M. J. S. & Jeffcote, M., 2000. Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus). *Herpetological Journal,* 10(4), pp. 143-155.

Ratcliffe, D., 1977. *A Nature Conservation Review.* Cambridge: Cambridge University Press.

Strachan, R., Moorhouse, T. & Gelling, M., 2011. *Water Vole Conservation Handbook.* 3rd ed. Oxford: WildCRu.

Weather Underground, 2022. *Weather Underground.* [Online] Available at: https://www.wunderground.com/ [Accessed 5 September 2022].

Map 1 Site Location Plan



STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Map 1 - Site Location Plan

Client:	Foreman Homes
Date:	October 2022
Status:	Final

KEY

Site Boundary

Scale at A4: 1:10,000

0 100 200 400 Metres

N

Prepared by: DM	Date: 261021
Last amended by: HB	Date: 130922

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

Map 2 Bat Transect Survey

STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Map 2a - Bat Transect Survey Results (April)

Client:	Foreman Homes
Date:	March 2022
Status:	Draft

KEY

- Site Boundary
- Common pipistrelle
- Myotis species
- Noctule
- Soprano pipistrelle

Scale at A4: 1:2,500

0 25 50 100 Metres

N

Prepared by: EV	Date: 210322
Last amended by: N/A	Date: N/A

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Map 2b - Bat Transect Survey Results (May)

Client:	Foreman Homes
Date:	March 2022
Status:	Draft

KEY

- Site Boundary
- Common pipistrelle
- Soprano pipistrelle

Scale at A4: 1:2,500

0 25 50 100 Metres

N

Prepared by: EV	Date: 210322
Last amended by: N/A	Date: N/A

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Map 2c - Bat Transect Survey Results (June)

Client:	Foreman Homes
Date:	March 2022
Status:	Draft

KEY

- Site Boundary
- Common pipistrelle
- Soprano pipistrelle

Scale at A4: 1:2,500

0 25 50 100 Metres

N

Prepared by: EV	Date: 210322
Last amended by: N/A	Date: N/A

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Map 2d - Bat Transect Survey Results (July - Dusk/Dawn)

Client:	Foreman Homes
Date:	March 2022
Status:	Draft

KEY

- Site Boundary
- Common pipistrelle
- Long-eared bat
- Soprano pipistrelle

Scale at A4: 1:2,500

0 25 50 100 Metres

N

Prepared by: EV	Date: 210322
Last amended by: N/A	Date: N/A

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT Map

Map 2e - Bat Transect Survey Results (August)

Client:	Foreman Homes
Date:	March 2022
Status:	Draft

KEY

- Site Boundary
- Common pipistrelle
- Long-eared bat
- Serotine
- Soprano pipistrelle

Scale at A4: 1:2,500

0 25 50 100 Metres

N

Prepared by: EV	Date: 210322
Last amended by: N/A	Date: N/A

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices,
Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Map 2f - Bat Transect Survey Results (September)

Client:	Foreman Homes
Date:	March 2022
Status:	Draft

KEY

- Site Boundary
- Common pipistrelle
- Long-eared bat
- Myotis species
- Soprano pipistrelle

Scale at A4: 1:2,500

0 25 50 100 Metres

N

Prepared by: EV	Date: 210322
Last amended by: N/A	Date: N/A

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Map 2g - Bat Transect Survey Results (October)

Client:	Foreman Homes
Date:	March 2022
Status:	Draft

KEY

- Site Boundary
- Common pipistrelle
- Myotis species
- Soprano pipistrelle

Scale at A4: 1:2,500

0 25 50 100 Metres

N

Prepared by: EV	Date: 210322
Last amended by: N/A	Date: N/A

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

Map 3 Bat Automated Detector Survey

STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Map 3 - Bat Automated Detector Survey

Client:	Foreman Homes
Date:	September 2022
Status:	Draft

KEY

Site Boundary

Automated Detector Locations 2021

Months Deployed

- April, June, August, and October
- May, July, September

N.B. Two bat automated detectors were deployed once per month between April and October 2021 for a period of five consecutive nights. Deployments alternated between Location 1 and 3, and Location 2 and 4.

Scale at A4: 1:3,000

0 30 60 120 Metres

N

Prepared by: DM	Date: 261021
Last amended by: HB	Date: 130922

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

Map 4 Otter and Water Vole Survey

STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Map 4 - Otter and Water Vole Survey

Client:	Foreman Homes
Date:	September 2022
Status:	Draft

KEY

- Site Boundary
- Ditch
- Approximate Survey Area

Otter and Water Vole Survey Results 2021

- Possible Otter Spraint

Scale at A4: 1:3,000

0 30 60 120 Metres

N

Prepared by: DM	Date: 261021
Last amended by: HB	Date: 130922

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

Map 5 Hazel Dormouse Survey

STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Map 5 - Hazel Dormouse Survey

Client:	Foreman Homes
Date:	September 2022
Status:	Draft

KEY

- Site Boundary

Dormouse Survey Results

- Dormouse nest
- Woodmouse evidence
- Unidentified species evidence
- No evidence recorded

Scale at A4: 1:3,000

0 30 60 120 Metres

N

Prepared by: DM	Date: 261021
Last amended by: HB	Date: 130922

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

Map 6 Breeding Bird Survey

STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Map 6 - Breeding Bird Survey

Client:	Foreman Homes
Date:	September 2022
Status:	Draft

KEY

- Site Boundary
- Bird Species
- House Sparrow Territory
- Song Thrush Territory
- Wren Territory
- Breeding Bird Survey Transect Route

Scale at A4: 1:2,800

0 25 50 100 Metres

N

Prepared by: HB	Date: 060922
Last amended by: N/A	Date: N/A

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

Map 7 Reptile Survey

STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Map 7 - Reptile Survey

Client:	Foreman Homes
Date:	September 2022
Status:	Draft

KEY

Site Boundary

Reptile Refugia Locations 2021

Survey Results

- Slow-worm, adult female and juvenile
- Slow-worm, adult female
- No reptiles recorded

Scale at A4: 1:3,000

0 30 60 120 Metres

N

Prepared by: DM	Date: 261021
Last amended by: HB	Date: 130922

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

Map 8 Great Crested Newt Survey

STATION HILL, BOTLEY, HAMPSHIRE

INTERIM ECOLOGICAL ASSESSMENT

Map 8 - Great Crested Newt Survey

Client:	Foreman Homes
Date:	September 2022
Status:	Draft

KEY

- Site Boundary
- 500m Great Crested Newt Buffer

Great Crested Newt eDNA Survey Results 2021

- Waterbody subject to eDNA survey, negative result - GCN absent
- Waterbody not subject to eDNA survey - No access
- Waterbody Number

Scale at A4: 1:8,000

0 80 160 320 Metres

N

Prepared by: DM	Date: 261021
Last amended by: HB	Date: 130922

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company
ECOSA Ltd., Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire SO52 9DF
Telephone: 02380 261065 Email: info@ecosa.co.uk
Web: www.ecosa.co.uk

Appendix 1 Appraisal Criteria for Bats

The criteria used to assess the suitability of roosting and foraging/commuting habitat for bats is based on industry guidelines and outlined in **Table 17**[13].

Table 17: Criteria used to Assess Suitability of Roosting and Foraging/Commuting Habitat for Bats

Suitability	Description of roosting habitats	Commuting and foraging habitats
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.
Moderate	A structure of 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.	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.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically/structure that does 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 potential roost features 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 hedgerows 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 or a patch or scrub.
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.

[13] Table adapted from (Collins, 2016)

Appendix 2 Automated Detector Settings

Automated Detector Settings

Automated detectors can be calibrated in a number of different settings which can result in the potential variations in the way that bat calls are recorded. **Table 18** details the standard settings used by ECOSA during automated detector surveys undertaken.

Table 18: Standard automated detector settings

Option	Basic Setup
Settings - Audio	
Sample rate	192000Khz
Channels	Mono L (left)
Compression	WAV
Gain Left	+0.00
Gain Right	+0.00
Settings - Audio Advanced	
Dig High Pass Filter (HPF) Left	Fs/12
Dig High Pass Filter (HPF) Right	Off
Digital Low Pass Filter (LPF) Left	Off
Digital Low Pass Filter (LPF) Right	Off
Trig Lvl Left	12SNR
Trig Lvl Right	Off
Trg Win Left	2.0s
Trg Win Right	2.0s
Trg Max Length	2s
Bits (Div Ratio)	16
Nap Trg Lvl	Off

Data Conversion Settings

In order to analyse the data efficiently the raw .wav files recorded on the automated detector are subsequently converted to zero crossing (.zc) files which and subject to automated classification by Wildlife Acoustics Kaleidoscope Pro. During the conversion process the data is filtered to remove noise files in line with Wildlife Acoustics recommended setting as provided in **Table 19**.

Table 19: Noise file filtering settings

Option	Basic Setup
Signal of Interest – Frequency	8 – 120 kHz
Signal of Interest – Call Length	2 - 500ms
Signal of Interest – Minimum Number of Calls	2
Advanced Signal Enhancement	On

All filtered noise files are kept and subsequently assessed for bat calls in order to ensure that no bat calls have been incorrectly classified as noise. The "Advanced Signal Enhancement" setting discards files which Kaleidoscope assessed as being insufficient quality. Any discarded files are subsequently not stored by Kaleidoscope and therefore, not subject to analysis by an ecologist.

Appendix 3 Relevant Legislation

Bats

All UK bat species are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017. They are afforded full protection under Section 9(4) of the Act and Regulation 43 of the Regulations. These make it an offence to:

- Deliberately capture, injure or kill any such animal;
- Deliberately disturb any such animal, including in particular any disturbance which is likely:
- To impair its ability to survive, breed, or rear or nurture their young;
- To impair its ability to hibernate or migrate;
- To affect significantly the local distribution or abundance of that species;
- Damage or destroy a breeding site or resting place of any such animal;
- Intentionally or recklessly disturb any of these animals while it is occupying a structure or place that it uses for shelter or protection; or
- Intentionally or recklessly obstruct access to any place that any of these animals uses for shelter or protection.

In addition, five British bat species are listed on Annex II of the Habitats Directive. These are:

- Greater horseshoe bat Rhinolophus ferrumequinum;
- Lesser horseshoe bat Rhinolophus hipposideros;
- Bechstein's bat *Myotis bechsteinii*;
- Barbastelle Barbastella barbastellus; and
- Greater mouse-eared bat *Myotis myotis*.

In certain circumstances where these species are found the Directive requires the designation of Special Areas of Conservation (SACs) by EC member states to ensure that their populations are maintained at a favourable conservation status. Outside SACs, the level of legal protection that these species receive is the same as for other bat species.

Hazel Dormouse and Otter

These species are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017. They are afforded full protection under Section 9(4) of the Act and Regulation 43 of the Regulations. These make it an offence to:

- Deliberately capture, injure or kill any such animal;
- Deliberately disturb any such animal, including in particular any disturbance which is likely, to impair its ability to survive, breed, or rear or nurture their young, to impair its ability to hibernate or migrate;
- To affect significantly the local distribution or abundance of that species;
- Damage or destroy a breeding site or resting place of any such animal;
- Intentionally or recklessly disturb any of these animals while it is occupying a structure or place that it uses for shelter or protection; or
- Intentionally or recklessly obstruct access to any place that any one of these species uses for shelter or protection.

Breeding Birds

With certain exceptions, all wild birds, their nests and eggs are protected by Section 1 of the Wildlife and Countryside Act 1981 (as amended). Therefore, it is an offence, to:

- Intentionally kill, injure or take any wild bird;
- Intentionally take, damage or destroy the nest of any wild bird while it is in use or being built; or
- Intentionally take or destroy the egg of any wild bird.

These offences do not apply to hunting of birds listed in Schedule 2 subject to various controls. Bird species listed on Schedule 1 of the Act receive further protection, thus for these species it is also an offence to:

- Intentionally or recklessly disturb any bird while it is nest building, or is at a nest containing eggs or young; or
- Intentionally or recklessly disturb the dependent young of any such bird.

Reptiles

The four widespread species of reptile that are native to Britain, namely common or viviparous lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, adder *Vipera berus* and grass snake *Natrix*

helvetica, are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are afforded limited protection under Section 9 of this Act. This makes it an offence to:

- Intentionally kill or injure any of these species.

The remaining native species of British reptile (sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca*) receive a higher level of protection via inclusion under Schedule 2 of the Conservation of Habitats and Species Regulations 2017. They are afforded full protection under Section 9(4) of the Act and Regulation 43 of the Regulations (in England and Wales only) and the Wildlife and Countryside Act 1981 (as amended). The distribution of these species are restricted to only a few sites in England.

Appendix 4 Great Crested Newt eDNA Results

SureScreen Scientifics

Folio No: E11428
Report No: 1
Purchase Order: 0095
Client: ECOSA
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: 01/07/2021
Date Reported: 05/07/2021
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
7471	Station Road, Botley, 7471 - Pond 5	Su5235712372	Pass	Pass	Pass	Negative	0
7472	Station Hill, Botley, Ponds 6 - 7472	Su5232112698	Pass	Pass	Pass	Negative	0
7473	Station Hill, Botley, 7473 - Pond (ditch) 3	Su5219912766	Pass	Pass	Pass	Negative	0
7474	Station Hill, Botley, 7474 Pond (stream/ditch) 1	Su5228513067	Pass	Pass	Pass	Negative	0
7476	Station Hill, Botley, 7476 - Pond (ditch) 2	Su5200612749	Pass	Pass	Pass	Negative	0

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

Reported by: [redacted] **Approved by:** [redacted]

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 should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.