



UNIVERSAL DESTINATIONS & EXPERIENCES UK PROJECT

Former Kempston Hardwick Brickworks
and adjoining land, Bedford

Environmental Statement Volume 3

Appendix 6.12 - Reptile Survey Report

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.1.1. This appendix, the Reptile Survey Report, has been prepared in support of the planning proposal for the construction and operation of an entertainment resort complex and associated development (hereafter referred to as the 'Proposed Development'). The Proposed Development is described in **Chapter 2: Description of the Proposed Development (Volume 1)** of the Environmental Statement (ES).
- 1.1.2. The land within the area of the Proposed Development, comprising of 268ha is shown in **Figure 1: Site Location and Survey Areas of Annex 1: Figures**, and will hereafter be referred to as 'the Site', and is split into four zones: Lake Zone, Core Zone, East Gateway Zone and West Gateway Zone.
- 1.1.3. Previous surveys undertaken by Delta-Simons in July-September 2018 (Delta-Simons, 2018¹) found two grass snakes *Natrix helvetica* (one adult and one juvenile) and one adult common lizard *Zootoca vivipara* to be present within the southwest of the Lake Zone within the Site. Both were found in short ephemeral vegetation adjacent to the Marston Vale Railway line. They determined that a small breeding population of grass snake and a small population of common lizard were present within the Site.

1.2 SCOPE OF THE REPORT

- 1.2.1. WSP UK Ltd. was commissioned to undertake reptile surveys of the Site in September-October 2024. The purpose of the surveys and report was to ascertain whether common species of reptile (grass snake, adder *Viper berus*, common lizard and slow worm *Anguis fragilis*) are present/likely absent and their likely population size class within the Site. The surveys and report will also inform the approach to reptile mitigation beyond the submission of the ES.
- 1.2.2. WSP has provided this report solely for the use of the recipient and accepts no liability to any third parties or any other party using or reviewing the report or any part thereof. WSP makes no warranties or guarantees, actual or implied, in relation to this report, or the ultimate commercial, technical, economic, or financial effect on the project to which it relates, and bears no responsibility or liability related to its use other than as set out within the scope of the contract under which it was supplied.

1.3 RELEVANT LEGISLATION AND POLICY

- 1.3.1. All species of reptile in the UK are protected from killing or injuring under the *Wildlife and Countryside Act 1981*² (as amended). The Proposed Development has the potential to impact reptiles through killing/injury, habitat loss, pollution and disturbance, hence the requirement for survey to ascertain presence/likely absence and the requirement for mitigation. All native reptiles are

¹ Delta-Simons (2018) Ecological Appraisal, Bedfordshire Business Park, Kempston.

² HM Government (1981) *Wildlife and Countryside Act 1981*. Available at: <https://www.legislation.gov.uk/ukpga/1981/69> [Accessed: 25 March 2025].

also listed as species of principle importance (SPI) in accordance with Section 41 of the *Natural Environment and Rural Communities (NERC) Act 2006*³ (as amended).

³ HM Government (2006) *Natural Environment and Rural Communities Act 2006*. Available at: <https://www.legislation.gov.uk/ukpga/2006/16/contents> [Accessed: 25 March 2025].

2 METHODS

2.1 Overview

- 2.1.1. This report has been prepared with reference to guidance comprising the following documents:
- *Guidelines for Ecological Report Writing* (Chartered Institute of Ecology and Environmental Management (CIEEM), 2017)⁴;
 - *Herpetofauna Worker's Manual* (Gent and Gibson (Joint Nature Conservation Committee (JNCC)), 2003)⁵; and
 - *Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation* (Froglife, 1999)⁶.
- 2.1.2. This report is based on an ecological desk study (carried out as part of the WSP Preliminary Ecological Appraisal (PEA) (see **Appendix 6.1: Preliminary Ecological Appraisal Report (Volume 3)**) which contains further details) and reptile field surveys carried out in September-October 2024.

2.2 REPTILE SURVEY

- 2.2.1. The survey comprised seven full survey visits (each visit over two days to cover the full Site), each incorporating two elements:
- Survey of deployed artificial refugia; and
 - Visual observation of habitats and natural refugia present by conducting walked transects within and between reptile survey areas.
- 2.2.2. 596 refugia⁷ were installed within suitable habitat for reptiles present on the Site on the 19 to 23 August 2024 and allowed to bed down for two weeks prior to the beginning of the survey visits.
- 2.2.3. A variety of materials sized approximately 0.5m x 0.5m or 0.5m x 1m were used as artificial refugia, this included bitumen felt, and corrugated bitumen. Refugia was sited in suitable basking spots, close to cover, within habitat parcels identified to provide suitable conditions for reptiles during an initial Site walkover.
- 2.2.4. For the purposes of reporting, the Site is divided into four 'Zones', within which are 16 'survey areas' where artificial refugia are grouped according to areas of higher reptile habitat suitability (**Figure 1: Site Location and Survey Areas of Annex 1: Figures**). No refugia were deployed in the East

⁴ Chartered Institute for Ecology and Environmental Management (2017) *Guidelines for Ecological Report Writing, Second Edition*. Available at: <https://cieem.net/wp-content/uploads/2019/02/Ecological-Report-Writing-Dec2017.pdf> [Accessed: 25 March 2025].

⁵ Gent, T. and Gibson, S. (2003) *Herpetofauna Workers' Manual (revised reprint)*. Peterborough, England: Joint Nature Conservation Committee.

⁶ Froglife (1999) *Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation, Froglife Advice sheet 10*. Available at: https://www.wildcare.co.uk/media/wysiwyg/pdfs/froglife_advice_sheet_10_-_reptile_surveys.pdf (Accessed: 25 March 2025).

⁷ Artificial refugia are used to assist with the detection of reptiles within suitable habitat. The materials warm up and retain heat and therefore are attractive to basking reptiles. The settling in period allows favourable conditions i.e. suitable humidity and temperature gradient to develop and for reptiles present within the habitat to become aware of the refugia.

Gateway Zone as habitat here was deemed sub-optimal for reptiles being dense scrub/woodland habitats i.e. with significant barriers to dispersal due to roads, railway and historic land use.

- 2.2.5. Almost 600 refugia were deployed across the 16 reptile survey areas (a total area of approximately 50 hectares), thus exceeding the minimum density as recommended by good practice guidance⁶. This guidance states the number of refugia used “*will depend on many factors, such as likelihood of disturbance, size of site and what the survey is attempting to achieve*” and recommends a minimum of 5-10 refugia per hectare for ‘*general survey purposes*’.
- 2.2.6. The location of each artificial refugia within each survey area was recorded and is shown on **Figure 2: Reptile Survey Results of Annex 1: Figures**.
- 2.2.7. Reptiles are ectothermic animals, deriving their body heat from the external environment. Therefore, the timing of the survey visits was dictated by weather conditions. All surveys were completed within the appropriate season (March to October) and within the appropriate ambient air temperature range (10-18°C). As far as possible, surveys were undertaken on sunny days with low cloud cover and little wind to maximise the probability of recording reptiles, should they be present; where ambient air temperatures were towards the upper end of the temperature range, days of higher cloud cover were targeted. The dates of the surveys and weather conditions are presented in **Table 2-1**.

Table 2-1 – Dates of the Reptile Surveys and Weather Conditions

Visit Number	Dates	Weather Conditions
1	4 September 2024 5 September 2024	16-17°C, wind 13-14km/h, 71-72% humidity, cloud cover 7, no rain. 16-18°C, wind 18-26km/h, 90-95% humidity, cloud cover 7-8, intermittent light showers.
2	12 September 2024 13 September 2024	9-12°C, wind 16-18km/h, 70-81% humidity, cloud cover 2-3, no rain. 7-11°C, wind 6km/h, 75-87% humidity, cloud cover 0-1, no rain.
3	18 September 2024 19 September 2024	16-18°C, wind 16-18km/h, 75-81% humidity, cloud cover 8, no rain. 17-19°C, wind 15-24km/h, cloud cover 7-8, no rain.
4	2 October 2024 3 October 2024	13 °C, wind 22km/h, 94% humidity, cloud cover 6, rain 0, cold overnight. 15-17°C, wind 11-14km/h, 60-75% humidity, cloud cover 0-1, no rain.
5	9 October 2024 11 October 2024	13-14°C, wind 7km/h, 91-96% humidity, cloud cover 7-8, brief light drizzle during survey. 11-12°C, wind 10km/h, 57% humidity, cloud cover 0-1, rain 0, very cold overnight.
6	15 October 2024 16 th October 2024	12°C, wind 13km/h, 94-95% humidity, cloud cover 8, rain 0, misty and cold overnight. 14°C, wind 13km/h, wind direction SSE, 100% humidity, cloud cover 8, heavy mist/fog, rain 1 prior to survey and light drizzle at start of survey, cold overnight.

Visit Number	Dates	Weather Conditions
7	23 rd October 2024	12°C, wind 8km/h, wind direction SSW, humidity 91%, cloud cover 1. rain 0, cold overnight, wet ground and wet refugia.
	24 th October 2024	13°C, wind 16km/h, wind direction SSW, humidity 88%, cloud cover 1, rain 0, cold overnight, clear skies with mist, with chilly conditions but warming up.

2.3 LIMITATIONS

- 2.3.1. Whilst the Froglife guidance⁶ forms the standard industry practice, it should be noted that it is not specifically designed for use in demonstrating the presence or absence of reptiles from a development site, rather the focus is on identifying key reptile sites and increasing recording of reptiles over a longer period of time. For this reason, the density of refugia has been increased to increase confidence in results, should likely absence be concluded. This report only refers to reptiles and does not address other protected species considerations on Site.
- 2.3.2. Survey of all zones could not be completed on 02 and 03 October 2024 (visit 4) due to the presence of shooting within the Lake Zone preventing surveyors from fully accessing the Site. This is not considered a limitation to the results, as reptiles were observed in the Lake Zone on multiple other surveys which gives an indication of the overall activity across this area of the Site.
- 2.3.3. During the surveys on 12 and 13 September (visit 2), temperatures dropped briefly to 9°C and 7°C respectively, and on 19 September (visit 3) temperatures rose briefly to 19°C. These temperatures are outside the optimum range for reptile survey; however, this is not deemed a significant limitation to the survey as the temperature was within the optimum range for the majority of the survey and reptile activity was still recorded.
- 2.3.4. Intermittent light showers occurred on 05 September 2024 (visit 1), but this is not deemed a significant limitation given several common lizard were observed basking during the survey and light rain showers may seek to offer opportunities to record sheltering reptiles beneath refugia.
- 2.3.5. Although the weather conditions for the 23 and 24 October (Visit 7) were within the required temperature range with no rain, the ground was wet during the surveys with cold temperatures overnight. No reptiles were observed during this visit. However, for the purpose of confirming reptile presence and species composition across the Site, it is considered sufficient information was gathered during Visits 1-6 to inform specific mitigation that may be required.

3 RESULTS

- 3.1.1. Refer to the PEA report (see **Appendix 6.1: Preliminary Ecological Appraisal Report (Volume 3)**) for desk study results specific to reptiles.
- 3.1.2. Results are shown in **Table 3-1**. In total, 25 adult common lizard, 10 juvenile common lizards and four sub-adult common lizards were present on-Site, and two adult grass snakes. The observations of common lizard were concentrated in Area 10 of the Core Zone, and Area 8 of the Lake Zone. The grass snakes were recorded in Area 12 of the Core Zone and Area 4 of the Lake Zone. This confirms the previous assumption that a small population of breeding common lizard and of grass snake are present within the Site.
- 3.1.3. No reptiles were recorded on 02 October (visit 4), 16 October (visit 6), 23 October (visit 7) and 24 October 2024 (visit 7).
- 3.1.4. Incidental sightings of other species were also recorded alongside reptile results. Across all survey visits, this included 34 common toad *Bufo bufo*, two common frogs *Rana temporaria*, 95 small mammals (mice, bank/field voles, shrews), two brown argus butterflies *Aricia agestis*, 33 great crested newts *Triturus cristatus* (including 13 juveniles, 17 adults and three sub-adults) and 35 smooth *Lissotriton vulgaris* and palmate *Lissotriton helveticus* newts.
- 3.1.5. Weather conditions during surveys ranged between 7°C and 19°C in temperature (with most of each visit completed within the optimal 10-18°C range), with cloud cover of between 0 and 8 oktas (**Table 3-1**).

Incidental results

- 3.1.6. A number of other ecological surveys have been undertaken across the Site. During some of these, incidental records of reptiles have been recorded. These records include three grass snakes identified during the otter and water vole surveys undertaken between June to September 2024, all within the Core Zone, see **Figure 2: Reptile Survey Results** of **Annex 1: Figures**.

Table 3-1 – Reptile Survey Results

Survey Visit	Date	Refugia Number/Area/Zone	Observation
1	04 September 2024	519/Area 10/Core Zone	One adult common lizard under refugia
1	04 September 2024	520/Area 10/Core Zone	One juvenile common lizard under refugia
1	04 September 2024	516/Area 10/Core Zone	One adult common lizard under refugia
1	04 September 2024	96/Area 15/West Gateway Zone	One juvenile common lizard on top of refugia
1	05 September 2024	13/Area 12/Core Zone	One adult grass snake next to refugia close to pond
1	05 September 2024	3/Area 12/Core Zone	One adult common lizard under refugia
1	05 September 2024	296/Area 8/Lake Zone	One adult common lizard under refugia
1	05 September 2024	295/Area 8/Lake Zone	One adult common lizard under refugia
1	05 September 2024	232/Area 6/Lake Zone	One juvenile common lizard under refugia
2	12 September 2024	383/Area 10/Core Zone	One adult common lizard under refugia
2	12 September 2024	256/Area 8/Lake Zone	Two adult common lizards under refugia
2	12 September 2024	272/Area 8/Lake Zone	One adult common lizard under refugia
2	12 September 2024	Area 8/Lake Zone	Two adult common lizards basking on discarded metal on lake side.
2	13 September 2024	219/Area 5/Lake Zone	One juvenile common lizard on top of refugia
2	13 September 2024	302/Area 8/Lake Zone	One adult common lizard under refugia
2	13 September 2024	310/Area 8/Lake Zone	One adult common lizard under refugia
2	13 September 2024	Area 8/Lake Zone	One adult common lizard basking on discarded metal on lake side.
3	18 September 2024	256/Area 8/Lake Zone	One sub-adult common lizard under refugia

Survey Visit	Date	Refugia Number/Area/Zone	Observation
3	18 September 2024	258/Area 8/Lake Zone	Two juveniles and one adult common lizard under refugia
3	18 September 2024	223/Area 8/Lake Zone	One adult common lizard under refugia
3	18 September 2024	310/Area 8/Lake Zone	One sub-adult common lizard under refugia
3	18 September 2024	286/Area 8/Lake Zone	One adult common lizard under refugia
3	18 September 2024	201/Area 5/Lake Zone	One adult common lizard under refugia
3	19 September 2024	516/Area 10/Core Zone	One adult common lizard under refugia
4	03 October 2024	508/Area 10/Core Zone	One sub-adult common lizard under refugia
4	03 October 2024	542/Area 10/Core Zone	One sub-adult common lizard on top of refugia
4	03 October 2024	576/Area 10/Core Zone	One juvenile common lizard under refugia
5	09 October 2024	175/Area 13/Core Zone	One adult common lizard under refugia
5	11 October 2024	478/Area 8/Lake Zone	One adult common lizard under refugia
5	11 October 2024	502/Area 8/Lake Zone	One adult common lizard under refugia
5	11 October 2024	529/Area 8/Lake Zone	One adult common lizard ran over top of refugia
5	11 October 2024	590/Area 5/Lake Zone	One adult common lizard under refugia
5	11 October 2024	424/Area 3/Lake Zone	One adult common lizard under refugia
5	11 October 2024	Area 4/Lake Zone	One adult grass snake – seen after end of reptile survey.
6	15 October 2024	536/Area 9/Lake Zone	One juvenile common lizard under refugia
6	15 October 2024	571/Area 16/Lake Zone	Two juvenile common lizards under refugia

Annex 1

FIGURES

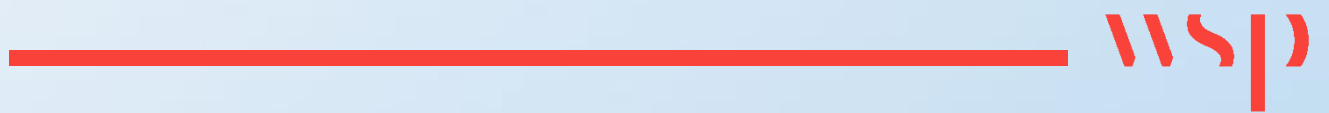
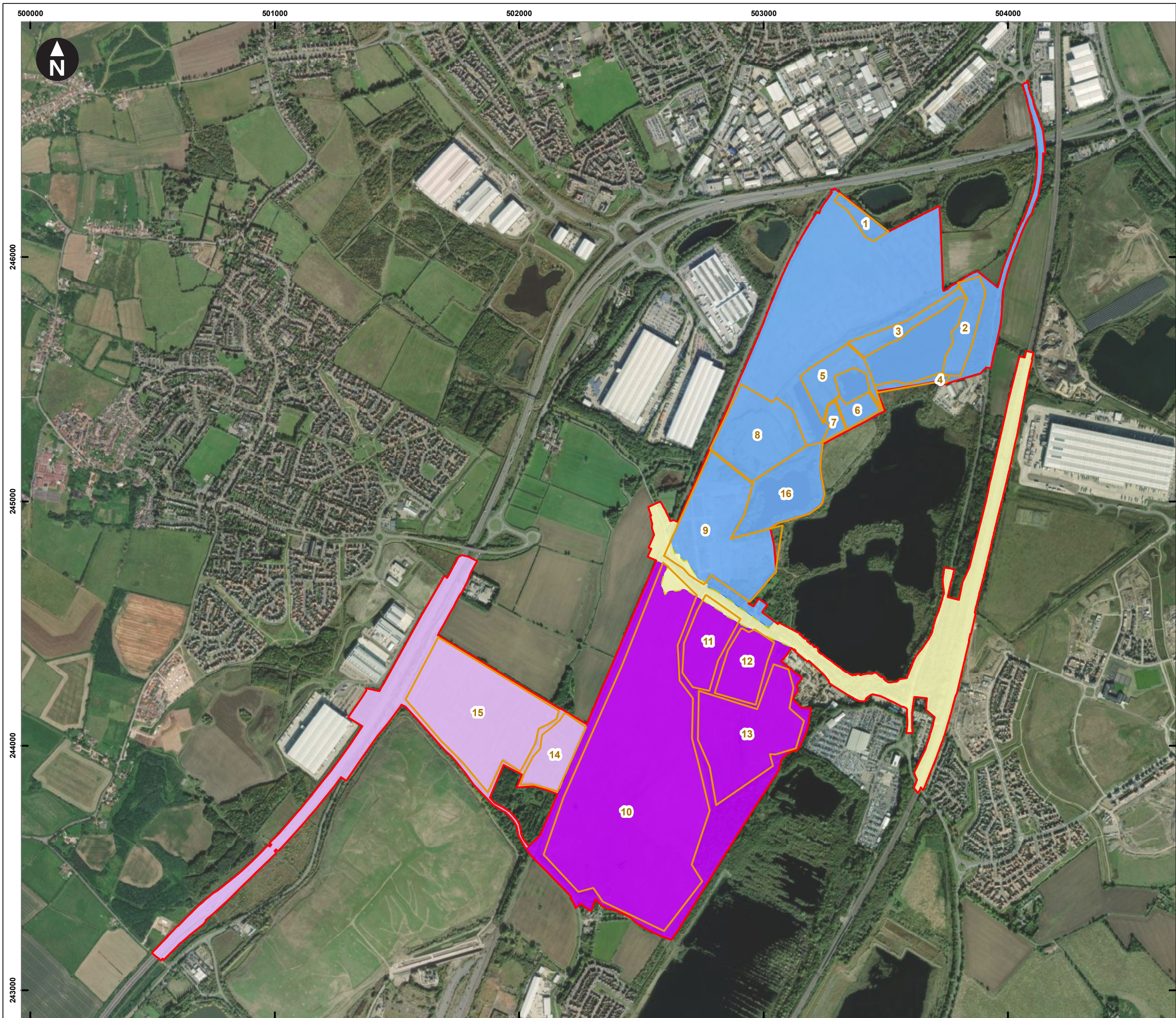




Figure 1 – Site Location and Survey Areas



Legend

- Site boundary
- Reptile Survey Area
- Core Zone
- East Gateway Zone
- Lake Zone
- West Gateway Zone

0 200 400 600 800 m

Scale at A3: 1:15,000

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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Figure 1
Site Location and Survey Areas

May 2025





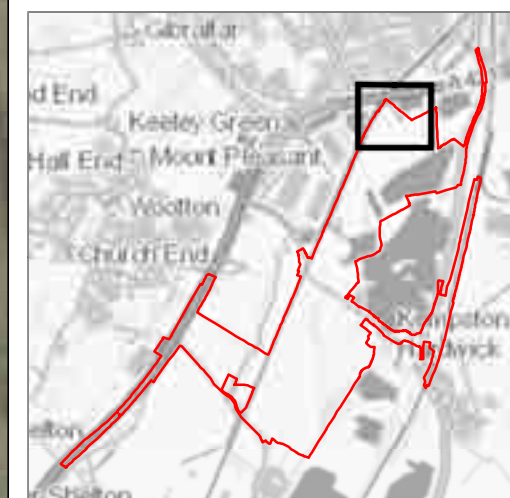
Figure 2 – Reptile Survey Results

246000



Legend

- Site boundary
- Artificial refugia
- Common lizard - Unknown age
- Common lizard - Adult
- Common lizard - Sub-adult
- Common lizard - Juvenile
- Grass snake - Unknown age
- Grass snake - Adult



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Scale at A3: 1:2,000

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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

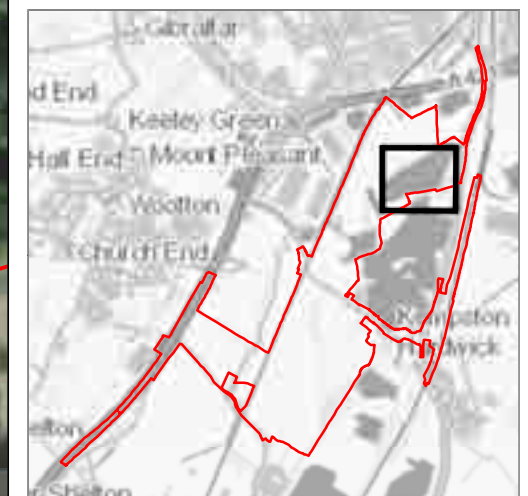
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Figure 2
Reptile Survey Results



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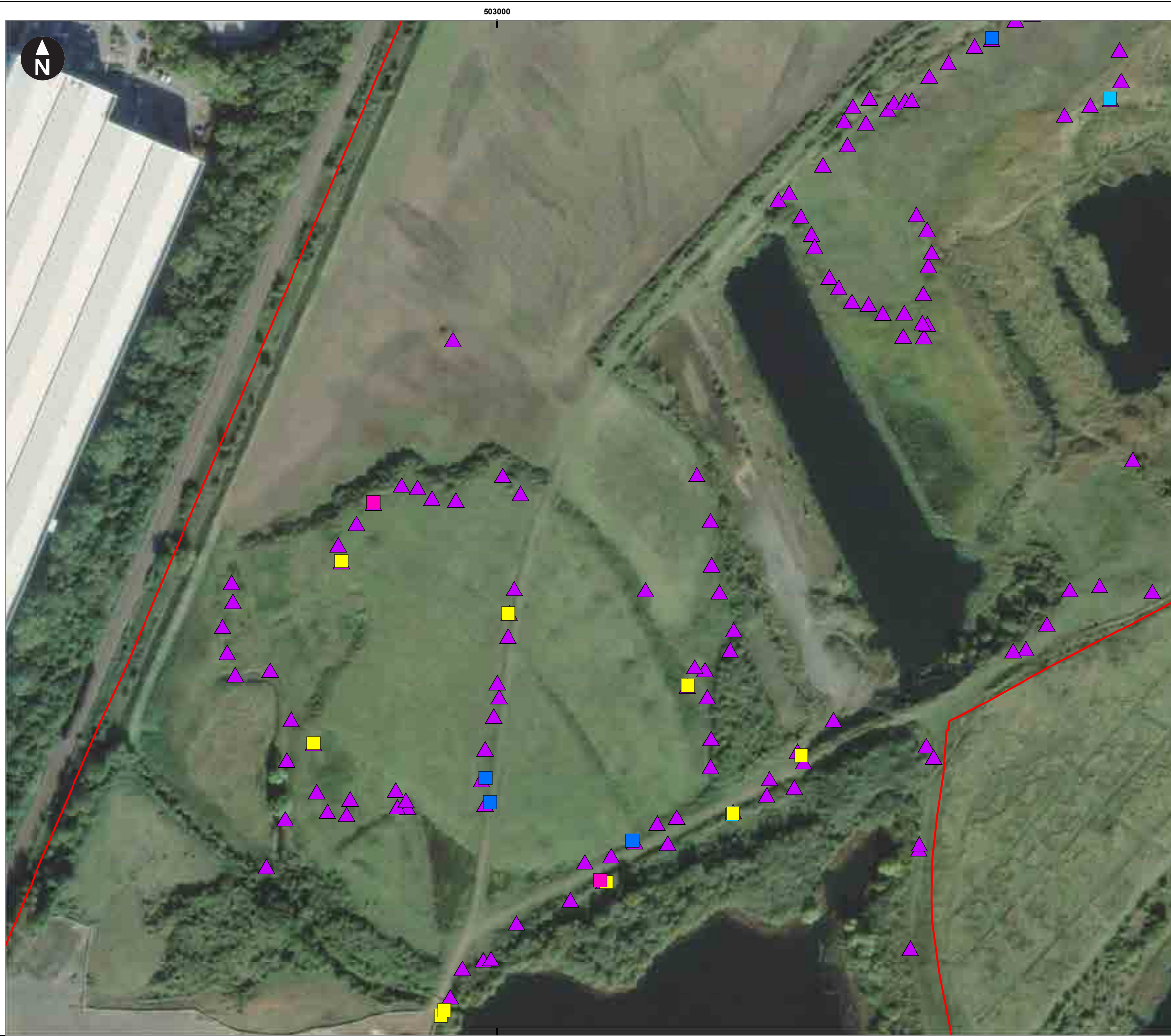
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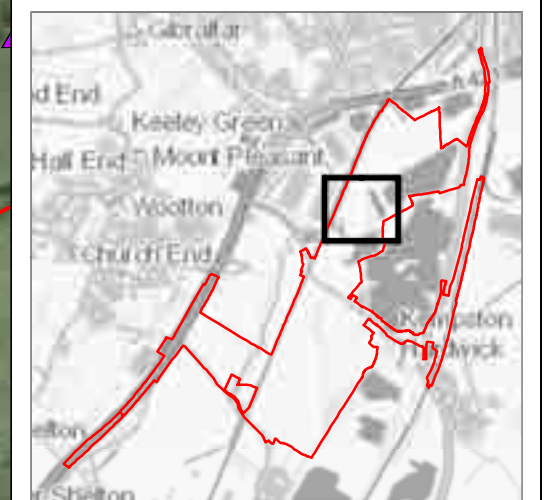
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Figure 2
Reptile Survey Results



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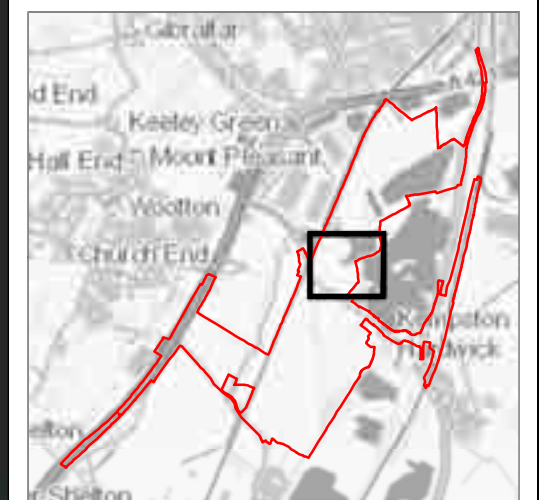
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Figure 2
Reptile Survey Results



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



Figure 2
Reptile Survey Results

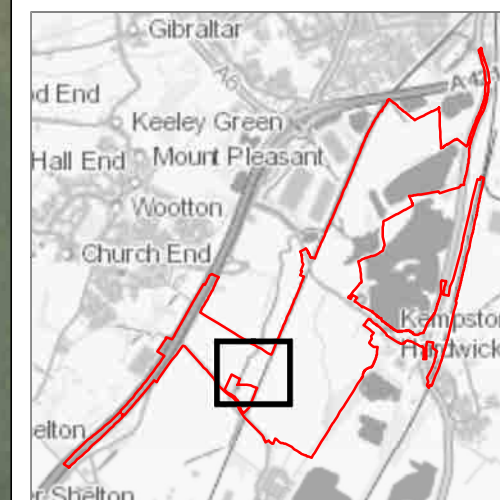
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Legend

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-  Common lizard - Adult
-  Common lizard - Sub-adult
-  Common lizard - Juvenile
-  Grass snake - Unknown age
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0 50 100 m

Scale at A3: 1:2,000

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



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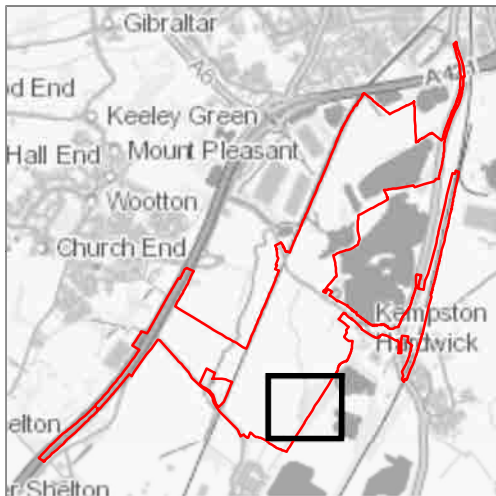
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Figure 2
Reptile Survey Results



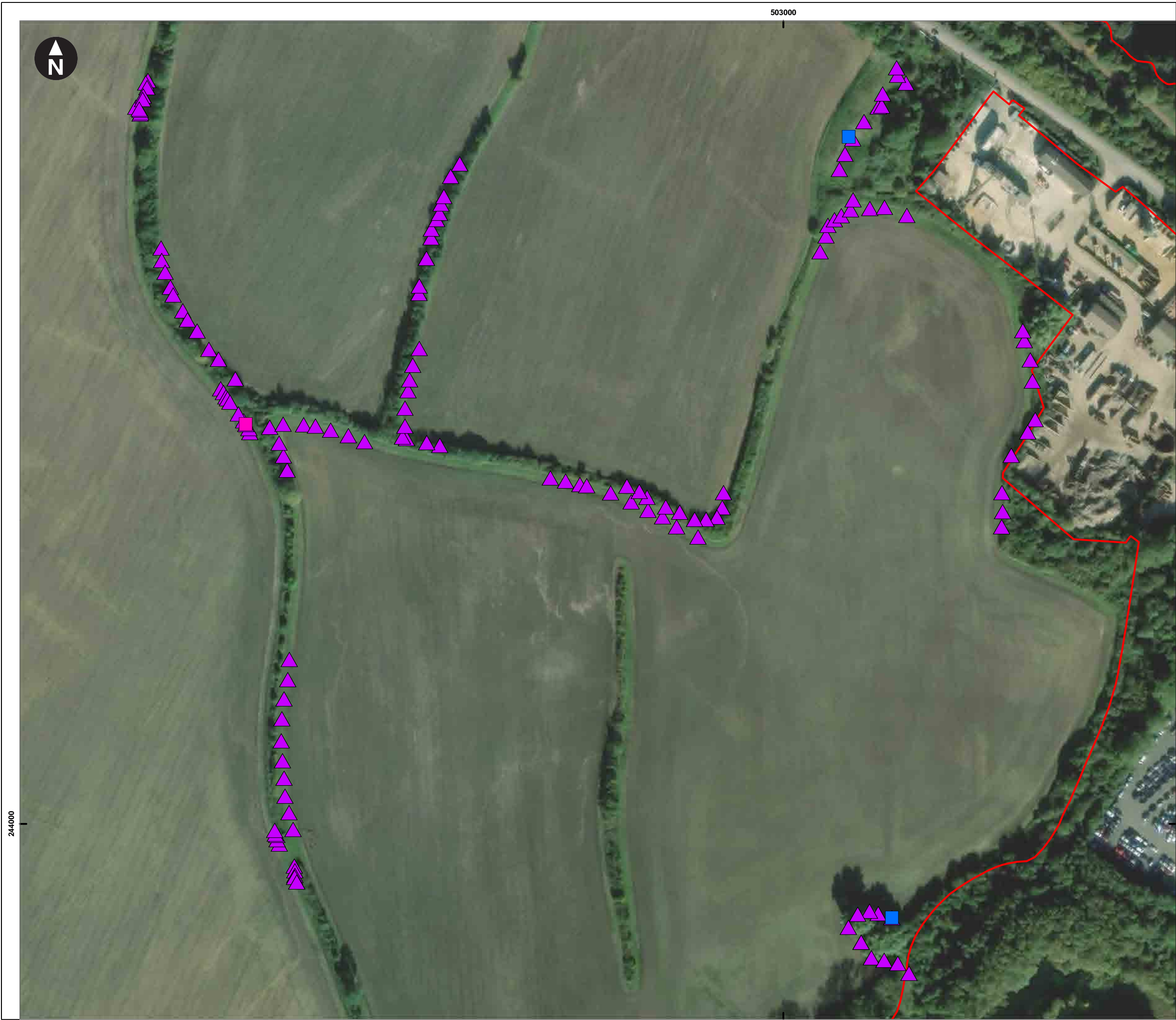
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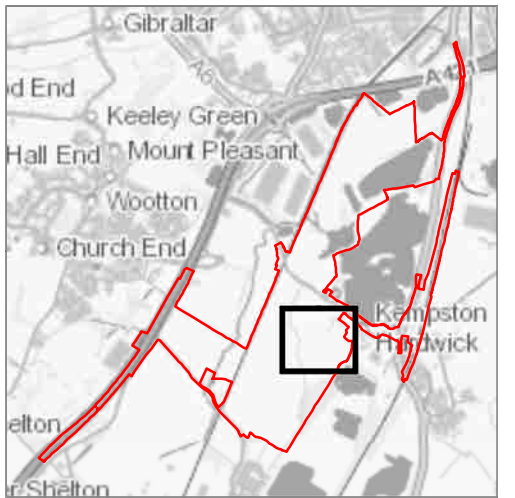
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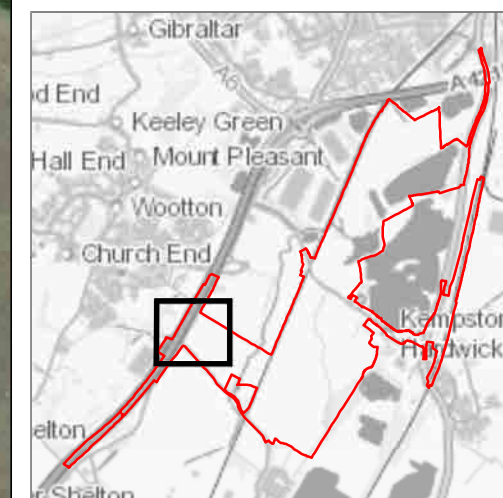
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Figure 2
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