



Botley West Solar Farm

Environmental Statement

Volume 3

Appendix 9.7: Reptile Survey Report

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Contents

1	INTRODUCTION	4
1.1	Overview	4
1.2	Legislation	4
2	METHODOLOGY	5
2.1	Desk Study	5
2.2	Reptile Field Surveys	5
3	RESULTS	7
3.1	Desk Study	7
3.2	Reptile presence / absence surveys	7
3.3	Reptile population size assessment.....	8
4	SUMMARY	9
4.2	References	10

Tables

Table 2.2.1	Population Size Assessment Index.....	6
Table 3.1.1.	Reptile records within 2 km of the Project site.....	7
Table 3.2.1.	Summary of 2022 and 2023 reptile presence absence survey results.....	7

Annexes

- Annex A Reptile Survey Areas
- Annex B Reptile Refuges and Survey Results Maps
- Annex C Reptile Survey Results Tables

Glossary

Term	Meaning
The Applicant	SolarFive Ltd (SolarFive)
The Project	Botley West Solar Farm
The Developer: Photovolt Development Partners Gmbh	Photovolt Development Partners GmbH (PVDP).
Priority Species	Species listed as being of principal importance for conservation under Section 41 of the Natural Environment and Rural communities Act 2006.

Abbreviations

Abbreviation	Meaning
ES	Environmental Statement
European Protected Species	Species listed on Schedule 2 of the conservation of Habitats and Species Regulations 2017 (as amended)
NERC	Natural Environment and rural Communities
PVDP	Photovolt Development Partners GmbH
S41	Section 41 of the of the Natural Environment and rural Communities (NERC) Act 2006
TVERC	Thames Valley Environmental Records Centre
WCA5	Wildlife and Countryside Act 1981 (as amended), Schedule 5

Units

Unit	Description
cm	Centimetres
ha	Hectares
km	Kilometres
mph	Miles per hour

1 Introduction

1.1 Overview

1.1.1 This Appendix of the Environmental Statement (ES) has been prepared by RPS on behalf of Photovolt Development Partners GmbH. (PVDP) for the Applicant, SolarFive Ltd. (SolarFive).

1.1.2 The purpose of this technical report is to present the methodology and results of the reptile surveys for the Project. The results of this report have been used to inform Chapter 9: Ecology and Nature Conservation in Volume 1 of the ES [EN010147/APP/6.3].

1.2 Legislation

1.2.1 All native UK reptile species: smooth snake *Coronella austriaca*, sand lizard *Lacerta agilis*, adder *Vipera berus*, grass snake *Natrix helvetica*, common lizard *Zootoca vivipara* and slow worm *Anguis fragilis*) are partially protected through Section 9(1 and 5) of the Wildlife & Countryside Act 1981 (as amended). This prohibits:

- Intentional or reckless injuring or killing;
- Selling, offering or exposing for sale, or having in possession or transporting for the purpose of sale, any live or dead wild animal or any part of, or anything derived from, such an animal; or
- Publishing or causing to be published any advertisement likely to be understood as conveying buying or selling, or intending to buy or sell, any of those things.

1.2.2 All six native species are also listed under Section 41 of the Natural Environment and rural Communities (NERC) Act 2006 as species of principal importance for nature conservation in England (Priority Species).

1.2.3 Two species of reptiles (sand lizard and smooth snake) are also listed on Schedule 2 of the conservation of Habitats and Species Regulations 2017 (as amended) and are referred to as European Protected Species. Of relevance to development, under Part 3, Section 43 of the regulations it is an offence to:

- Deliberately capture, injure or kill any wild animal of a European Protected Species;
- Deliberately disturbs wild animals of any such species;
- Deliberately take or destroy the eggs of such an animal; or
- Damage or destroy a breeding site or resting place of such an animal.

1.2.4 Disturbance includes in particular any disturbance which is likely:

- To impair their ability;
- To survive, to breed or reproduce, or to rear or nurture their young;
- In the case of animals of a hibernating or migratory species, to hibernate or migrate; or

- To affect significantly the local distribution or abundance of the species to which they belong.

2 Methodology

2.1 Desk Study

2.1.1 Records of reptiles from the last 10 years within 2 km of the Project site were requested from the Thames Valley Environmental Records Centre (TVERC) as part of the Ecology and Nature conservation Desk Study. The full results of the desk study are presented in Chapter 9 Appendix 9.1: Desk Study of the ES [EN010147/APP/6.5]. The results pertaining only to reptiles are also summarised in this report.

2.2 Reptile Field Surveys

Reptile Scoping

2.2.1 A walkover survey of the Project site was undertaken in March 2022 to identify habitats with the potential to support reptiles. For convenience, the Project site was divided into 11 survey areas. Reptile presence / absences surveys were targeted at suitable habitats within these areas. The survey areas are show in Annex A.

Artificial Refuge Surveys

2.2.2 The reptile survey followed the recommended methodology described in the Herpetofauna Worker's Manual (Gent & Gibson, 2003) and Froglife's Surveying for Reptiles (Froglife, 2016).

2.2.3 The surveys were carried out over multiple survey seasons to cover the site, with the site divided into different areas as show on Annex A. The Areas were surveyed as follows:

- Areas 10 to 12 (North of Cassington) and Denman's Farm (Area 9) surveyed in September and October 2022; and
- Areas 1 to 8 surveyed in April to September 2023.

2.2.4 The reptile survey was conducted using artificial refuges made from roofing felt measuring 50 cm x 50 cm and 50 cm x 100 cm. The refuges provide shelter and basking opportunities for reptiles, which can be identified on or under the refuges in suitable weather conditions. The location of refuges during the surveys is presented in Annex B.

2.2.5 A total of 258 refuges were used in the 2022 survey deployed as follows:

- Areas 10 to 12: 133 refuges; and
- Denman's Farm: 125 refuges.

2.2.6 A total of 353 refuges were deployed across all survey areas in 2023, as follows:

- Areas 1 and 2: 87 refuges;

- Areas 3 and 4: 64 refuges;
- Area 5 and 6: 58 refuges; and
- Areas 7 and 8: 144 refuges.

2.2.7 The location of the artificial reptile refuges were recorded using Global Positioning System. The refuges were placed out at least two weeks before the start of the survey to allow vegetation dieback beneath the refuges and to allow reptiles to find and start to use them.

2.2.8 The refuges were placed in areas identified as providing the greatest suitability for reptiles and which had optimal basking opportunities. Areas of high disturbance, including areas with high livestock use were generally avoided, where practicable.

2.2.9 In order to conform to best practice guidelines, the refuges were inspected on seven survey visits on different days between April and September.

2.2.10 Each refuge was checked by the surveyor between 7am and 6pm when the air temperature was between 10°C to 20°C, there was little or moderate wind (equivalent to the Beaufort scale 4; 13 to 17 mph) and when it was dry. Weather conditions during each survey visits are reported in Annex C.

2.2.11 Surveys between periods of heavy rain, when all other conditions were suitable, were considered acceptable as reptiles are known to be active between rain showers if conditions are sufficiently warm and not too wet, e.g. flooded.

2.2.12 During each survey the artificial reptile refuges were checked first from a distance to avoid disturbing any reptiles that may have been warming themselves on the refuges. Each refuge was then carefully lifted to check for reptiles sheltering beneath.

2.2.13 All reptiles observed were recorded including species, the number of individuals, their life stage (adult, subadult, juvenile), the sex (where possible), the survey area, and artificial refuge number / location.

Population Size Class Assessment.

2.2.14 An estimate of the population size for all reptile present was made with reference to guidance published by Froglife (1999). The guidance gives a basic index of relative abundance of reptiles based on the maximum number of different adults seen whether in the open or on or under refuges by one person in one day with a refuges density of 10/ hectare (ha) (see Table 2.2.1).

Table 2.2.1 Population Size Assessment Index.

Species	Low Population	Good Population	Exceptional Population
Adder	<5	5-10	>10
Grass Snake	<5	5-10	>10
Common Lizard	<5	5-20	>20
Slow Worm	<5	5-20	>20

Limitations

2.2.15 The number of refuges used in the survey of Areas 5-6 was below the 10/ha density recommendation due to the nature of the habitat in these areas (narrow field margins). However, the survey still identified the presence of reptiles in these areas and the thresholds in Table 2.2.1 have been adjusted accordingly. As such, it is considered that the assessment of the reptile populations in these areas is still valid.

3 Results

3.1 Desk Study

3.1.1 The desk study identified 139 records of reptiles from the last 10 years within 2 km of the Project site. The records are summarised in Table 3.1.1 below and record locations are presented in Appendix 9:1 Desk Study [EN010147/APP/6.5].

Table 3.1.1. Reptile records within 2 km of the Project site.

Common name	Scientific name	No. of records	Nearest distance from the Project (km)	Year of most recent record	Conservation status
Slow-worm	<i>Anguis fragilis</i>	82	0 (6 records)	2023	S41, WCA5
Common Lizard	<i>Zootoca vivipara</i>	16	0.11	2021	S41, WCA5
Grass Snake	<i>Natrix helvetica</i>	40	0.17	2021	S41, WCA5
Adder	<i>Vipera berus</i>	1	0.34	2015	S41, WCA5

3.2 Reptile presence / absence surveys

3.2.1 The individual table of results for each of the survey areas along with weather conditions during the surveys are provided in Annex C.

3.2.2 A summary of the results is provided in Table 3.2.1 which gives the species found and the peak count on any one survey visit. Where the table states a breeding population this indicates that juveniles were found during the survey although juveniles do not count towards the peak count.

3.2.3 The results are also shown graphically in Annex C.

Table 3.2.1. Summary of 2022 and 2023 reptile presence absence survey results.

Survey Area	Year Surveyed	No of survey visits	Peak Counts		
			Slow worm	Grass Snake	Common Lizard
Areas 10 to 12	2022	7	None	None	None

Denmans Farm	2022	7	None	None	None
1 and 2	2023	7	None	None	None
3 and 4	2023	7	None	None	None
5 and 6	2023	7	3 (breeding population)	None	None
7 and 8	2023	7	6 (breeding population)	1 (breeding population)	1

3.3 Reptile population size assessment

- 3.3.1 The reptile populations size class assessment is at best an approximation. The survey areas are not physically separate from suitable reptile habitat outside of the survey area so are unlikely to represent discreet populations.
- 3.3.2 The population size class assessment therefore should be seen as providing the relative importance of the survey areas for reptiles within the wider site.
- 3.3.3 For the purpose of counting refuge density, the area used was the area of suitable habitat including field margins, woodland, grassland and tall herb vegetation. Arable fields, and bare ground and short grazed pasture were excluded as these habitats have negligible potential to support reptile.

Areas 5-6

- 3.3.4 The total area of suitable habitat surveyed in Areas 5-6 is approximately 7 ha, with 58 refuges giving a refuge density of 8.14 refuges / ha. On this basis, the population indexes in Table 2.2.1 are multiplied by 0.814 to adjust for the refuge density used.
- 3.3.5 For slow worm, this gives a threshold for a low population of <4.08 and a threshold for an exceptional population of >16.3.
- 3.3.6 Therefore, the peak count of slow-worm in Areas 5-6 was three which equates to a 'low' population.

Areas 7-8

- 3.3.7 The total area of habitat surveyed in Areas 7-8 site was approximately 8.34 ha with 144 refuges used giving a refuge density of 17.27 /ha. On this basis, the population indexes in Table 2.2.1 are multiplied by 1.727 to adjust for the refuge density used.
- 3.3.8 For slow worm and common lizard this gives a threshold for a low population of <8.64 and a threshold for an exceptional population of >34.54. For grass snake the threshold for a low population is <8.64, while the threshold for an exceptional population is >17.27
- 3.3.9 Therefore, the peak counts of slow-worm (4), common lizard (1) and grass snake (1) found in Areas 7-8 equates to 'low' populations of all three species.

4 Summary

- 4.1.1 The desk study identified 139 records of slow worm within 2 km of the Project site from the last 10 years. The records included four reptile species: slow worm, common lizard, grass snake and adder. Of these four species only one (slow worm) had been recorded within the Project site, with six records.
- 4.1.2 Reptile presence / absence surveys were undertaken across the site over 2022 and 2023. For convenience the site was divided into surveys areas forming distinct contiguous. Areas 10 to 12 and Denmans were surveyed in 2022. Areas 1 to 8 were surveyed in 2023.
- 4.1.3 No reptiles were recorded in Areas 1 to 4, 10 to 12 or Denmans.
- 4.1.4 One reptile species (slow worm) was recorded in Areas 5-6 with a 'low' population (peak count of three on any one visit).
- 4.1.5 Three reptile species were recorded in Areas 7-8: slow worm, common lizard and grass snake. All three species had 'low' populations with peak counts of four, one and one respectively.

4.2 References

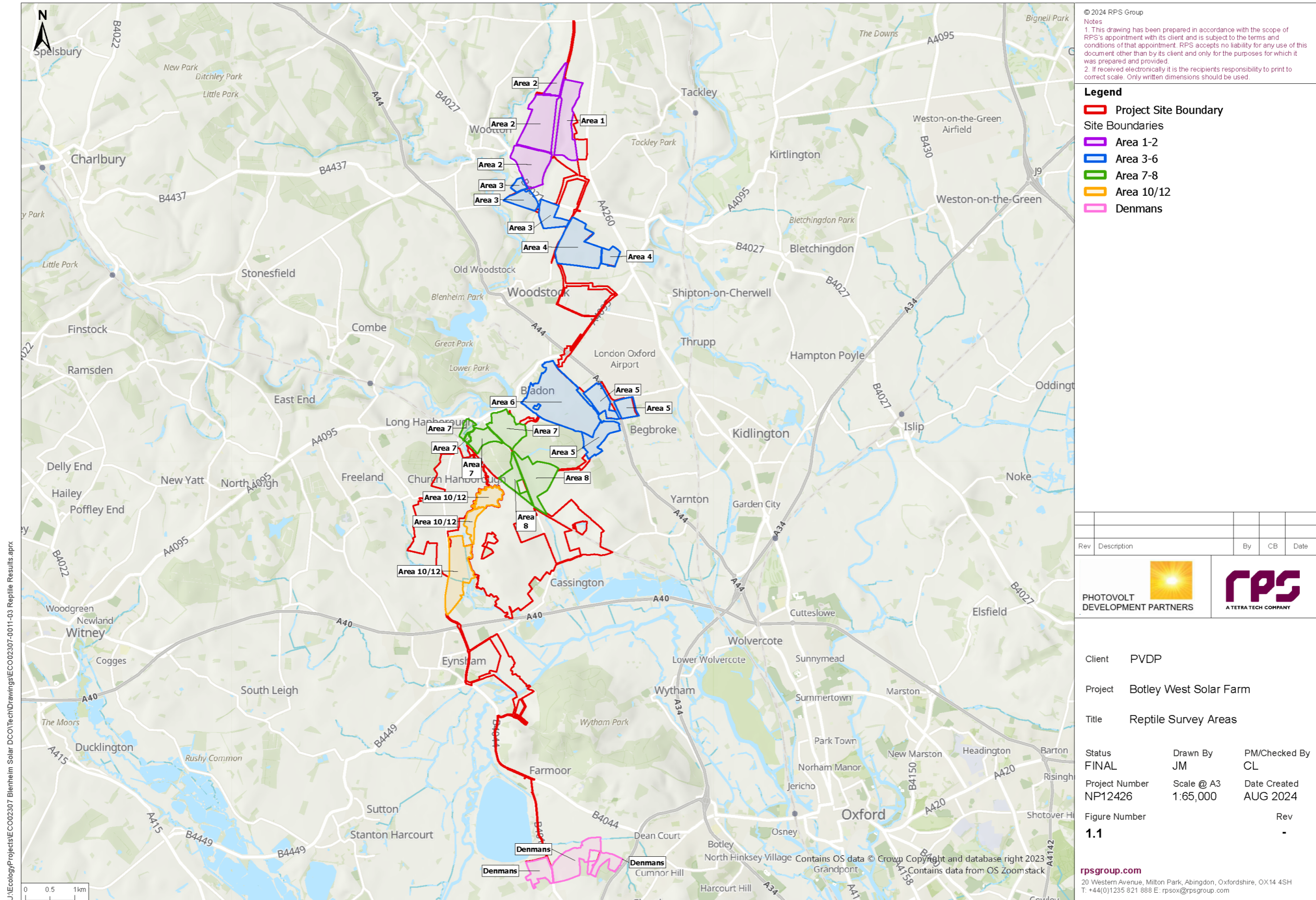
Froglife (1999) *Froglife Advice Sheet 10 - Reptile Survey An introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife, Peterborough.

Gent & Gibson. (2003). *Herpetofauna Worker's Manual*. JNCC, Peterborough.

Annex A

Reptile Survey Areas

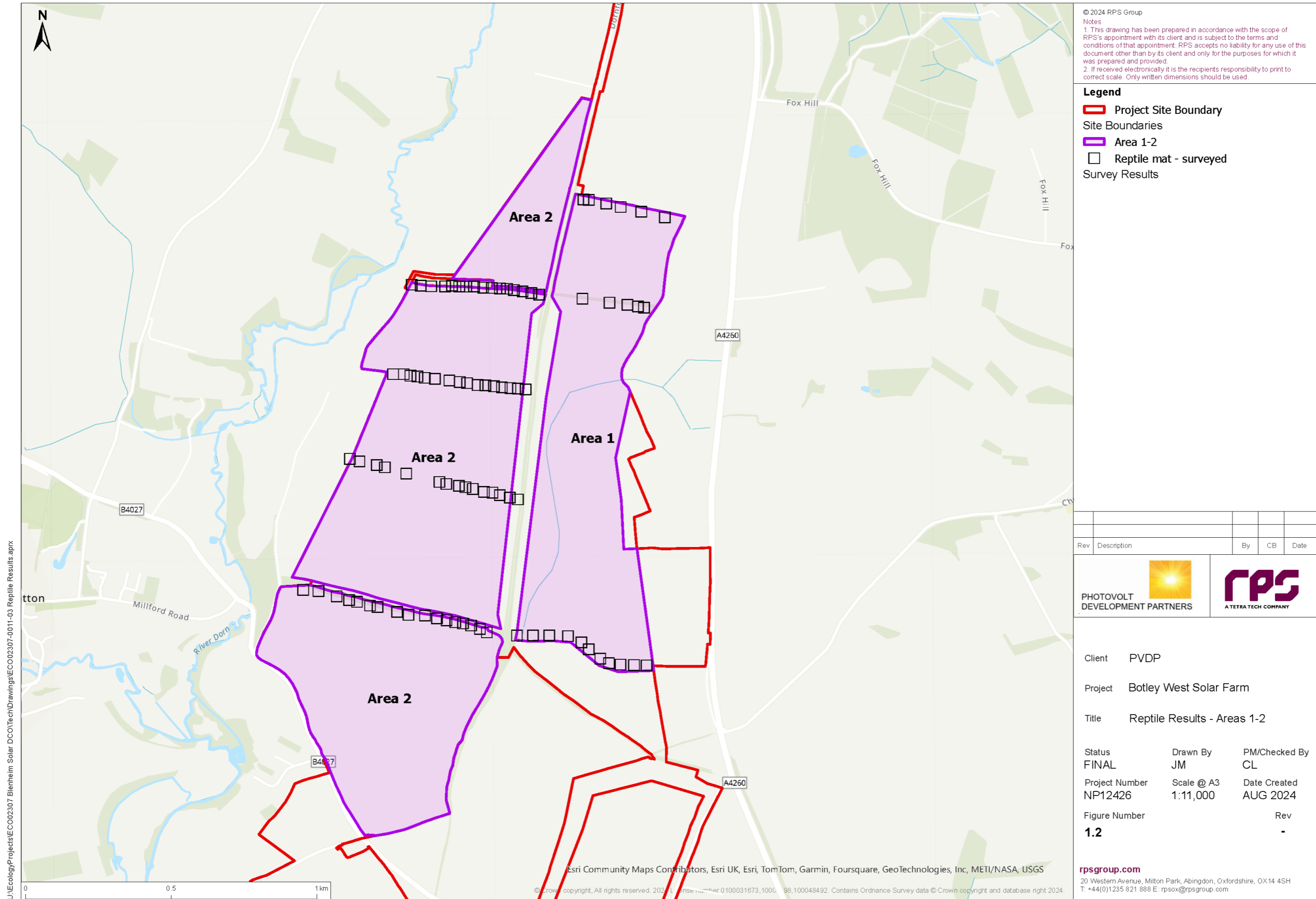
Anx Figure 1 Reptile survey areas.



Annex B

Reptile Refuges and Survey Results Maps

Anx Figure 2 Reptile survey results: Areas 1-2



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- Legend**
- Project Site Boundary
 - Site Boundaries
 - Area 1-2
 - Reptile mat - surveyed
 - Survey Results

Rev	Description	By	CB	Date

Client PVDP
Project Botley West Solar Farm
Title Reptile Results - Areas 1-2

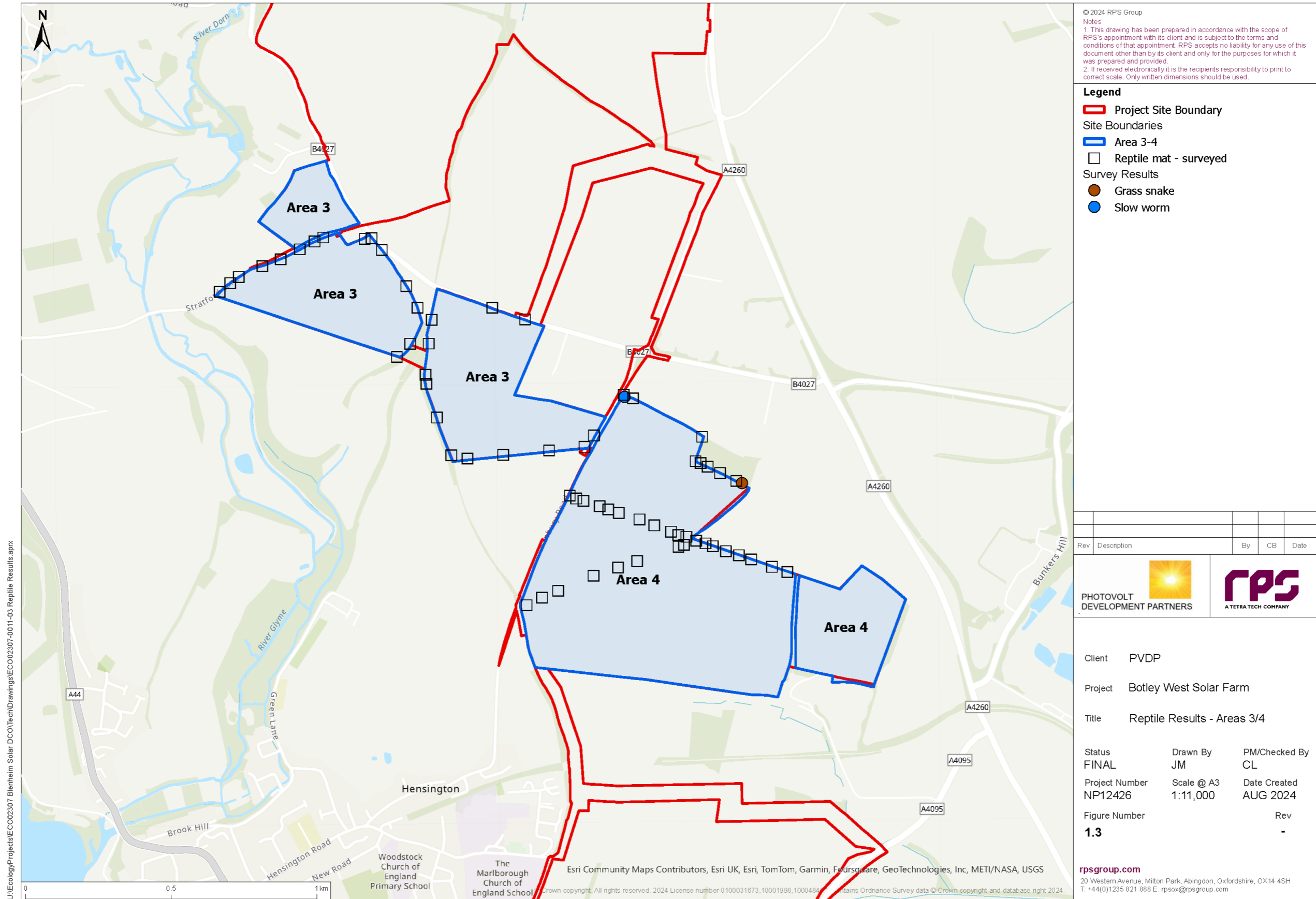
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FINAL	JM	CL
Project Number	Scale @ A3	Date Created
NP12426	1:11,000	AUG 2024
Figure Number		Rev
1.2		-

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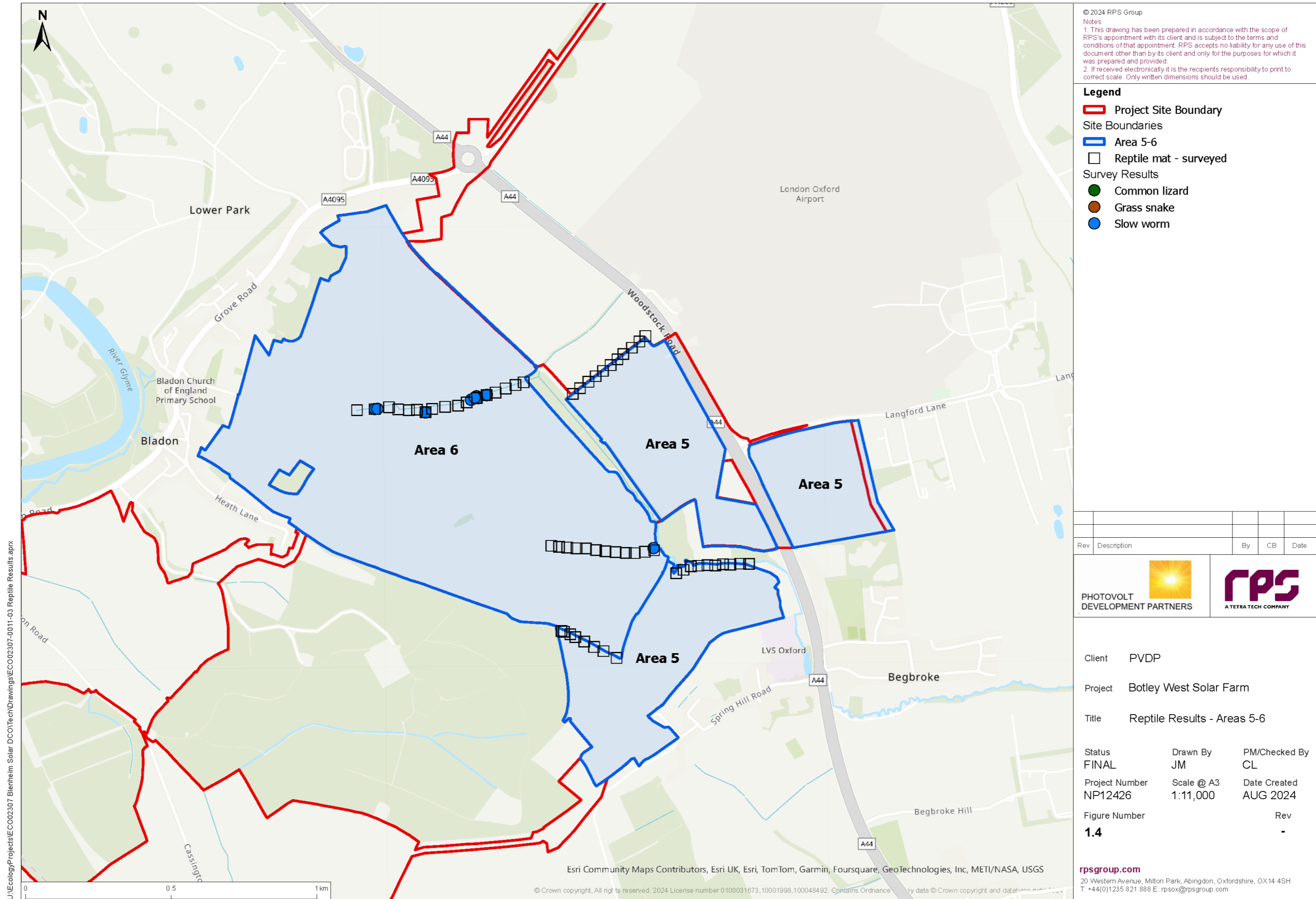
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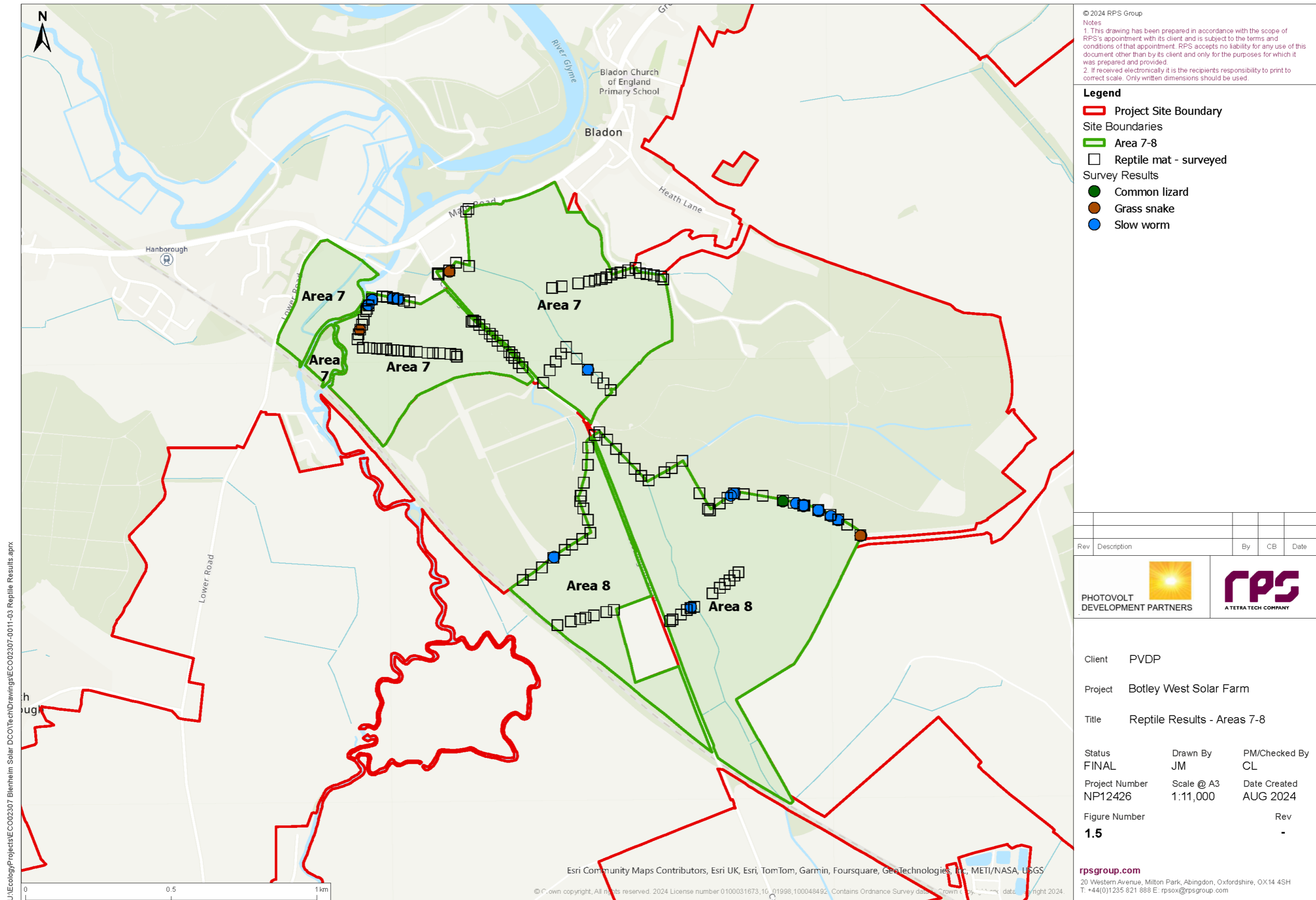
Anx Figure 3 Reptile survey results: Areas 3-4.



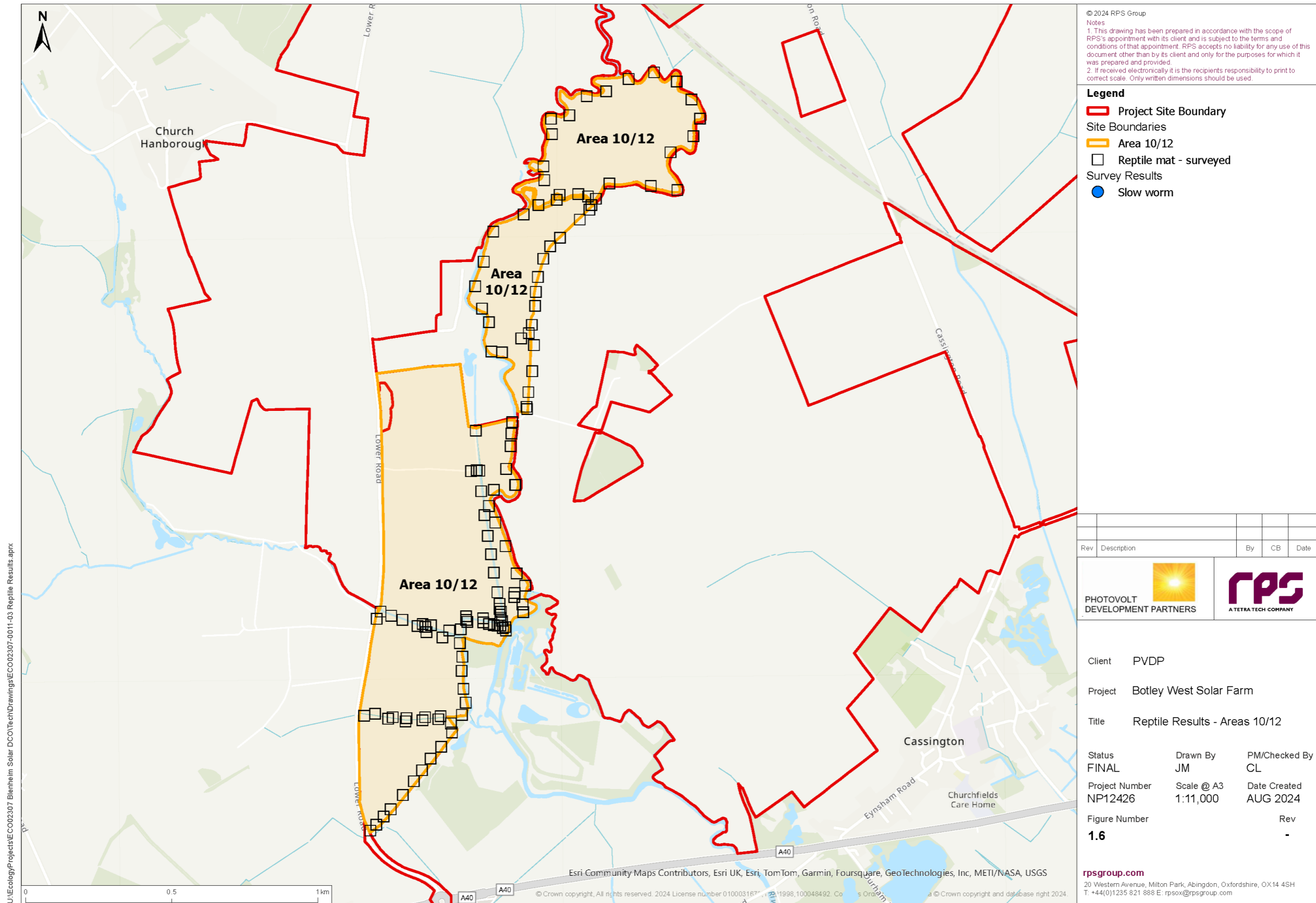
Anx Figure 4 Reptile survey results: Areas 5-6.



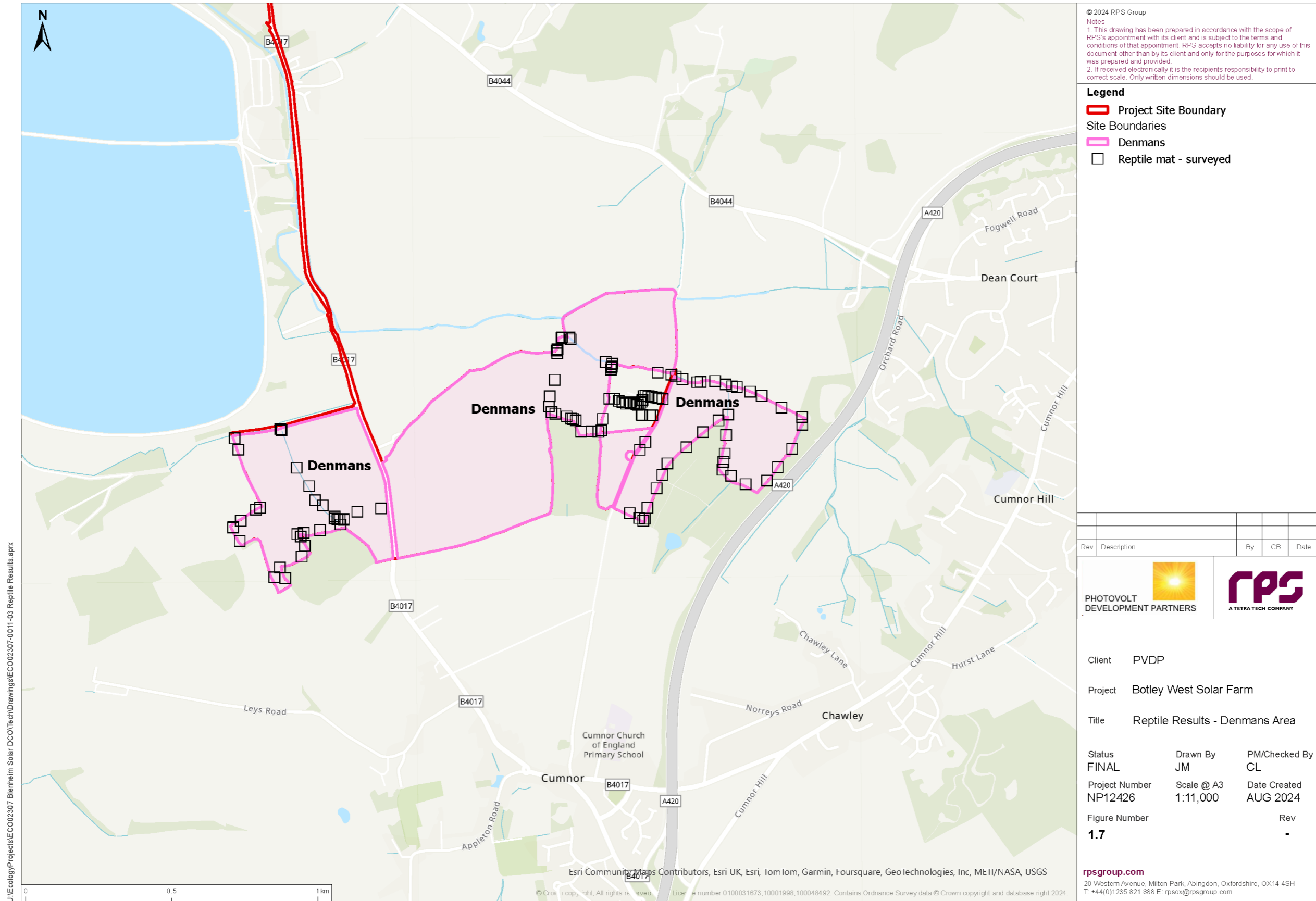
Anx Figure 5 Reptile survey results: Areas 7-8.



Anx Figure 6 Reptile survey results: Areas 10-12.



Anx Figure 7 Reptile survey results: Denmans.



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- Legend**
- Project Site Boundary
 - Site Boundaries
 - Denmans
 - Reptile mat - surveyed

Rev	Description	By	CB	Date

Client PVDP
Project Botley West Solar Farm
Title Reptile Results - Denmans Area

Status	FINAL	Drawn By	JM	PM/Checked By	CL
Project Number	NP12426	Scale @ A3	1:11,000	Date Created	AUG 2024
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Annex C

Reptile Survey Results Tables

Anx Table 1 2022 Reptile survey results for Denmans Farm.

Visit Number	Survey Date	Weather	Reptile Species Recorded
1	22/09/22	18°C, cloud 0/8, BF 0, dry	None
2	26/09/22	14°C, cloud 3/8, BF 1, dry	None
3	30/09/22	12°C, cloud 3/8, BF 2, dry	None
4	03/10/22	15°C, cloud 2/8, BF 2, dry	None
5	10/10/22	13°C, cloud 0/8, BF 2, dry	None
6	17/10/22	17°C, cloud 3/8, BF 2, dry	None
7	24/10/22	16°C, cloud 3/8, BF 4, dry	None

Anx Table 2 2022 Reptile survey results for Areas 10 to 12.

Visit Number	Survey Date	Weather	Reptile Species Recorded
1	22/09/22	18°C, cloud 0/8, BF 0, dry	None
2	26/09/22	14°C, cloud 3/8, BF 1, dry	None
3	30/09/22	12°C, cloud 3/8, BF 2, dry	None
4	03/10/22	15°C, cloud 2/8, BF 2, dry	None
5	10/10/22	13°C, cloud 0/8, BF 2, dry	None
6	17/10/22	17°C, cloud 3/8, BF 2, dry	None
7	24/10/22	16°C, cloud 3/8, BF 4, dry	None

Anx Table 3 2023 Reptile survey results of Areas 1 and 2.

Visit Number	Survey Date	Weather	Reptile Species Recorded
1	11/04/2023	4/8 breeze, 4/8 cloud, 12°C	None
2	25/04/2023	2/8 breeze, 1/8 cloud, 11°C	None
3	15/05/2023	4/8 breeze, Partly sunny, 12°C	None
4	17/08/2023	4/8 breeze, Sunny, 18°C	None
5	25/08/2023	2/8 breeze, sunny, 2/8 cloud, 14°C	None
6	13/09/2023	3/8 breeze, 4/8 cloud, 13°C	None

7 21/09/2023 3/8 breeze, sunny, 14 °C None

Anx Table 4 2023 Reptile survey results of Areas 3 and 4.

Visit Number	Survey Date	Weather	Reptile Species Recorded
1	13/04/2023	4/8 breeze, 12°C	None
2	25/04/2023	1/8 breeze, 11°C	None
3	22/05/2023	3/8 breeze, 12°C	None
4	9/08/2023	1/8 breeze, 17°C	None
5	17/08/2023	3/8 breeze, 19°C	None
6	11/09/2023	Breeze 1/8, Cloud 2/8, 18°C	None
7	14/09/2023	2/8 breeze, sunny, 15°C	None

Anx Table 5 2023 Reptile survey results of Area 5 and 6.

Visit Number	Survey Date	Weather	Reptile Species Recorded
1	13/04/2023	4/8 breeze, sunny, 10°C	1 adult slow-worm (sex-undetermined)
2	26/04/2023	3/8 breeze, partly sunny, 10°C	3 adult slow-worm (1 male, 2 undetermined)
3	22/05/2023	3/8 breeze, partly sunny, 12°C	1 adult slow-worm and 4 juvenile slow-worm (sex-undetermined)
4	9/08/2023	0/8 breeze, partly sunny, 15°C	1 adult male slow-worm
5	17/08/2023	4/8 breeze, partly sunny, 19°C	None
6	11/09/2023	2/8 breeze, partly sunny, 19°C	None
7	14/09/2023	2/8 breeze, partly sunny, 15°C	None

Anx Table 6 2023 Reptile survey results of Areas 7 and 8.

Visit Number	Survey Date	Weather	Reptile Species Recorded
1	20/04/2023	3/8 breeze, sunny, 11°C	None
2	28/04/2023	3/8 breeze, partly sunny, 15°C	1 female juvenile slow-worm 1 adult male slow-worm
3	19/05/2023	0/8 breeze, 4/8 cloud, 15°C	2 juvenile slow-worms (sex-undetermined), 2 adult female slow-worm, 2 adult male slow-worm, 1 sub-adult slow-worm (sex-undetermined), 2 juvenile grass-snake

Visit Number	Survey Date	Weather	Reptile Species Recorded
			1 subadult grass-snake (sex-undetermined)
4	19/06/2023	0/8 breeze, 8/8 cloud, 19°C	3 adult female slow-worm, 2 female sub-adult slow-worm, 1 adult male slow-worm, 1 juvenile grass-snake sex undetermined, 1 adult common lizard (sex-undetermined)
5	09/08/2023	1/8 breeze, scattered clouds, 17°C	3 adult female slow-worm
6	13/09/2023	3/8 breeze, scattered clouds, 14°C	1 adult male slow-worm
7	15/09/2023	1/8 breeze, passing clouds, 12°C	None
	26/09/2023	3/8 breeze, 3/8 cloud, 18°C	