



EDNA AND REPTILE SURVEY REPORT

**WARWICK NURSERY, EASTERGATE LANE,
BARNHAM**

Prepared by	GS
Checked by	JJ
Date	15 th July 2020
Project Reference	LLD1995
Revision	00

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SUMMARY

Lizard Landscape Design and Ecology has been commissioned by Landacre Developments Ltd to undertake Phase 2 Reptile and GCN eDNA surveys of land at Warwick Nursery, Barnham Road, Eastergate (*Grid Reference SU949051 – hereafter referred to as 'the site'*).

A Preliminary Ecological Appraisal (*PEA*) was undertaken of the site in October 2019 by Phlorum Ltd. Further reptile and GCN surveys were recommended due to suitable habitats being present on site for these protected species. These further surveys were undertaken between April-July 2020.

Only 3 no. waterbodies were found within 500.0 m of the site; only one of these was accessible for further survey. This waterbody consisted of a ditch running past the southern boundary and culminating in a small pond. An eDNA survey of the pond gave a negative result for GCN. The proposed development is considered to stand a negligible risk of contravening the Conservation of Habitats and Species Regulations 2017 (as amended).

Phase 2 reptile surveys of the grassland and tall ruderal vegetation revealed a 'moderate' population of slow worms on the site. Appropriate mitigation measures have been proposed to preserve the local slow worm population and avoid contravention of the *Wildlife and Countryside Act (As Amended) 1981*.

No further ecological surveys are required at the site.

1.0 INTRODUCTION

- 1.1 Lizard Landscape Design and Ecology has been commissioned by Landacre Developments Ltd to undertake Phase 2 Reptile and GCN eDNA surveys of land at Warwick Nursery, Barnham Road, Eastergate (Grid Reference SU949051 – hereafter referred to as ‘the site’).
- 1.2 A Preliminary Ecological Appraisal (PEA) was undertaken of the site in October 2019 by Phlorum Ltd. Further reptile and GCN surveys were recommended due to suitable habitats being present on site for these protected species. These further surveys were undertaken between April-July 2020.
- 1.3 This report has been prepared by George Sayer (*MCIEEM, Senior Ecologist; Lizard Landscape Design and Ecology*). The report has been reviewed by Joe Jackson (*Director; Lizard Landscape Design and Ecology*).

Site Information

- 1.4 The survey area covers c. 1.8 Ha of existing grassland paddocks, surrounded by hedges, trees and an access track. The site is level and roughly rectangular. The site is part of the linear development between Eastergate and Barnham, with arable fields to the south and the Barnham Road to the north.

Surrounding Landscape

- 1.5 The surrounding landscape is relatively rural, with the immediate surroundings being that of the linear residential areas of Barnham, Eastergate and Westergate.
- 1.6 Only 2 no. ponds were found within 500.0 m of the site; only one of these (*Pond P1*) was accessible for further survey. This waterbody consisted of a ditch running past the southern boundary and culminating in a small pond. The pond was considered potentially suitable for GCN.

Development Proposals

- 1.6 The proposals are for a residential development, with associated access road, parking areas, gardens and open space. The proposals would encompass the entirety of the site.

2.0 SCOPE OF THE SURVEY

- 2.1 The aim of the survey has been:

- To assess the suitability of the site for reptiles and amphibians;
- To identify whether GCN are present in the immediate vicinity;
- To identify whether reptiles are present on the site; their species and population size classes;
- To provide suitable mitigation measures if required.

3.0 METHODOLOGY

3.1 Desk Study

- 3.1.1 The Multi-Agency Geographical Information Centre (*MAG/C*) was consulted in association with Ordnance Survey mapping to establish the location of ponds in the local area.

3.2 GCN eDNA Survey

- 3.2.1 Only 3 no. waterbodies were found within 500.0 m of the site; only one of these was accessible for further survey. This waterbody consisted of a ditch running past the southern boundary and culminating in a small pond. A water sample of Pond P1 was taken in accordance with Natural England Guidelines by a trained ecologist on 1st May 2020 and sent to Surescreen Scientifics for analysis.

3.3 Reptile Survey

- 3.3.1 34 no. artificial reptile refugia (*roofing felt; 0.50 x 1.0 m²*) were laid out around the site on 1st May 2020 and allowed to settle for 17 days prior to commencement of the survey.

- 3.3.2 07 no. site visits were conducted, where the number, species, age and sex of the reptiles' present were recorded.
- 3.3.3 Surveys were undertaken where possible during recommended times (08:00–11:00 and 16:00–18:30) with suitable weather conditions for surveying reptiles (*guidelines recommend temperatures 9–18°C with intermittent or hazy sunshine during warm days*). Weather conditions recorded at each survey visit are shown in Table No. 02 below

Table No. 01 - Details of Weather Conditions during the Reptile Surveys

Survey	Date of Visit	Time	Weather	Temperature	Wind
1	18.05.2020	10:00	Light Cloud	16°C	1
2	26.05.2020	09:00	Clear & Sunny	17°C	0
3	02.06.2020	10:00	Clear & Sunny	18°C	1
4	17.06.2020	18:00	Overcast	18°C	1
5	19.06.2020	11:00	Overcast	16°C	3
6	23.06.2020	10:00	Light Cloud	16°C	1
7	10.07.2020	00:00	Clear & Sunny	17°C	0

3.4 Limitation and Constraints

- 3.4.1 The site was heavily mown and strimmed immediately prior to the commencement of the reptile survey, severely limiting areas of suitable habitat for the survey.
- 3.4.2 The habitats on-site had regrown by the end of the survey. Given that a 'moderate' slow worm population was found on site, the vegetation works may have slightly reduced overall number of reptiles found but are not considered to have significantly altered the broader survey findings or mitigation recommendations.

4.0 RESULTS

4.1 GCN eDNA Survey

- 4.1.1 The eDNA sample of Pond P1 taken on 1st May 2020 was analysed by Surescreen Scientifics, with a negative result (0 positive replicates). It is highly unlikely that GCN are present within or have passed through this waterbody, and therefore the likelihood of GCN being present on site is considered extremely low (Refer to Appendix A - eDNA Analysis Report)

4.2 Reptile Survey

- 4.2.1 Reptile surveys identified a '*moderate*' population of slow worms using the site. These were spread around the site boundaries to all aspects. A peak count of 14 no. slow worms, including 11 no. adults was recorded on 10th July 2020. The results of the surveys are detailed below:

Table No. 02 – Summary of Reptile Survey Results

Visit No.	SW	GS	CL	A
1	1	0	0	0
2	1	0	0	0
3	3	0	0	0
4	1	0	0	0
5	13	0	0	0
6	3	0	0	0
7	14	0	0	0
Peak Count	14	0	0	0

SW= Slow Worm, GS= Grass Snake, CL= Common Lizard, A= Adder

5.0 EVALUATION

- 5.1 It is considered highly unlikely that GCN are present in the immediate vicinity or are using the site. Proposals are highly unlikely to contravene the Conservation of Habitats and Species Regulations 2017 (as amended). The mitigation measures recommended for reptiles (*below*) would ensure that, in the highly unlikely event of GCN being present on site, these would not be harmed and would be discovered pre-development, whereby appropriate actions could be taken.
- 5.2 The site contains a '*moderate*' population of slow worms; these are generally limited to boundaries and patches of ruderal vegetation in the centre of the site. In the absence of mitigation these reptiles would likely be killed or injured by the proposals, contravening the *Wildlife and Countryside Act (as amended) 1981*.

6.0 REPTILE MITIGATION

- 6.1 A reptile fencing translocation exercise will be undertaken to protect slow-worms and provide compensatory habitat. Temporary reptile / amphibian exclusion fencing would be installed around the construction zone to prevent movement of reptiles into this area. The reptile exclusion fencing will be 750 mm in height and constructed using 1000-gauge UV-treated polythene fixed to 50 x 50 mm stakes and buried 100 mm underground. A trench will be excavated to a depth of approximately 250 mm; the fence sheet laid around the edge and the trench back filled.
- 6.2 The above works would be conducted under the supervision of a suitably qualified ecologist to ensure the welfare of any reptile / amphibian species that may otherwise be adversely affected. The fencing would be maintained for the duration of the construction period and until all works have been completed on site. Fencing would be checked on a regular basis and repaired where necessary as soon as possible.
- 6.3 Following the erection of fencing a translocation exercise would be conducted of all reptiles / amphibians within the construction zone prior to commencement of any site clearance / construction. Additional reptile refugia would be deployed within the construction zone and site visits undertaken in suitable weather conditions during the reptile active season (*March-October inclusive*). Any reptiles encountered would be stored in cloth bags and translocated to a suitable receptor site.
- 6.4 The receptor areas would consist of sections of the site to be retained as public open space, notably the area surrounding the southern boundary where a continuous open space backs onto trees and hedges. This area is considered sufficient to support a 'moderate' population of reptiles during the short-medium term. Post-construction, other areas of open space would be made suitable to enable the reptile population to re-colonise and be sustained in the site over the long-term.

- 6.5 The translocation exercise would continue until 5 no. visits have been completed under optimum survey conditions in which no reptiles are identified. Following this, a destructive search of the site would take place to ensure the site is clear of all reptiles and to render the site unsuitable for re-colonisation.
- 6.6 All logs / rubble / compost piles are to be removed by hand while vegetation will be cleared in a staggered fashion. The initial cut will reduce the vegetation to a height of approx. 15cm with subsequent cuts reducing vegetation to a height of <5cm. All vegetation removal will be supervised by a suitably qualified ecologist and will be undertaken during the reptile active season (*March-September inclusive*).
- 6.7 Should there be a delay between the destructive search and commencement of construction activities, it is essential that any vegetation on site be kept short (< 5cm) and the integrity of the temporary reptile fencing be maintained.
- 6.8 The above mitigation strategy is considered to be proportionate to the development proposals while ensuring the avoidance of any amphibian / reptiles which may be present on the site.

7.0 CONCLUSIONS

- 7.1 The site is highly unlikely to contain GCN and no further specific mitigation is required for this species. The proposed development is considered to stand a negligible risk of contravening the *Conservation of Habitats and Species Regulations 2017 (as amended)*. The site contains a 'moderate' population of slow worms. The mitigation specified within this report will safeguard the population of slow worms within the site and ensure the proposals do not contravene the *Wildlife and Countryside Act (As Amended) 1981*. No further ecological surveys are required at the site.

8.0 REFERENCES

ARG UK: Advice Note 5: Great Crested Newt Habitat Suitability Index (2010);

Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001), Great Crested Newt Conservation Handbook, Froglife, Halesworth;

Natural England (2015); Great Crested Newts: Surveys and Mitigation For Development Projects. Available Online: <https://www.gov.uk/guidance/great-crested-newts-surveys-and-mitigation-for-development-projects>

Appendix A – Surescreen Scientifics eDNA Analysis Report

Folio No: E7220
Report No: 1
Purchase Order: LLD1995
Client: LIZARD LANDSCAPE DESIGN
Contact: George Sayer

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: 06/05/2020
Date Reported: 10/05/2020
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
1853	Upton Brooks	SU 95200 04846	Pass	Pass	Pass	Negative	0

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

Reported by: Chris Troth

Approved by: Sarah Evans



Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE

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.



Appendix B – Full Reptile Survey Results

Appendix B - Full Reptile Survey Results

Visit No. 01

Surveyor	George Sayer			
Date	18.05.2020			
Time	10:00			
Temperature	16°C			
Wind (Beaufort)	1			
Weather	Light Cloud			
Tile No.	Species	Ad/J	Sex	Notes
33	Slow Worm	Adult	Male	

Visit No. 02

Surveyor	George Sayer			
Date	26.05.2020			
Time	09:00			
Temperature	17°C			
Wind	0			
Weather	Clear & Sunny			
Tile No.	Species	Ad/J	Sex	Notes
22	Slow Worm	Adult	Female	

Visit No. 03

Surveyor	George Sayer			
Date	02.06.2020			
Time	10:00			
Temperature	18°C			
Wind	1			
Weather	Clear & Sunny			
Tile No.	Species	Ad/J	Sex	Notes
28	Slow Worm	Adult	Male	
10	Slow Worm	Juvenile	Unknown	
11	Slow Worm	Adult	Female	

Visit No. 04

Surveyor	George Sayer			
Date	17.06.2020			
Time	18:00			
Temperature	18°C			
Wind	1			
Weather	Overcast			
Tile No.	Species	Ad/J	Sex	Notes
25	Slow Worm	Adult	Female	

Appendix B - Full Reptile Survey Results

Visit No. 05

Surveyor	George Sayer			
Date	19.06.2020			
Time	11:00			
Temperature	16°C			
Wind	3			
Weather	Overcast			
Tile No.	Species	Ad/J	Sex	Notes
25	Slow Worm	Adult	Female	
25	Slow Worm	Adult	Female	
25	Slow Worm	Adult	Female	
25	Slow Worm	Adult	Female	
22	Slow Worm	Adult	Female	
31	Slow Worm	Juvenile	Unknown	
9	Slow Worm	Adult	Female	
10	Slow Worm	Juvenile	Unknown	
11	Slow Worm	Adult	Female	
27	Slow Worm	Adult	Female	
12	Slow Worm	Juvenile	Unknown	
13	Slow Worm	Juvenile	Unknown	
20	Slow Worm	Juvenile	Unknown	

Visit No. 06

Surveyor	George Sayer			
Date	23.06.2020			
Time	10:00			
Temperature	16°C			
Wind	1			
Weather	Light Cloud			
Tile No.	Species	Ad/J	Sex	Notes
30	Slow Worm	Adult	Female	
31	Slow Worm	Adult	Male	
21	Slow Worm	Adult	Female	

Appendix B - Full Reptile Survey Results

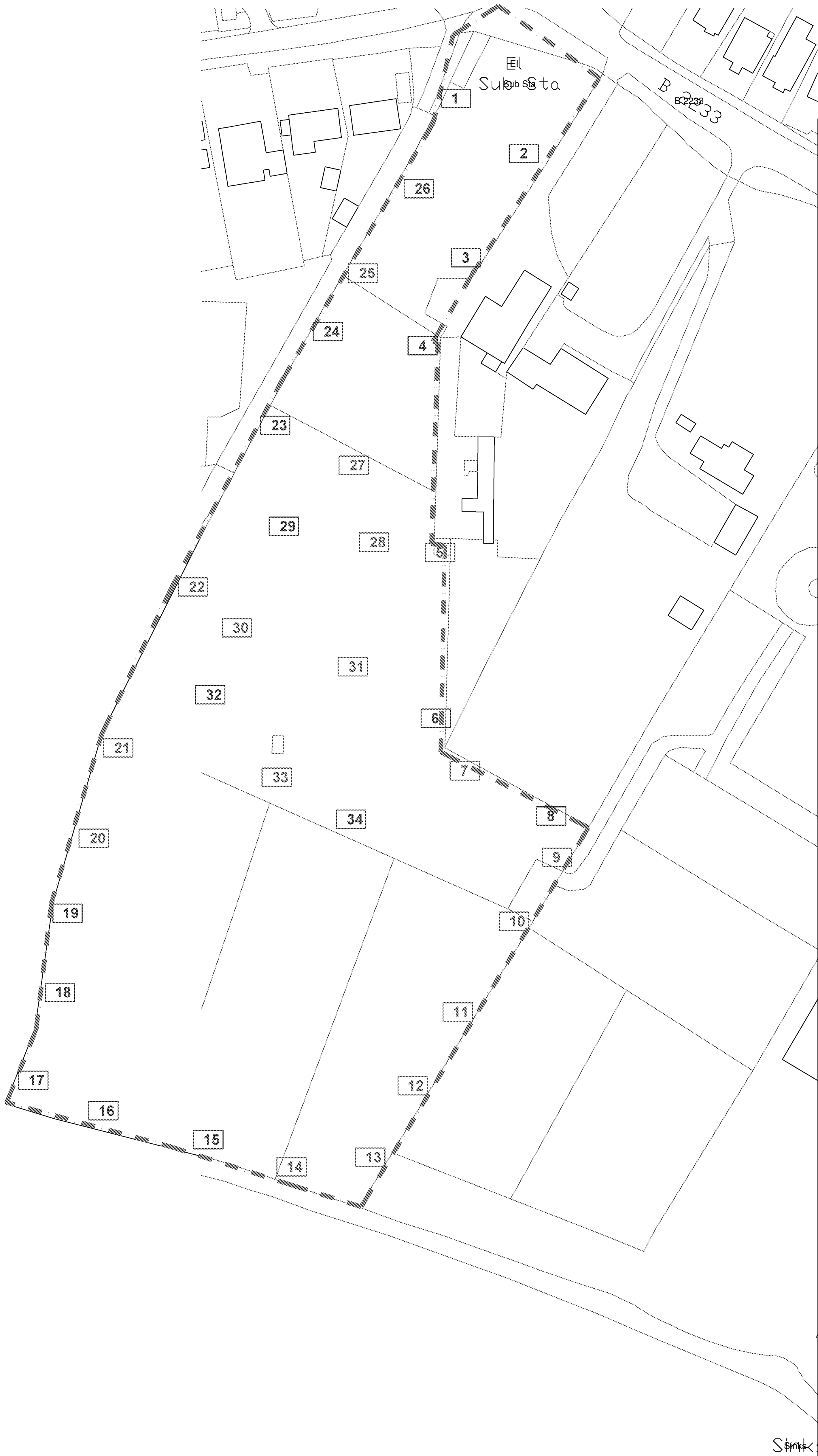
Visit No. 07

Surveyor	George Sayer			
Date	10.07.2020			
Time	09:30			
Temperature	17°C			
Wind	0			
Weather	Clear & Sunny			
Tile No.	Species	Ad/J	Sex	Notes
30	Slow Worm	Adult	Male	
30	Slow Worm	Adult	Male	
31	Slow Worm	Adult	Female	
7	Slow Worm	Juvenile	Unknown	
12	Slow Worm	Adult	Female	
14	Slow Worm	Adult	Male	
21	Slow Worm	Juvenile	Unknown	
21	Slow Worm	Adult	Female	
21	Slow Worm	Adult	Unknown	
21	Slow Worm	Adult	Male	
5	Slow Worm	Juvenile	Unknown	
5	Slow Worm	Adult	Male	
5	Slow Worm	Adult	Female	
5	Slow Worm	Adult	Female	

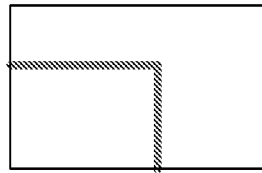
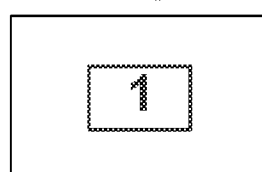
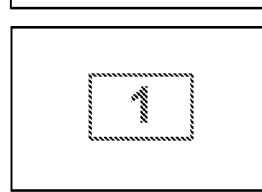
Summary:

Visit No.	SW	GS	CL	A
1	1	0	0	0
2	1	0	0	0
3	3	0	0	0
4	1	0	0	0
5	13	0	0	0
6	3	0	0	0
7	14	0	0	0
Peak Count	14	0	0	0

SW= Slow Worm, GS= Grass Snake, CL= Common Lizard, A= Adder

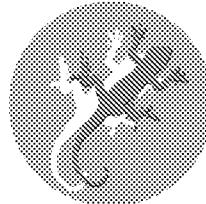


Legend

-  Site Survey Boundary.
-  Location of Artificial Reptile Refugia.
-  Location of Artificial Reptile Refugia - Protection Species of Slow Worm recorded.

PLANNING ISSUE

Rev	Description	Date	Initials
00	Planning Issue	15.07.20	GS



LIZARD

Landscape Design and Ecology

The Old Bank, 34 South Street, Tarring, Worthing, West Sussex, BN14 7LH
T. 01903 216033 E. lizardlandscape@btconnect.com W. lizardlandscapeecology.com

Project Title and Location
Warwick Nursery
Client
Landacre Developments Ltd

Drawing Title
Figure No.01- Location of Reptile Refugia
Barnham Road, Eastergate

Scale 1:500@A1	Drawn GS Approved JJ	Date 15.07.20
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Drawing No LLD1995-ECO-FIG-001	Revision 00
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Figure No.01 - Location of Reptile Refugia
Warwick Nursery, Barnham Road, Eastergate



Scale 1:250
0 1 2.5 5 10 m



(c) Crown Copyright and database rights 2020. Ordnance Survey 100022861.

Legend

- Development Site Boundary.
- Pond.
- Pond Number.
- 500m Buffer.

Planning Issue

Rev	Description	Date	Initials
00	Planning Issue	15.07.20	GS

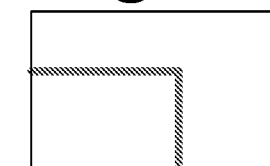


Client Landcare Developments Ltd Project Title and Location Warwick Nursery Barnham Road, Eastergate	Drawing Title Location of Ponds Plan Figure No. 02	Scale 1:2000@A0	Drawn GS	Approved JJ	Date 15.07.20	Revision 00
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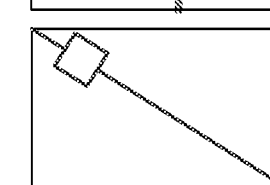
Figure No. 02 - Location of Ponds Plan
Warwick Nursery, Barnham Road, Eastergate



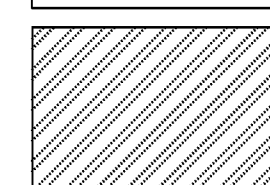
Legend



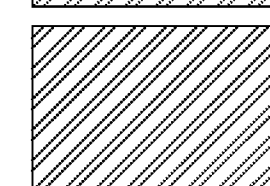
Site Survey Boundary.



**Indicative Location
of Temporary
Reptile Fencing.**



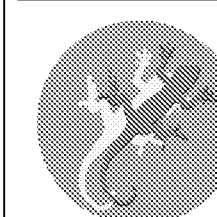
Location of Reptile Receptor Area During Construction.



Areas to be Managed for Reptiles Post-Construction.

PLANNING ISSUE

Rev	Description	Date	Initials
00	Planning Issue	15.07.20	GS



L I Z A R D
Landscape Design and Ecology

The Old Bank, 34 South Street, Tarring, Worthing, West Sussex, BN14 7LH
T. 01903 216033 E. lizardlandscape@btconnect.com W. lizardlandscapeecology.com

Project Title and Location
Warwick Nursery
Client
Landacre Developments Ltd

Drawing Title		
Figure No.03-Proposed Reptile Mitigation Plan Barnham Road, Eastergate		
Scale	Drawn	Date
1:500@A1	GS	15.07.20
	Approved	
	J.I	

Drawing No	Revision
LLD1995-ECO-FIG-003	00
CAD Filename	
LLD1995/CAD/ECO	

**Figure No.3 - Proposed Reptile Mitigation Plan
Warwick Nursery, Barnham Road, Eastergate**