



Phase 2C Development Wadswick Green, nr Corsham

Ecology Report

Produced for Rangeford Villages

By Applied Ecology Ltd

March 2023

Document information:

Version	Date	Version Details	Prepared by	Checked by	Approved by
1.0	2 March 2023	1.0	DP/NB	DP	DP

Prepared for: Rangeford Villages
Title: Phase 2C Development, Wadswick Green, nr Corsham – Ecology Report
Project number: AEL0776
Document version: 1.0
Document status: Final
Document date: 2 March 2023

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1 Introduction

Background

- 1.1 Applied Ecology Ltd (AEL) was commissioned by Vitus Consult Ltd on behalf of Rangeford Villages to carry out an ecology assessment of a proposed remaining phase of development (called Phase 2C) within the Wadswick Green continuing care development near Corsham in Wiltshire ("the Site"). A plan showing the location of the Site and the Phase 2C boundary is provided by **Figure 1.1**.
- 1.2 The survey was required to determine the likely ecological constraints associated with proposals to construct two new residential accommodation blocks ("the Development"), and to establish the potential scope of further, more detailed ecological surveys which may be needed to support any future planning application(s).

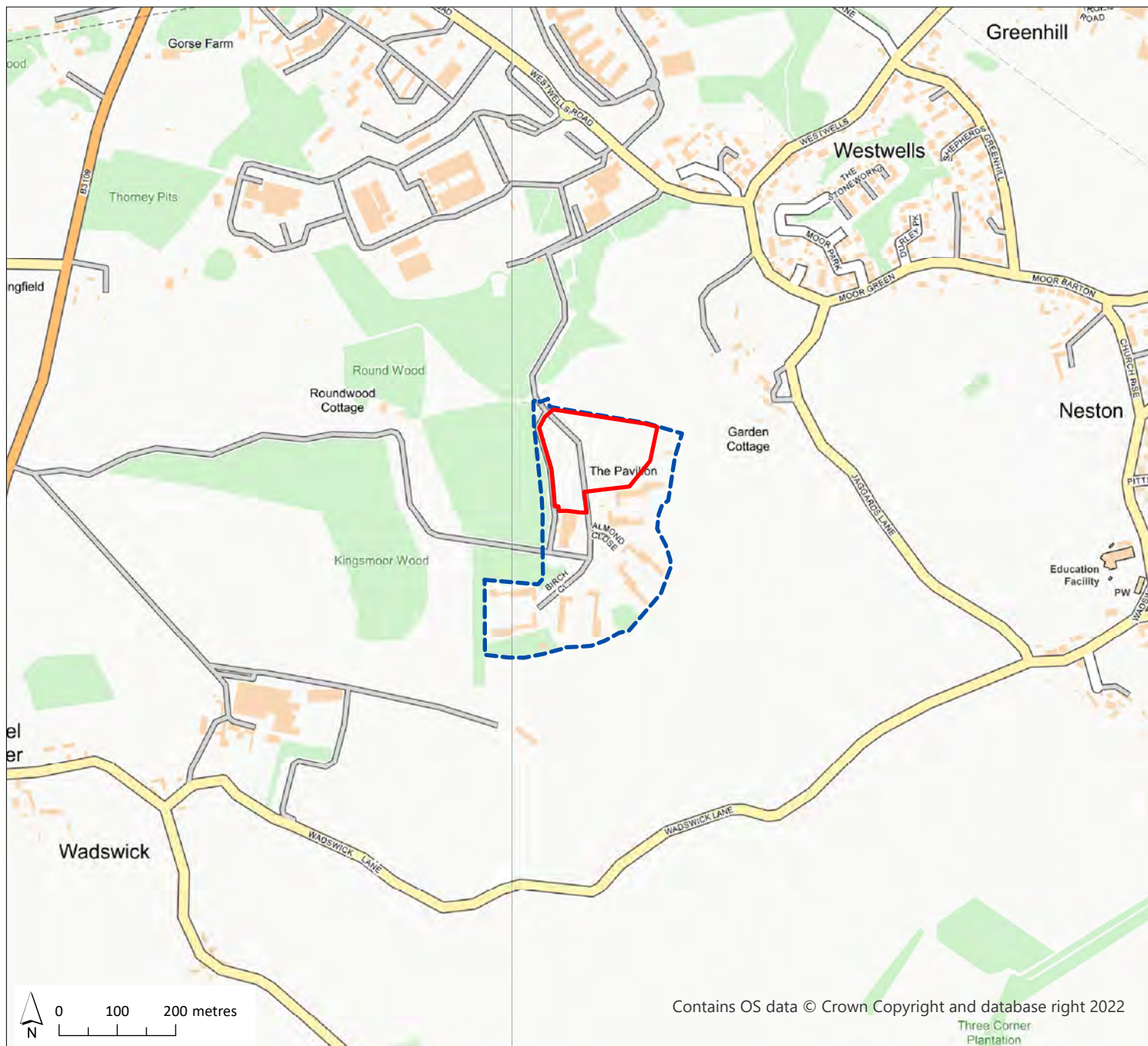
Purpose of this report

- 1.3 This report provides details relating to the surveys undertaken on the Site in May 2022 with a follow-up verification survey in February 2023. Recommendations for further survey are also described, where these are considered relevant.

Report qualification

- 1.4 The surveys described here were undertaken in accordance with the best practice methodologies current at the time of commissioning. Site circumstances, scientific knowledge or methodological requirements can change during the course of a project, and these external factors may impact on the scope of subsequent work requirements.
- 1.5 All survey work and reporting was undertaken by experienced and qualified ecologists in accordance with the Code of Professional Conduct of the Chartered Institute of Ecology and Environmental Management (CIEEM) and BS 42020:2013 (Biodiversity).
- 1.6 All ecological surveys have an expected validity period, owing to the tendency of the natural environment to change over time. This validity period varies from feature to feature, and is also dependent on the degree of change in a site's management and overall landscape ecology. Where the potential for change is considered to be relevant to the Site, this is highlighted in the appropriate section.
- 1.7 This report does not purport to provide detailed, specialist legal advice. Where legislation is referenced, the reader should consult the original legal text, and/or the advice of a qualified environmental lawyer.





Wadswick Green

Site location

- Phase 2C boundary
- Site boundary

Figure 1.1

Map Scale @ A4: 1:10,000

Surveyed by: n/a

Survey date: n/a

Drawn by: NB

Checked by: DP

Status: Final



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Three Corner
Plantation

2 Methodology

Pre-existing information

- 2.1 The redevelopment of the Site from a derelict Royal Navy training barracks called HMS Royal Arthur Park to the Wadswick Green continuing care community has been the subject of two European protected species licences in relation to great crested newt (EPSM 2011-2784) and bats (EPSM 2011-2839). The compensation measures implemented under the terms of both licences has been subject to ongoing monitoring by AEL.

Great crested newt

- 2.2 Prior to its redevelopment, HMS Royal Arthur possessed a small and overgrown/shaded duck pond that supported a small non-breeding population of great crested newts (GCN). The pond was removed and the entire Site cleared of newts at the start of the redevelopment under the terms of the licence, and two new ponds were created and planted as compensation - with a third pond dug to the north as part of a subsequent development phase. To date no evidence of colonisation by GCN has been recorded in any of the three ponds, but it is of note that the original duck pond only supported a single GCN, and only a single GCN was captured and relocated as part of the licenced site clearance.

Bats

- 2.3 Two bat houses were constructed to the north and south of the Site in the winter of 2013-2014 prior to the commencement of site clearance and demolition as compensation for the loss of the RMS Royal Arthur buildings that supported a declining breeding colony of 30 lesser horseshoe bats (LHB), and the days roosts of small numbers of greater horseshoe, and common pipistrelle bats. Both bat houses had three enclosed bat boxes built into their three gable apexes for crevice roosting bats,
- 2.4 Both bat houses were colonised by the returning LHB maternity colony in April 2014 and have been used as maternity roost every year since. The LHB colony has increased in size over the years and is dispersed between the two bat houses, with the southern bat house typically supporting the greatest number of bats. In July 2020 and July 2021 the total count of LHB adults and new born pups across the two bat houses was 137, and 131 respectively. In July 2022 the total count across the two bat houses was 172. Individual day roosting greater horseshoe bats have also been shown to make occasional use of both buildings for day roosting and regularly forage in the wider Site, along with individual day roosting common pipistrelles that make use of enclosed bat boxes built into the gables of both buildings.
- 2.5 A location plan of the two bat houses is provided in **Appendix 1**. A summary of the bat house monitoring completed to date is provided in **Table 2.1** below. In 2016 the three enclosed external bat boxes on each bat house were inspected from a ladder using an endoscope and all six boxes were shown to possess individual pipistrelle bats. Monitoring of the external bat boxes has not been continued.



Barn owl

- 2.6 Prior to the redevelopment of the Site, a number of the derelict buildings were used by a roosting barn owl. No evidence of breeding by barn owl was ever recorded. The two bat houses are used occasionally by a roosting barn owl as evidenced by the presence of barn owl pellets and droppings on the floor of both buildings.
- 2.7 Two barn owl boxes have been provided within the developed site (see **Appendix 1** for locations) but to date neither box has shown any evidence of use by barn owl, only use by corvids and a stock dove (monitoring check completed 28 July 2022).
- 2.8 Small numbers of barn owl pellets are encountered occasionally within the two bat houses confirming that the species makes occasional roosting use of both buildings.

Table 2.1: Horseshoe bat monitoring of bat houses in Wadswick Green

Date	Monitoring type	Northern bat house			Southern bat house			Maximum annual total LHB
		Lesser horseshoe adult	Lesser horseshoe pup/young	Greater horseshoe adult	Lesser horseshoe adult	Lesser horseshoe pup/young	Greater horseshoe	
16.7.2014	Daytime count inside bat house	0	0	0	22	0	0	22
2.7.2015	Daytime count inside bat house	7	Present	0	12	Present	0	19
18.8.2016	Daytime count inside bat house	15	Present	1	40	Present	0	55
13.7.2017	Daytime count inside bat house	16	1	0	55	12	1	91
19.4.2018 No summer survey completed	Daytime count inside bat house	5	0	0	15	0	0	20
19.8.2019	Emergence count	16	Not recorded	1	85	Not recorded	0	101
15.7.2020	Emergence and pup count after emergence	25	4	0	84	24	0	137



8.7.2021	Emergence and pup count after emergence	30	2	0	74	25	0	131
28.7.2022	Emergence and pup count after emergence	31	2	0	114	25	0	172

Habitats and plants

- 2.9 An extended Phase 1 Habitat Survey of the Phase 2C area and adjoining land was completed on 13 May 2022 by Dr Duncan Painter CEnv MCIEEM¹. The methodology adopted followed the standard JNCC approach to Phase 1 Habitat Survey (JNCC, 1993²) by which all habitats present within the site were classified and mapped according to standard categories. Habitat patches were mapped as polygon features, and if sufficient space on the map linear features (such as walls and fences) as lines where this provided added value. Point features were recorded where there were notable isolated trees or scrub. Plant species abundance was noted using the DAFOR³ system.
- 2.10 The habitat map was subsequently digitised using a Geographical Information System (ArcGIS).
- 2.11 The survey was carried out in dry and bright conditions during the recognised season for completing habitat survey.
- 2.12 A follow-up survey of the Site was completed on 23 February 2023 that verified that the habitats recorded in 2022 were still present and as recorded previously.

Fauna

- 2.13 The standard Phase 1 Habitat Survey was "extended" to include a search for evidence of or potential for the presence of protected species or species of nature conservation interest within and close to the site. This was not a detailed survey for such species, but included noting the presence of habitats suitable to support specific protected species, and where seen, any evidence of presence such as droppings, mammal tracks and footprints, shelters (or nests/roosts), hair caught on fence-wire, foraging signs, and so on.
- 2.14 Checks for badger setts were completed during both the 13 May 2022 and 23 February 2023 surveys.

¹ Holds three separate licences pertaining to bat survey: WML-CL18; WML-CL21; and WML-CL32 and has been a registered bat roost volunteer visitor for Natural England (WML-CL15). Holds a class licences in relation to badger (WML-CL35) and great crested newt (WML-CL09 & WML-CL33), hazel dormouse (WML-CL10A), and native crayfish (WML-CL11).

² JNCC (1993) *Handbook for Phase 1 Habitat Survey – A technique for Environmental Audit*. JNCC, Peterborough.

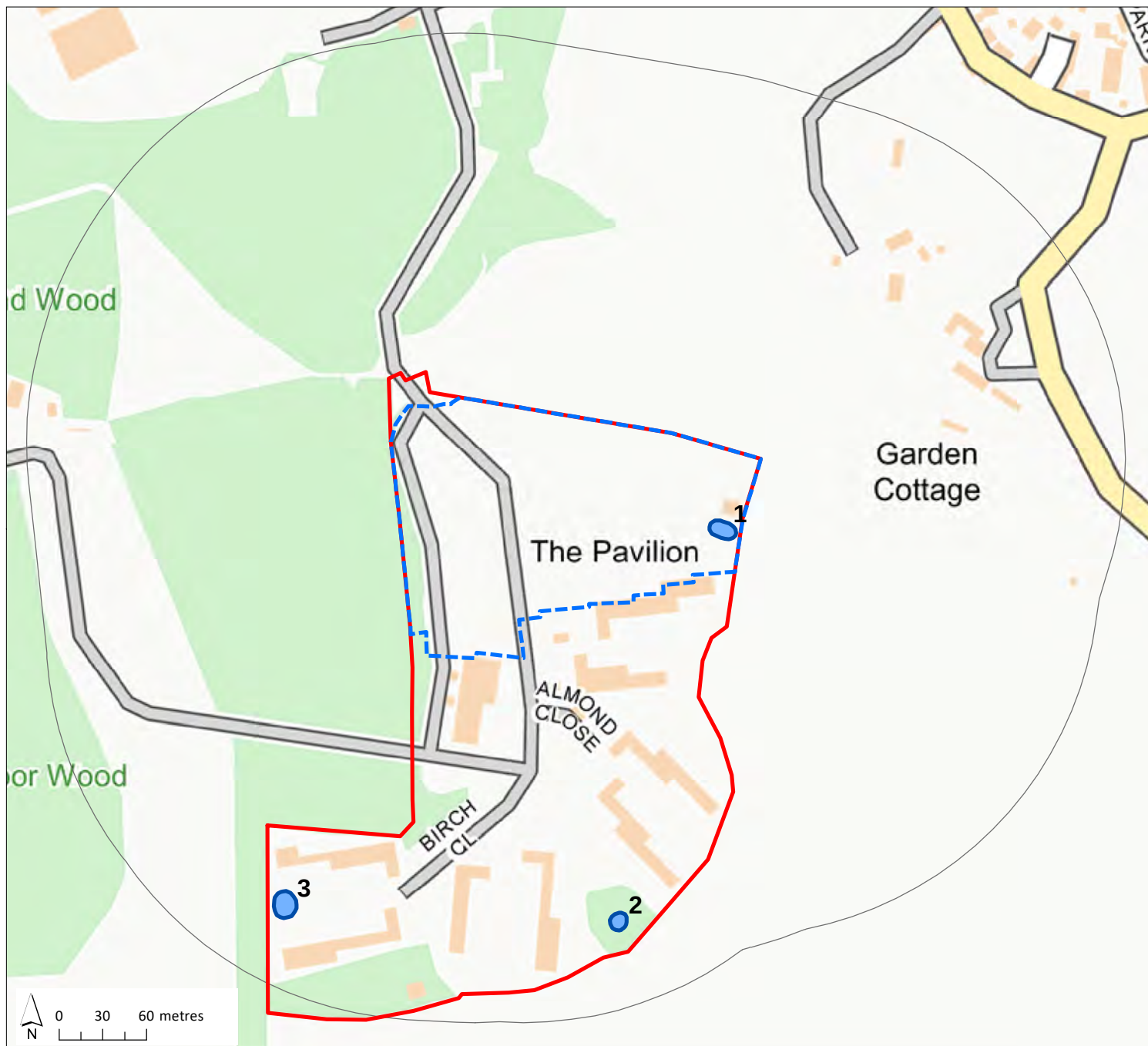
³ DAFOR: whereby species occurrence may be classified as being dominant, abundant, frequent, occasional or rare. Rare in the context of a DAFOR score should not be confused with species rarity in the more widely accepted meaning of general scarcity.



Great crested newt

- 2.15 A search for great crested newt (GCN) eggs on submerged vegetation in the three on Site ponds (see **Figure 2.2**) was completed by DP on 13 May 2022. No GCN eggs (only smooth newt eggs) were found during the inspection, and three pond water samples were taken using ADAS eDNA test kits to enable GCN presence/absence from the Site to be confirmed.
- 2.16 GCN survey of off-site ponds located within 250 m of the Site boundary was not completed or considered necessary as the proposed development area is located too far from any off-site pond to constitute a risk to GCN.





Wadswick Green

Waterbodies within 250 m

- Site boundary
- Survey Area
- 250 m from Survey Area
- waterbodies within 250 m

Figure 2.2

Map Scale @ A4: 1:4,000

Surveyed by: n/a

Survey date: n/a

Drawn by: RD

Checked by: DP

Status: Final



3 Results

Habitats and plants

- 3.1 The Phase 1 Habitat Map is shown in **Figure 3.1**.
- 3.2 The survey area was comprised mainly of recently established **semi-improved neutral grassland** on land that up until the autumn of 2021 comprised previously disturbed bare ground resulting from recent construction operations. The area had been prepared and seeded in October 2021 with a Cotswolds Seeds Ltd “*species rich parkland low maintenance*” grass seed mix⁴ which comprises an eight UK native grass seed mix without wildflowers. At the time of the survey in 2022 the grassland was in its establishment phase with area of bare ground still visible between the developing grass sward and very few flowering herbs. In February 2023 the grassland had a more developed sward and was largely devoid of bare ground areas.
- 3.3 Short sward **amenity grassland** areas were present along the edges of roadways, paths, formal planted introduced shrub beds and around the immediate curtilage of the facility buildings.
- 3.4 Small areas of non-native **introduced shrubs** were present within the survey area – including two formal planted beds at the site entrance and a linear strip of ornamental grasses to the east.
- 3.5 Areas of sealed surface **hard standing** were present as roads, formal footpaths and carparking made up a significant proportion of the survey area.
- 3.6 A small area of amenity grassland along the southern boundary of the survey area had been recently planted as an **orchard**.
- 3.7 An area of **ephemeral/short perennial** vegetation on disturbed bare ground was present in the south-west corner of the survey area between a car park and an area of amenity grassland.
- 3.8 A community allotment with raised beds on a compacted gravel **unsealed surface** area and plant nursery / **allotment** area was present in the north-east corner of the Site. A compacted hardcore **unsealed surface** maintenance yard area was present in the northwest.
- 3.9 The northern boundary was delineated by a tall garden privet *Ligustrum ovalifolium* hedge that extended roughly half way along the boundary from west to east from where the hedge was comprised a mixture of sycamore *Acer pseudoplatanus*, cherry laurel *Prunus laurocerasus*, elder *Sambucus nigra*, hawthorn *Crataegus monogyna*, silver birch *Betula pendula*, butterfly bush *Buddleia davidii*, and grey willow *Salix cinerea*. A line of mature Lawsons cypress *Chamaecyparis lawsoniana* trees with a single silver birch and adjoining scattered bramble *Rubus fruticosus* and butterfly bush extended south from the hedge.

⁴ <https://www.cotswoldseeds.com/products/1040/species-rich-parkland-grassland-low-maintenance>



- 3.10 A recently planted hawthorn dominated hedge was also present alongside a timber fence formed the southern boundary of the maintenance yard area.

Fauna

- 3.11 There was no significant evidence of protected species within the survey area.

Herpetofauna

- 3.12 No great crested newt (GCN) eggs were present in any of the three on-Site ponds, and the eDNA surveys of the three ponds all returned negative results for GCN which suggests that GCN are absent from the Site at this current time.
- 3.13 A single adult grass snake *Natrix helvetica* was disturbed next to Pond 3 during the GCN survey.

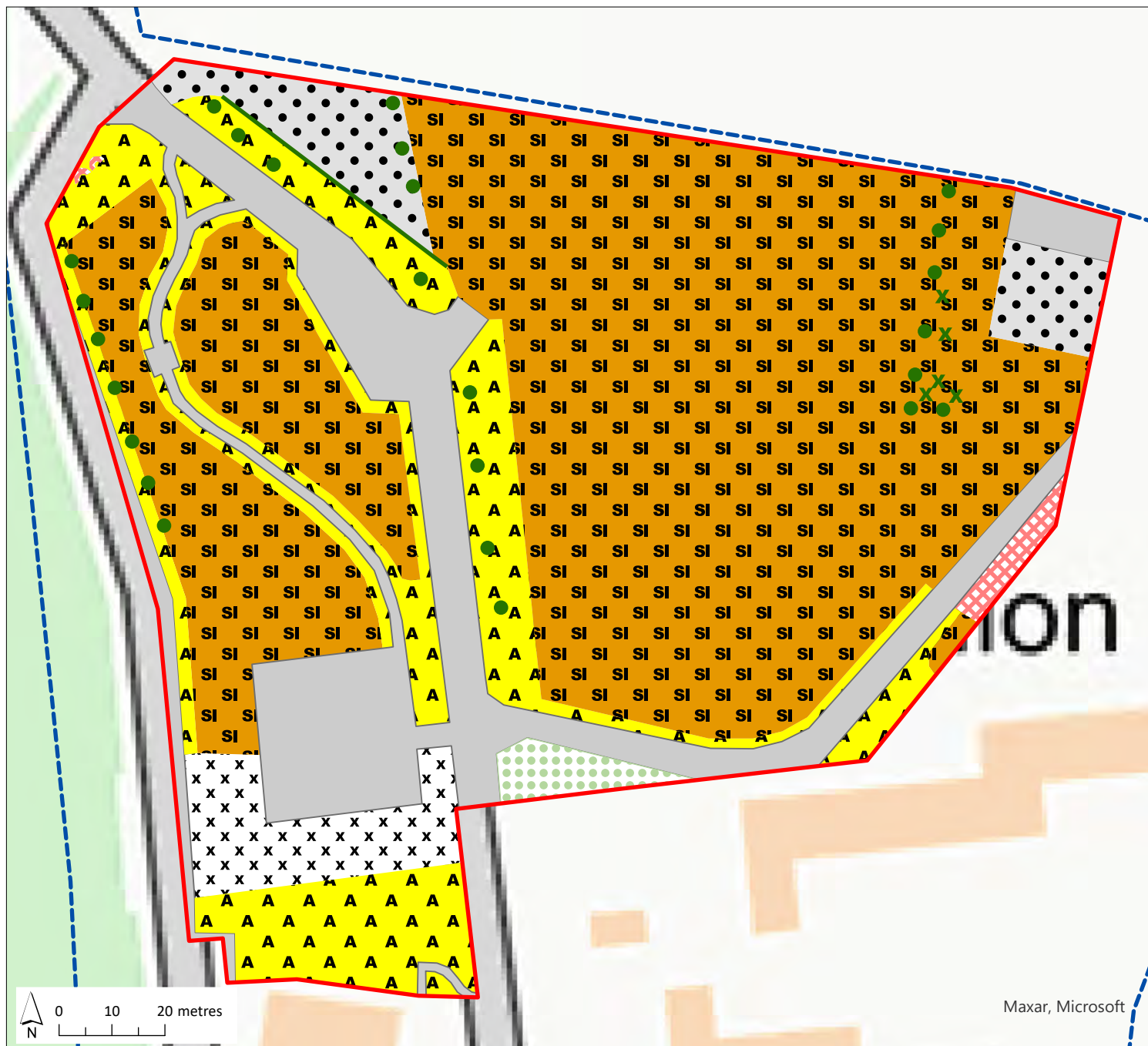
Badger

- 3.14 Two single hole disused badger setts were recorded within the survey area in February 2023. One was present within the base of the northern boundary hedge and the second in the base of the Lawson cypress / scrub line to the east of the survey area. Both were clearly long-disused setts with infilled entrances and no recent signs of badger presence.

Birds

- 3.15 A bird nest box installed on the wooden boundary fence next to the maintenance yard was in use by nesting blue tit during the survey in May 2022.
- 3.16 The mature trees and hedges within the survey area are also likely to be used by a small range of woodland and garden nesting birds, but not an assemblage of a size or species composition that would confer the Site with any particular ornithological importance.
- 3.17 A barn owl *Tyto alba* previously used the HMS Royal Arthur buildings for roosting, and two barn owl boxes (one pole and one tree mounted) have been installed near the southern boundary of Wadswick Green for the specific benefit of this species. Evidence of roosting barn owl in the form of pellets and droppings are regularly recorded in the two bat houses, but to date no evidence of use of the boxes by nesting owls has been recorded.





Wadswick Green

Phase 1 habitat map

- Phase 2C boundary
- Site boundary
- A amenity grassland
- x x x ephemeral/short perennial
- x x x introduced shrubs
- SI SI semi-improved neutral grassland
- . . . orchard
- hard-standing
- . . . unsealed surface
- hedgerow
- individual trees (indicative location)
- x scattered scrub

Figure 3.1

Map Scale @ A4: 1:1,100

Surveyed by: n/a

Survey date: n/a

Drawn by: NB

Checked by: DP

Status: Final





Photo 1 - newly established semi-improved neutral grassland



Photo 2 - amenity grassland and introduced shrubs



Photo 3 - privet hedge along northern boundary



Photo 4 - bat house, semi-improved grassland and planted native woody shrubs



Photo 5 - Pond 1 next to bat house



Photo 6 - newly planted orchard



Photo 7 - sealed surface ground and mature boundary trees



Photo 8 - allotment area



Photo 9 - ornamental grass introduced shrub area



Photo 10 - maintenance yard sealed surface



Photo 11 - northern privet hedge (left) chain link northern boundary fence (right)



Photo 12 - planted hawthorn hedge

4 Development Implications and Recommendations

Development Implications

Habitats

- 4.1 Construction of the new apartment buildings within Phase 2C will result in the replacement of mainly recently planted semi-improved neutral grassland with building and hard standings and will not necessitate the loss of any tree.
- 4.2 The loss of recently established grassland habitat is a minor adverse ecological impact that can be compensated by additional planting elsewhere in the wider site as recommended below.

Fauna

- 4.3 The proposed construction and operation of Phase 2C is unlikely to result in any direct adverse impact on any protected faunal species as the construction area is comprised of recently established grassland that lacks protected fauna interest.

Badgers

- 4.4 Badgers are known to occur locally, and although no active setts occur within or close to the Phase 2C construction site, it is feasible that badgers could access the construction area at night from off-Site locations and potentially become trapped in open excavations or exposed pipework. Mitigation measures with respect to minimising construction related risk to badgers are recommended below.

Nesting birds

- 4.5 It appears unlikely that site clearance to enable construction of Phase 2C will necessitate the removal of any cover vegetation that would be suitable for nesting birds. However, any unforeseen removal of trees, scrub or hedgerow habitat associated with Phase 2C construction will necessitate mitigation measures to be implemented as recommended below.

Bats

- 4.6 The Phase 2C land area previously comprised cleared ground that was in use as a construction compound, temporary construction car parking and soil storage area until it was prepared and grass seeded in 2022. This land has not provided important bat forage or commuting habitat at any point since the Wadswick Green horseshoe bat colony took up residence in the new bat houses in 2014, and has always been identified as a location for residential accommodation in the Natural England EPSM bat licence for the Site.
- 4.7 The replacement of the newly established grassland with buildings and hard standings within the Phase 2C area is highly unlikely to adversely impact the integrity of the



Wadswick Green horseshoe bat colony in terms of either loss of bat forage habitat or loss of bat commuting access across the Site. The only development risk to the bat colony relates to increases in after dark lighting of the Site within and immediately around the Phase 2C area which could theoretically result in adverse impacts on horseshoe and other light sensitive bat species by displacing bats from the area.

- 4.8 It is understood that the same low key (bat friendly) lighting strategy that has been used to illuminate footpaths and buildings in the wider site will be adopted for Phase 2C, and therefore adverse lighting impacts on bats are not predicted to occur as a result of the Phase 2C development. We note that unilluminated trees and hedge lines around the periphery of the Site will remain unilluminated and provides bat habitat connectivity between the two bat houses and wider off-site woodland areas. Recommendations to strengthen this habitat connectivity for the benefit of bats and other wildlife is set out below.

Recommendations

Mitigation measures

- 4.9 The following ecological mitigation recommendations in relation to protected species known to be present on or close to Site are outlined below in relation to the Phase 2C proposals:
- All below ground excavations should be suitably covered or ramped overnight to prevent badger access or allow safe badger egress.
 - Exposed pipework should be capped at night to prevent badger access;
 - Any necessary tree, scrub or hedge removal should be completed outside of the recognised nesting period of March to August. If this is not practicable a check by an experienced ecologist/ornithologist that verifies the absence of nesting birds and their dependent young will be required at other times.
 - The development should be subject to minimal permanent after dark lighting that is in line with the wider bat friendly lighting strategy for Wadswick Green in the interests of maintaining the Site as a largely dark environment for light sensitive horseshoe bat species that forage and roost within the wider development. Any essential lighting should be on motion sensors, low level and downward projecting to minimise light spill and adverse impacts on bats.

Biodiversity enhancement measures

- 4.10 It is recommended that the eastern boundary of the Wadswick Green site is supplementary planted with a mixed native woodland trees and shrubs in a belt adjoining the eastern boundary fence and connecting the northern and southern bat house to strengthen the tree canopy connection between the two bat houses.



Appendix 1

Bat house and barn owl box locations





Key

Northern bat house - central grid reference - ST 85269 68416
Southern bat house - central grid reference - ST 85054 68083
Tree mounted barn owl box - ST 85095 68097
Pole mounted barn owl box - ST 85029 68081



Appendix 2

Great crested newt eDNA results



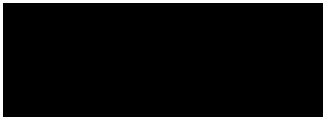
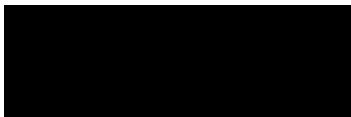
Client: Duncan Painter,
Applied Ecology Ltd.



ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

Tel: 01159 229249
Email: Helen.Rees@adas.co.uk
www.adas.uk

Sample ID: ADAS-3983 Condition on Receipt: Good Volume: Passed
Client Identifier: Wadswick Green Pond 3 Description: pond water samples in preservative
Date of Receipt: 23/05/2022 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	24/05/2022
Degradation Control [§]	Within Limits	Real Time PCR	24/05/2022
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	24/05/2022
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN
Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	25/05/2022	Date of issue:	25/05/2022

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

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Sample ID: ADAS-3984 Condition on Receipt: Good Volume: Passed
Client Identifier: Wadswick Green Pond 2 Description: pond water samples in preservative
Date of Receipt: 23/05/2022 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	24/05/2022
Degradation Control [§]	Within Limits	Real Time PCR	24/05/2022
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	24/05/2022
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:



Signed:



Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 25/05/2022 Date of issue: 25/05/2022

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Tel: 01159 229249
Email: Helen.Rees@adas.co.uk
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Sample ID: ADAS-3987 Condition on Receipt: Low Sediment Volume: Passed
Client Identifier: Wadswick Green Pond 1 Description: pond water samples in preservative
Date of Receipt: 23/05/2022 Material Tested: eDNA from pond water samples

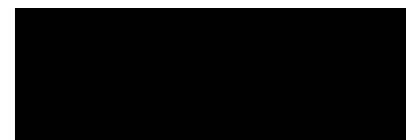
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Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:



Signed:



Position: Director: Biotechnology Position: MD: Biotechnology

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

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[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

Appendix 1: Interpretation of results

Sample Condition

Upon sample receipt we score your samples according to quality: good, low sediment, medium sediment, high sediment, white precipitate, and presence of algae.

There are three reasons as to why sediment should be avoided:

1. It is possible for DNA to persist within the sediment for longer than it would if it was floating in the water which could lead to a false positive result i.e. in this case GCN not recently present but present a long time ago
2. In some cases sediment can cause inhibition of the PCR analysis used to detect GCN eDNA within samples which could lead to an indeterminate result.
3. In some cases sediment can interfere with the DNA extraction procedure resulting in poor recovery of the eDNA which in turn can lead to an indeterminate result.

Algae can make the DNA extraction more difficult to perform so if it can be avoided then this is helpful.

Sometimes samples contain a white precipitate which we have found makes the recovery of eDNA very difficult. This precipitate can be present in such high amounts that it interferes with the eDNA extraction process meaning that we cannot recover the degradation control (nor most likely the eDNA itself) at sufficient levels for the control to be within the acceptable limits for the assay, therefore we have to classify these type of samples as indeterminate.

What do my results mean?

A positive result means that great crested newts are present in the water or have been present in the water in the recent past (eDNA degrades over around 7-21 days).

A negative result means that DNA from the great crested newt has not been detected in your sample.

On occasion an inconclusive result will be issued. This occurs where the DNA from the great crested newt has not been detected but the controls have indicated that either: the sample has been degraded and/or the eDNA was not fully extracted (poor recovery); or the PCR inhibited in some way. This may be due to the water chemistry or may be due to the presence of high levels of sediment in samples which can interfere with the DNA extraction process. A re-test could be performed but a fresh sample would need to be obtained. We have successfully performed re-tests on samples which have had high sediment content on the first collection and low sediment content (through improved sample collection) on the re-test. If water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

The results will be recorded as indeterminate if the GCN result is negative and the degradation result is recorded as:

1. evidence of decay - meaning that the degradation control was outside of accepted limits
2. evidence of degradation or residual inhibition - meaning that the degradation control was outside of accepted limits but that this could have been due to inhibitors not being removed sufficiently by the dilution of inhibited samples (according to the technical advice note)

