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Reptile and Great Crested Newt Survey Report

Land South of Lyne House, Worthing

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Report Summary

1. Mr Tim Rodway commissioned The Ecology Co-op to undertake a reptile presence/absence survey and eDNA analysis of a pond on land south of Lyne House, Worthing between the start of July and end of August to ascertain if any reptiles and/or great crested newts are present on the site. This was completed following a Preliminary Ecological Appraisal carried out by The Ecology Co-op on the 10th June 2022, which identified suitable habitat for reptiles at the site and a pond adjacent to the site.
2. These surveys were undertaken by Nick Bayne, MSci, a qualifying member of the Chartered Institute for Ecology and Environmental Management (CIEEM).
3. The site comprises a garden with amenity grassland that has been managed to varying degrees. Mature beech trees line the western boundary that shade most of this area. The southern boundary comprises of scrub and a linear log pile. The eastern boundary comprises a hedgerow of varying composition with a large beech tree at the southern end. A small pond is present adjacent to the north-west corner of the red line boundary, but much of the suitable terrestrial habitat associated with this pond is contained within the redline boundary.
4. The reptile survey was carried out by placing 13 artificial refugia in suitable areas across the site. These were left to 'bed in' for a minimum of ten days, followed by a total of seven survey visits during suitable weather conditions at appropriately spaced intervals.
5. Slow worms were identified across the site but were mostly found around the south-western corner. A peak count of nine slow worms was recorded. This species may be directly harmed by the works and there will be a loss of suitable habitat on site as a result of the proposals.
6. Therefore, prior to any work commencing the site will need to be fenced off, using reptile fencing to ensure no further reptiles can enter. The slow worms present will then be translocated from the site to a suitable receptor site.
7. A sample of water was taken from the pond adjacent to the northern boundary, and analysed for great crested newt eDNA. The sample was returned negative meaning the pond does not support great crested newts. Therefore, this species is highly unlikely to be found on site at any time and no further mitigation regarding great crested newts will be necessary.



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1 INTRODUCTION

1.1 Purpose of the Report

This report provides the results of a reptile presence/likely absence survey on Land south of Lyne House between 4th July to 26th August, and an eDNA survey of a pond directly adjacent to the north-western corner of the site. This was carried out by Nick Bayne, Msci, a qualifying member of CIEEM.

The purpose of the reptile survey is to identify the presence or likely absence of reptile species at the site and if present, determine approximate population size of reptile species to provide tailored mitigation and compensation measures, should they be necessary. The purpose of the eDNA test is to determine the presence/likely absence of great crested newts within waterbodies.

These surveys and report were carried out and produced at the request of Mr Tim Rodway.

1.2 Background

The Ecology Co-op was commissioned to undertake a reptile presence/absence survey and great crested newt eDNA survey at land south of Lyne House, Worthing after suitable habitat for these species was identified on the site during a Preliminary Ecological Appraisal undertaken on 10th June 2022 by The Ecology Co-op¹.

The site itself is located just south of Lyne House, Links Road, Worthing, West Sussex, BN14 9QY. The site measure 0.2ha and is in an urban area surrounded by housing and associated gardens on all sides. The approximate site boundaries are shown in Figure 1. The site comprises mostly of amenity grassland that is managed to varying degrees (Photograph 1). The southern section of the site is more overgrown with a linear log pile running along this boundary, this section is the most botanically diverse with many forb species present (Photograph 2). The western section of the site is shaded by several mature beech trees with some scrub habitat on the edges but is less diverse and valuable than the southern section. A small pond is present adjacent to the north-western boundary (Photograph 3), this has a large proportion of its associated terrestrial habitat located within the red line boundary and so was subject to eDNA analysis. The southern and western sections of the site are most suitable for reptiles and amphibians; however, the species were identified throughout the site.

The assessment was carried out further to a proposal to construct two dwellings in the northern area of the application site with associated hard and soft landscaping. This proposal will involve the removal of the vast majority of suitable reptile and amphibian habitat leaving the mature trees and hedgerows while creating more hedgerow in the north and south of the site. **Error! Reference source not found.** below outlines the plans.

¹ The Ecology Co-op (2022) Preliminary Ecological Appraisal – Land South of Lyne House, Worthing



Figure 1. An aerial image showing the location of land south of Lyne House, Worthing. The approximate site boundary is outlined in red. Image produced courtesy of Google Earth (map data ©2022 Google).



Figure 2. Proposed development layout plan for two new residential dwellings south of Lyne House, Worthing. Image courtesy of Architectural Design LLP, drawing number 2194(11)001. Right, red line indicates redline



boundary for the site and the blue outline indicates the new boundary for Lyne House.



Photograph 1. Amenity grassland making up the majority of the site, with three Portuguese laurels breaking up the area, and many forbs present.



Photograph 2. (Left) The southern area of the site seen from the western end, showing the overgrown scrub habitat containing many forb species. (Right) The log pile made of felled cypress trees on the southern boundary, seen from the eastern end of the boundary.



Photograph 3. The pond adjacent to the north-western boundary as seen from the south.

2 LEGAL PROTECTION

This section briefly describes the legal protection afforded to reptiles and great crested newts. It is for information only and is not intended to be comprehensive or to replace specialised legal advice. It is not intended to replace the text of the legislation, but simply summarises the salient points.

Common lizard *Zootoca vivipara*, grass snake *Natrix helvetica*, slow-worm *Anguis fragilis*, and adder *Vipera berus* are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), in respect of Section 9 (5) and part of Section 9(1). This protection was extended by the Countryside and Rights of Way (CroW) Act 2000. Under the legislation it is an offence to:

- Intentionally or deliberately kill or injure any individual of these species; or
- Sell or attempt to sell any part of these species either alive or dead.

Additionally, two rarer reptile species in the UK including sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca* are European Protected species protected under Section 41 of the Conservation of Habitats and Species Regulations 2010 and subsections 9(4) and 9(5) of the Wildlife and Countryside Act 1981(as amended). This prohibits the following:

- Deliberate capturing, injuring or killing;
- Deliberate disturbance;



- Deliberate taking or destroying of eggs;
- Damaging or destroying a breeding site; or
- Selling or attempt to sell or exchange any part of these species either alive or dead.

Great crested newts are fully protected under UK and European legislation:

- Bern Convention 1979: Appendix II Strictly Protected Fauna Species
- Wildlife & Countryside Act (as Amended) 1981
- The Conservation of Habitats and Species Regulations 2017 (Regs) (The Conservation of Habitats and Species Regulations 2017 transposes into UK law the EU Habitats Directive Council Directive 92/43/EEC)
- Countryside Rights of Way Act 2000 (CRoW 2000)

It is against the law to:

- capture, kill, disturb or injure great crested newts deliberately
- damage or destroy a breeding or resting place
- obstruct access to their resting or sheltering places (deliberately or by not taking enough care)
- possess, sell, or transport live or dead newts, or parts of them
- take great crested newt eggs from their breeding place

3 METHODOLOGY

3.1 Reptiles

The common lizard, slow-worm, grass snake and adder are widespread species that can be found in many semi-natural habitats, such as rough grassland, scrub, heathland and open woodland where there is good vegetation cover, an abundance of invertebrate, amphibian or small mammal prey and areas of open ground for basking.

Standard reptile presence/likely absence surveys involve setting out artificial refugia (reptile 'mats' or 'tins') in potentially suitable habitat. Reptile mats are pieces of roofing bitumen felt and reptile tins are pieces of corrugated metal sheet approximately 1m x 0.5m in size, which absorb heat from the sun more rapidly than the surrounding vegetation and provide cover and basking places attractive to reptiles. These are then checked for presence of animals under suitable weather conditions. They are placed in areas of potentially suitable habitat at an approximate density of 20/ha, or 20m apart along linear features. There are no up-to-date best practice guidelines for reptile surveys, but a minimum of seven survey visits under suitable weather conditions is generally considered to be adequate when determining their presence/likely absence, and 15–20 visits are used to calculate a 'peak count' for a more detailed population size class assessment. An appropriate survey effort may depend upon the size of a site and suitability of habitats present and often requires the judgment of a suitably qualified and experienced ecologist.

A total of 13 roofing felt mats were used in this survey (see Figure 3). The mats were left in situ for a minimum of 10 days to 'bed in' and allow reptiles to locate them before the first check. The mats were checked at least seven times over the period between the 4th of July and the 26th of August 2022 and



all observations of reptiles were recorded, together with the weather conditions, temperature and time of day.

The survey refugia were placed around the site, focusing on the areas of long vegetation and scrub where they would warm up in the morning or afternoon sun. The survey sheets were spaced evenly in all suitable reptile habitat around the site, where possible avoiding areas that would be constantly shaded by trees.



Figure 3. Location of reptile refugia (identified with yellow dots). Images produced courtesy of Google maps (map data ©2022 Google).

3.2 Great Crested Newts

3.2.1 Habitat Suitability Assessment

There is one pond immediately adjacent to the northern boundary of land south of Lyne House. The desk study revealed no other waterbodies within 500m of the site boundary. This pond underwent an assessment for the potential to support great crested newts using the Habitat Suitability Index (HIS) (Oldham et al 2000).

Although the pond on the northern boundary was assessed as having 'below average suitability' to support great crested newts. Due to the proximity to the site and associated suitable terrestrial habitat within the site, it was considered necessary to perform eDNA analysis.



3.2.2 Environmental DNA Sampling and Analysis

This relatively new technique allows a quick and reliable qualitative measure of the presence/likely absence of great crested newts. It involves collection of water samples from a pond, using a standard protocol set out by Natural England². The samples are sent to an approved laboratory to isolate and determine presence of environmental DNA (eDNA) shed into the water by amphibians during the breeding season. The eDNA samples were taken on the 24th June 2022.

4 RESULTS

4.1 Reptiles

4.1.1 Presence/likely absence survey

Slow worms were identified throughout the site, but mostly around the south-western corner of the site. A peak of nine adult slow worms was identified on site which is a 'good' population³. A peak of four juveniles was also found indicating a breeding population is present. The survey findings, dates and conditions are presented in Table 1 below.

Table 1. Results of reptile survey undertaken at Lyne House, Worthing (BF= Beaufort scale).

Date	Start time	Air temp. °C	Refugia temp. °C	Weather conditions	Results
04/07/22	08:20	15	22	BF1, 30% cloud cover, sunny, dry	2 adult female slow worms 2 juvenile slow worms
26/07/22	08:15	16	19	BF2, 70% cloud cover, cloudy, dry	3 adult male slow worms 4 adult female slow worms 3 juvenile slow worms
01/08/22	08:00	18	21	BF1, 80% cloud cover, cloudy, dry	3 adult male slow worms 6 adult female slow worms 1 unidentified slow worm
03/08/22	08:00	17	23	BF3, 100% cloud cover, previously sunny, dry	3 adult male slow worms 3 adult female slow worms 4 juvenile slow worms
05/08/22	09:00	16	24	BF3, 0% cloud cover, sunny, dry	1 adult male slow worm 1 adult female slow worm 2 juvenile slow worms
09/08/22	08:15	17	22	BF2, 0% cloud cover, sunny, dry	2 adult female slow worms 1 juvenile slow worm
26/08/22	08:15	14	18	BF2, 30% cloud cover sunny, dry	None

² Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. *Analytical and methodological development for improved surveillance of the Great Crested Newt*. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

³ Froglife (1999). Froglife Advice Sheet 10 Reptile Survey.



4.1.2 Impacts, mitigation and compensation measures

The loss of habitat in the form of scrub and log piles especially, is likely to cause direct harm to slow worms through machinery use as well as removing suitable habitat at the site. As such, mitigation will be required. This will need to be outlined in full within a reptile mitigation strategy document.

To avoid the harm of reptile species during the construction phase, a reptile translocation will be required. Given the lack of suitable habitat to be retained on-site, an off-site receptor site will be required. This receptor site will need to be secured and enhanced for slow worms prior to commencement of the translocation process. At present, a receptor site has not been identified. A search would need to identify a site within the following parameters:

- Preferably adjacent to the site, but within 1km radius maximum
- Same or larger area than the area from which reptiles will be translocated from
- Must already include some habitat suitable for reptiles
- Suitable for carrying slow worm population with some enhancement using hibernacula (see Figure 4)
- Not subject to any threats from site management obligations (i.e. farming) or future development

The landowners of all potential receptor sites will be contacted during the detailed planning stage of works to ensure that the most suitable location is chosen, with a management plan that allows the reptile population to increase over many years.

A reptile presence/absence survey will be undertaken at the potential reptile receptor site deemed most suitable to determine the use of the site by reptiles, the size of any reptile population present and conclude its suitability.

Possible receptor sites could include two golf courses to the east of the site, Cissbury Ring 1.7km north, the woodland edge habitat at Bost Hill 1.5km north, the woodland located on Worthing College's grounds 1km south, or any other sites within a reasonable distance that have the potential to support a 'good' population of slow worms.

Primarily, reptile fencing should be constructed around the application site to prevent the entry of further reptiles. Artificial refugia should then be placed at a minimum density of 100 sheets per hectare around the site. In accordance with current guidelines outlined by the Amphibian and Reptile Group (ARGUK), a total of 60 trapping days will be achieved between mid-March and October, using a mixture of reptile 'mats' or 'tins' (bitumen sheets or corrugated metal sheets) placed at a density of not less than 100 per hectare of suitable habitat in line with ARGUK guidelines. The construction zone will be signed off for works to commence after the 60 trapping days have been achieved.

Once complete, the site will need to be rendered unsuitable for reptiles. This will be undertaken under supervision of a suitably qualified ecologist. A two-phase strim of the site will be undertaken. The first strim will reduce the height of vegetation onsite to no less than 10cm, slowly from south to north so any common toads or other animals can escape. The second strim should be as short as possible and be carried out shortly after. All vegetation should then remain no more than 5cm throughout the works.



Finally, a destructive search of any remaining features with potential to support reptiles. All remaining logs, stumps, rubble piles, debris, rabbit burrows or other feature with suitable refuges will be carefully and methodically removed and destroyed using an excavator with a toothed bucket, with a suitably qualified ecologist on standby to catch and rescue any exposed animals. The fencing should remain in place until after the works are completed.

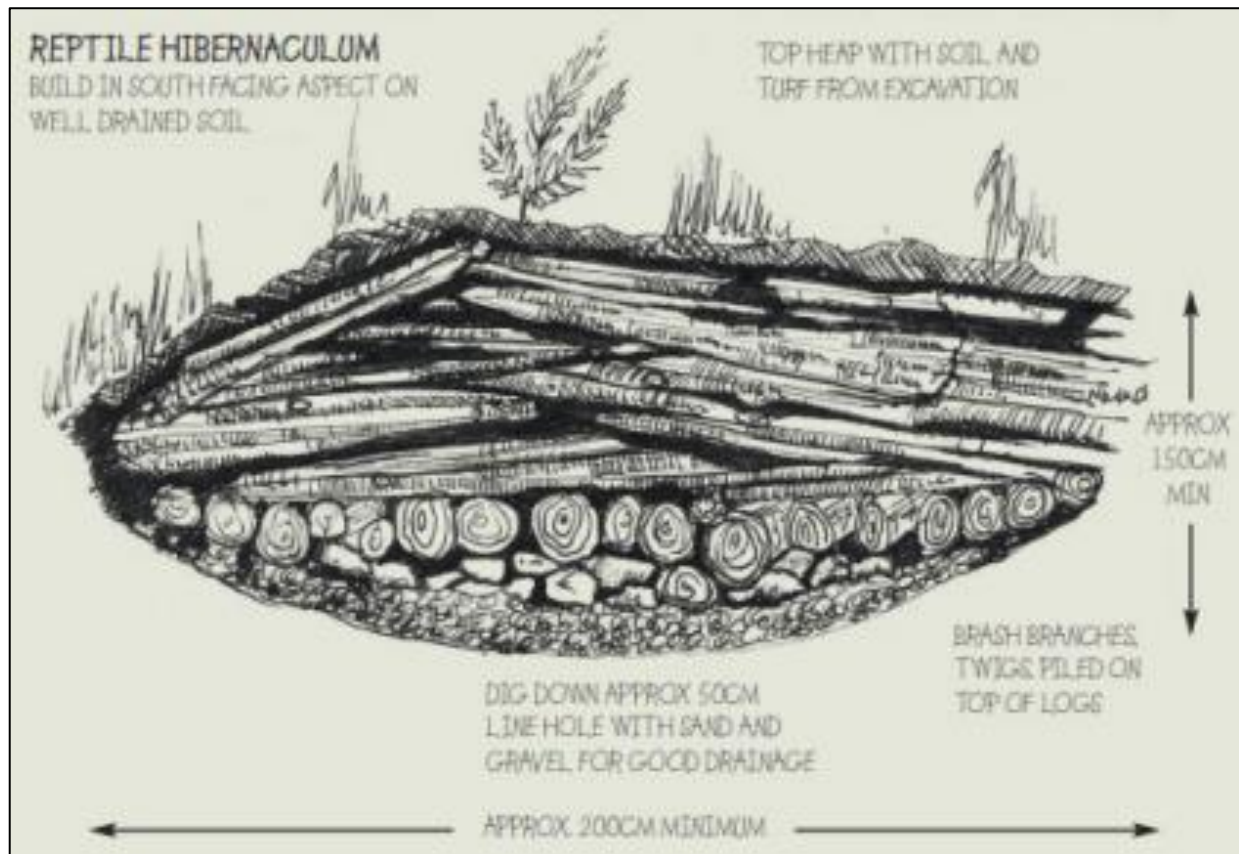


Figure 4. The rough structure of a reptile hibernaculum. Image taken from Managing Habitat for Adders: Advice for Land Managers – May 2018, ARG UK.

4.2 Great Crested Newts

4.2.1 Habitat Suitability and eDNA Testing

The HSI assessment returned a result of 0.52 'below average suitability' for great crested newts, and the eDNA result for the pond directly adjacent to land south of Lyne House was subsequently returned as negative. See Appendix 1 for the full HSI and eDNA results.

4.2.2 Impacts, mitigation, and compensation measures

The result above indicates that the pond adjacent to the site does not support great crested newts and it is highly unlikely they will be found on site at any time. Therefore, no mitigation regarding great crested newts will be necessary.



However, given the suitable terrestrial habitat for amphibians on site, it is possible that the common toad *Bufo bufo*, which is now near threatened, may use the pond and therefore the associated terrestrial habitat on site. As such, clearance of the site and landscaping works as part of the development may cause direct harm to this species. The mitigation measures outlined for reptiles above should protect this species from harm during the construction phase.

Where possible, the site can be enhanced for this species. This could include enhancing retained grassland with wildflowers or the inclusion of log piles.

4.3 Constraints/Limitations to Surveys

Surveys record any fauna that is present at the time of the survey visits. It is therefore possible that some species may not have been present during the survey but may be evident at other times of the year and may appear or disappear from the site if habitat conditions change. For this reason, the surveys are considered valid for up to two years for reptiles. If the habitat conditions change significantly in the intervening period, then it is recommended that the surveys be updated.

Due to the tall, mature beech trees on the western boundary, much of the site was shaded in the afternoon and evening. For this reason, afternoon reptile surveys were not carried out as most of the site would be in sub-optimal conditions during this time. As reptile presence was confirmed throughout the site and weather conditions were optimal, this was not considered a significant limitation.

5 CONCLUSIONS

Slow worms were identified across the site but were mostly found around the south-western corner. A peak count of nine slow worms was recorded indicating a 'good' population. Direct harm may be caused to this species throughout the construction works as well as a loss of suitable habitat on site.

Therefore, prior to any work commencing the site will need to be fenced off, using reptile fencing to ensure no further reptiles can enter. The slow worms present will then be translocated from the site to a suitable receptor site.

A sample of water was taken from the pond adjacent to the northern boundary, and analysed for great crested newt eDNA. The sample was returned negative meaning the pond does not support great crested newts. Therefore, this species is highly unlikely to be found on site at any time and no further mitigation regarding great crested newts will be necessary. However, the mitigation outlined for reptiles will also protect common toad, which may be present on the site.

Should you need any further advice on the information provided above, please do not hesitate to contact The Ecology Co-op.



APPENDIX 1 – HSI and eDNA Results

Table 2. Raw HSI data.

	Pond 1	
NGR	TQ 13394 06030	
SI attribute	SI value	Notes
Location	1.00	SE England
Pond area	0.04	20sq/m
Pond drying	1.00	Rarely
Water quality	0.67	Moderate
Shade cover	0.80	70
Water-fowl	1.00	Absent
Fish presence	1.00	Absent
No. ponds	0.10	0
Terrestrial habitat	0.67	Moderate
Macrophytes	1.00	80%
HSI value	0.52	'Below Average' suitability



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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: 27/06/2022
Date Reported: 06/07/2022
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
1912	BOUNARY POND	TQ 13396 06031	Pass	Pass	Pass	Negative	0

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

Reported by: Chris Troth

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