

# St Michael's Convent, 354 London Road, Waterlooville, PO7 7TF

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## Reptile Survey & Mitigation Strategy Report

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**August 2012**

Hampshire Ecological Services Ltd  
*Consultant Ecologists & Chartered Environmentalists*

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**Reptile Survey & Mitigation Strategy**  
**St Michael's Convent, 354 London Road, Waterlooville, PO7 7TF**  
**for**  
**Linden Homes**

| <b>Reference: St Michaels Convent, Waterlooville</b> |                 |                                                                                     |                 |                                                                                      |                 |
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This report represents sound industry practice; reports and recommends correctly, truthfully and objectively; is appropriate given the local site conditions, scope of works proposed and resources allocated to us by the client; and avoids invalid, biased, and exaggerated statements.

The author disclaims any responsibility to the client and others in respect of any matters outside the scope of the above. This report is confidential to the client and the author accepts no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

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**EXECUTIVE SUMMARY**

1. This report describes surveys, and a subsequent mitigation strategy, for reptiles carried out for Linden Homes in connection with a proposal to convert parts of existing convent buildings and a chapel and to build new dwellings at St Michaels Convent, 354 London Road, Waterlooville, Hampshire, PO7 7TF (approximate Ordnance Survey Grid Reference SU685098). The location of the site is shown in *Figures 1 and 2 in Section 10*.
2. The site was initially assessed as containing habitat suitable for reptiles on the 27<sup>th</sup> and 28<sup>th</sup> March 2012 by Victoria Russell MIEEM from Hampshire Ecological Services Ltd. This was confirmed by the observation of a slow-worm during the visit on the 27<sup>th</sup> March 2012. The location of the suitable habitat is shown in *Figure 3 in Section 10*. Because reptiles are legally protected from harm (killing or injury), it was necessary to assess the population size and assess whether any other species of reptile are present on site.
3. A total of 106 artificial refugia were laid on the 20<sup>th</sup> April 2012 in suitable reptile habitat and left for a ten-day settling period. Seven visits to determine presence/ likely absence of reptiles were carried out between the 30<sup>th</sup> April and the 3<sup>rd</sup> June 2012. The raw data is given in *Table 4.2.1 in Section 4* and the location of the artificial refugia are given in *Figure 4 in Section 10*.
4. The presence of slow-worms (*Anguis fragilis*) was confirmed. A total of 92 slow-worms were recorded (assuming all slow-worms that escaped were separate individuals only observed once). The maximum number of slow-worms recorded in a single visit was 28. Based on the results, a medium population of slow-worms (50-100) is present, although it is approaching a large population class size. In addition, common frogs and a palmate newt were also recorded.
5. A mitigation strategy (an *in situ* translocation) has been devised prior to site clearance to ensure compliance with the law and planning policy. The strategy has two main aims:
  - to avoid harm to reptiles; and
  - prevent any net loss of local conservation status.
6. The strategy involves the removal of captured reptiles to a temporarily reptile-fenced receptor site, prior to works. The location of the receptor site is shown in *Figure 5 in Section 10*.
7. The area of suitable reptile habitat to be affected is c.3073m<sup>2</sup>. The scheme will involve the removal of captured reptiles to an area of suitable habitat approximately 1940m<sup>2</sup> adjacent to Hermitage Stream on the east side of the site (see *Figure 5 in Section 10*). Although the receptor site should generally be similar to (or greater than) in size to that to be lost, the reduction in area is considered acceptable because the donor site is mostly the margins of short-mown grassland and the receptor site can be enhanced and managed for reptiles long-term. An adjacent spillover receptor site has also been indentified for use in the unlikely event of greater

than expected numbers (see *Figure 6* in *Section 10*).

8. Prior to the translocation the receptor site will be enhanced by allowing the grass to grow up. This will result in a denser vegetation and grass-litter with greater cover and foraging potential. In addition, several log piles will be added to the receptor area to create additional refuges and hibernacula.
9. The translocation of the reptiles will commence between March and September and terminate when no reptiles are found in the search area on five consecutive suitable-weather days, provided a minimum of 30 suitable trapping days has already taken place (and careful interpretation of the capture depletion curve demonstrates the majority of reptiles have been translocated). A destructive search will then be undertaken under strict ecological supervision.
10. The receptor site will be managed sympathetically for reptiles. Management of trees and scrub may be needed to stop the receptor site becoming too shaded to support reptiles, but they are also important habitats and therefore will not be completely removed.
11. There is already housing surrounding the site. Therefore, the area of suitable reptile habitat is isolated without connections to the wider countryside and will not become more isolated as a result of the development.
12. HGBI guidelines (1998), as mentioned in Natural England's *Standing Advice for Protected Species: Reptiles* (2011), recommend a 5-year monitoring programme of translocation schemes to assess success. Due to the fact it can take several years for slow-worms to breed, it is recommended that monitoring is staggered with one survey every five years for 25 years. However, if impractical, the monitoring should be carried out annually for five years as an alternative. This can be conditioned in any planning consent.

## **INTRODUCTION**

### **2.1 Purpose of this report**

This report describes surveys for reptiles carried out by Hampshire Ecological Services Ltd for Linden Homes in connection with a proposal to convert parts of existing convent buildings and a chapel and to build new dwellings at St Michaels Convent, 354 London Road, Waterlooville, Hampshire, PO7 7TF (approximate Ordnance Survey Grid Reference SU685098).

The location of the site is shown in *Figures 1 and 2* in *Section 10*.

Surveys aimed to:

- identify if there is suitable habitat for reptiles;
- identify species present; and
- estimate species populations.

In addition, this report provides details of the proposed mitigation, which includes a translocation scheme, habitat creation and management.

### **2.2 Ecological context and site description**

The site consists of a chapel and the buildings and grounds of the former St Michael's convent. The buildings and extensions date from the Victorian period to the 1960's.

The convent and its outbuildings are located in the centre of the site surrounded by hardstanding and paving. The majority of the site is lawns, flowerbeds and ornamental planting. There is also an orchard and a strip of woodland along part of the southern boundary. The woodland connects to Hermitage Stream which runs along the eastern boundary. To the north this connects to the woodland of Queen's Inclosure and Park Wood SINC (on the opposite side of the A3 to Queen's Inclosure).

The site lies in central Waterlooville, off the A3, London Road. It is surrounded by housing with Hermitage Stream along its eastern boundary. There is also housing on the opposite side of Hermitage Stream. The B2150 is located to the south, separated from the site by a single row of houses in Brookdale Close. The surrounding area is the urban and sub-urban area of Waterlooville with the A3(M) motorway to the east. Beyond Waterlooville to the west there is farmland.

### **2.3 Species known in the region**

The UK's four most widespread reptile species are present throughout the region (Beebee & Griffiths, 2000); these are common lizard (*Lacerta vivipara*), adder (*Vipera berus*), grass snake (*Natrix natrix*), and slow-worm (*Anguis fragilis*). In addition, the UK's two rarer species of reptile

sand lizard (*Lacerta agilis*) and smooth snake (*Coronella austriaca*) are also known in the region, (mostly confined to heathland). It is the widespread species which are the subject of this report.

## **2.4 Legal protection**

The four widespread reptile species are listed under *Schedule 5* of the *Wildlife and Countryside Act 1981 (as amended)*, in respect of *section 9(5)* and part of *9(1)*. This protection was extended by the *Countryside and Rights of Way Act 2000*.

The legislation makes it an offence to:

- intentionally, or recklessly, kill or injure any of the above species, and/or;
- sell, or attempt to sell, any part of the species, alive or dead.

The two rarer species receive greater protection under both the *Wildlife and Countryside Act* and also from the *Conservation of Habitats & Species Regulations 2010* which gives them full protection under *Regulation 39*.

In addition to the above, *Section 40* of the *Natural Environment and Rural Communities Act (2006)* imposes a new duty on all public authorities to have regard for biodiversity.

## **2.5 Life cycle & ecology**

Reptile activity is highly seasonal; they hibernate over the winter (October to March) and are active over the summer months. They become increasingly active as temperatures increase in spring, and in most years they are fully active by mid-April. Reproduction varies between species, but generally peaks in mid-summer when reptiles are at their most active. In late September/ October, activity begins to decrease as reptiles seek frost-free refuges for hibernation.

Reptiles rely on conditions that allow them to maintain their body temperature (they need to be able to bask and avoid extremes of temperature). Habitats need to provide a structure that allows reptiles to bask or otherwise warm up using the sun's energy, but also to avoid extremes of heat and cold. Features that help them achieve a stable body temperature include access to direct sunlight and shelter from the elements, such as wind and excessive heat. In addition, they require sufficiently large populations of prey species (e.g. soft-bodied invertebrates for slow-worms), cover to avoid predators and suitable hibernation sites.

## **2.6 Structure of this report**

- The remainder of this report is structured as follows:
- *Section 3* describes the methodology;
- *Section 4* describes the results;
- *Section 5* gives evaluation and interpretation;
- *Section 6* gives details of the proposed translocation scheme;
- *Section 7* gives details of the proposed habitat creation and management;

- *Section 8* provides information on safeguarding the site for the future;
- *Section 9* provides information on monitoring to be carried out on the success of the translocation;
- *Section 10* provides figures;
- *Section 11* provides photos of the sites; and
- *Section 12* provides references.

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**METHODOLOGY****3.1 General**

The surveys centred on assessing habitat suitability, followed by a search for individuals using artificial refugia.

**3.2 Date(s), times and weather**

An initial site survey and Phase 1 Habitat Survey was carried out during the daytime on the 27<sup>th</sup> and 28<sup>th</sup> of March 2012. The weather was warm and sunny on both occasions.

Seven subsequent visits were carried out for the purpose of assessing the reptile population. These were carried out between the 30<sup>th</sup> April and the 3<sup>rd</sup> June 2012. The weather conditions for each visit are given in *Table 4.2.1* in *Section 4*.

**3.3 Personnel**

The habitat was initially assessed on the 27<sup>th</sup> and 28<sup>th</sup> of March 2012 by Victoria Russell MIEEM who is a full member of the Institute of Ecology and Environmental Management (IEEM). She has over 14 years experience in ecological consultancy and is a highly competent botanist trained in Phase 1 Habitat Survey and protected species surveys (including botanical expertise in *Schedule 9* species). She was assisted by a second ecologist Joseph Jenkins MSc GradIEEM.

The reptile surveys were carried out by Victoria Russell MIEEM, Joseph Jenkins MSc GradIEEM and Nicola Pyle AIEEM all of whom are experienced in carrying out reptile surveys and collecting biometric data.

All staff are members of IEEM and adhere to its *Code of Professional Conduct*.

**3.4 Habitat Suitability**

Different species of reptile have varying habitat preferences and requirements as outlined below (Beebee & Griffiths 2000).

- Common lizards use a variety of habitats from woodland glades to walls and pastures; although one of their favoured habitats is rough grassland.
- Slow-worms utilise similar habitats to common lizards, and are often found in rough grassland, gardens, and derelict land.
- Grass snakes have broadly similar requirements to common lizards, although they have a greater reliance on ponds and wetlands, where they prey on common frogs.
- Adders use a variety of fairly open habitats (with some cover available) but are most often found in dry heath and woodland edge.

The site was assessed for widespread species of reptile, with particular attention paid to those features that could be used as basking areas (*e.g.* south-facing slopes), hibernation sites (*e.g.* banks, walls, piles of hardcore) and opportunities for foraging (rough grassland and scrub).

Given the location and the habitat available on and adjacent to the sites (rough grassland, tall-herb vegetation, hedges, woodland and scrub), the species most likely to be using the sites is slow-worm (confirmed during the survey on the 27<sup>th</sup> April 2012).

### **3.5 Artificial refugia survey**

Standard methods were used, which involves placing 100 x 60cm sheets of heavy-duty roofing felt (artificial refugia) in areas where they were most likely to be used by reptiles (*e.g.* at the edges of bramble scrub and in tussocky grassland, *etc*) so that all suitable habitat present was represented. So far as possible they were placed on slightly uneven ground so as not to lie completely flat (creating a varied microclimate). It is common practice to lay out artificial refugia some days or weeks prior to the commencement of a survey or translocation so that reptiles become habituated to their presence.

A total of 106 pieces of heavy-duty roofing felt were placed around the site on the 20<sup>th</sup> April and left for a ten-day settling period. The locations of the refugia are shown in *Figure 4*.

The refugia were checked on seven suitable days between the 30<sup>th</sup> April and the 3<sup>rd</sup> June 2012.

Days with heavy rain are generally accepted as unsuitable, though sunny periods after rain may be ideal because reptiles may emerge from cover to bask. Slow-worms are less sensitive than the other species, and are known to use artificial refugia in a wider range of weather conditions.

## RESULTS

### 4.1 Suitable habitat

Although the majority of the lawns are regularly mown, there are areas of suitable habitat for widespread species of reptiles (such as slow-worm), particularly around the edges of the site. These include areas of longer grassland, scrub and the bases of the ornamental planting and hedges. The longer grassland provides suitable foraging habitat while the woody vegetation provides suitable foraging and hibernating habitat. In addition, Hermitage Stream and its bank-side vegetation is suitable habitat for grass snakes.

The location of suitable reptile habitat is illustrated in *Figure 3* in *Section 10*.

### 4.2 Artificial refugia survey

A total of 92 slow-worms were recorded within suitable habitat across the site. This assumes that all slow-worms that escaped were separate individuals that were only observed once. The maximum number of slow-worms recorded in a single visit was 28. *Table 4.2.1.* below presents the results of the survey and *Figure 4* in *Section 10* gives the location of the artificial refugia (including where slow-worms were recorded).

As a result of surveys, it was concluded that a medium population of slow-worms (50-100) was present, although it is approaching a large population class size.

In addition, a single palmate newt and seven common frogs were recorded.

*Table 4.2.1. Results of artificial refugia survey. S-w = Slow-worm. Cf = Common frog. Pn = Palmate newt.*

| Date     | Time of check | Temp (C <sup>0</sup> ) | Species | No. | Sex & Age    | SV length (mm) | VT length (mm) | Refugia no. | General weather        |
|----------|---------------|------------------------|---------|-----|--------------|----------------|----------------|-------------|------------------------|
| 30/04/12 | 11:30         | 11                     | S-w     | 1   | Adult female | 150            | 120            | 43          | Sunny, 25% cloud cover |
|          |               |                        | S-w     | 2   | Adult female | 180            | 90             | 46          |                        |
|          |               |                        | S-w     | 1   | Adult male   | Escaped        |                | 46          |                        |
|          |               |                        | S-w     | 3   | Adult male   | 150            | 105            | 73          |                        |
|          |               |                        | Cf      | 1   | Adult        | -              | -              | 73          |                        |
| 01/05/12 | 15:30         | 16                     | S-w     | 1   | Adult male   | 120            | 150            | 21          | Sunny, 5% cloud cover  |
|          |               |                        | S-w     | 1   | Adult female | 160            | 140            | 43          |                        |
|          |               |                        | S-w     | 1   | Adult female | 180            | 90             | 46          |                        |

## REPTILE SURVEY &amp; MITIGATION STRATEGY

|          |       |    |     |   |              |         |     |               |                        |
|----------|-------|----|-----|---|--------------|---------|-----|---------------|------------------------|
|          |       |    | S-w | 2 | Adult male   | Escaped |     | 48            |                        |
|          |       |    | S-w | 2 | Adult female | 140     | 150 | 48            |                        |
|          |       |    | Cf  | 1 | Adult        | -       | -   | 70            |                        |
|          |       |    | S-w | 1 | Adult female | 150     | 180 | 83            |                        |
| 11/05/12 | 16:50 | 19 | S-w | 1 | Adult male   | 220     | 96  | 22            | Sunny, 60% cloud cover |
|          |       |    | S-w | 1 | Adult female | 170     | 198 | 23            |                        |
|          |       |    | S-w | 1 | Adult male   | 140     | 80  | 27            |                        |
|          |       |    | S-w | 1 | Adult male   | Escaped |     | 30            |                        |
|          |       |    | S-w | 1 | Adult male   | 170     | 140 | 43            |                        |
|          |       |    | S-w | 1 | Adult female | 150     | 97  | Tin adj to 45 |                        |
|          |       |    | S-w | 1 | Adult female | 160     | 87  | 60            |                        |
|          |       |    | S-w | 1 | Adult male   | 185     | 99  | 58            |                        |
|          |       |    | S-w | 1 | Adult female | 175     | 105 | 64            |                        |
|          |       |    | S-w | 1 | Juvenile     | -       | -   | 87            |                        |
|          |       |    | S-w | 1 | Adult male   | 145     | 14  | 94            |                        |
|          |       |    | S-w | 1 | Juvenile     | -       | -   | 93            |                        |
|          |       |    | S-w | 1 | Adult male   | 130     | 54  | 92            |                        |
| 16/05/12 | 13:28 | 15 | S-w | 1 | Adult female | 160     | 192 | 23            | Sunny, 75% cloud cover |
|          |       |    | S-w | 1 | Juvenile     | Escaped |     | 23            |                        |
|          |       |    | S-w | 1 | Adult male   | 160     | 80  | 27            |                        |
|          |       |    | S-w | 1 | Juvenile     | Escaped |     | 30            |                        |
|          |       |    | S-w | 1 | Adult male   | 160     | 90  | Tin adj to 45 |                        |
|          |       |    | S-w | 1 | Adult female | 155     | 90  | Tin adj to 45 |                        |
|          |       |    | S-w | 1 | Adult male   | 170     | 140 | 43            |                        |
|          |       |    | S-w | 1 | Juvenile     | Escaped |     | 46            |                        |
|          |       |    | S-w | 1 | Adult male   | 200     | 198 | 48            |                        |
|          |       |    | S-w | 1 | Adult male   | 170     | 95  | 58            |                        |
|          |       |    | S-w | 1 | Adult female | 160     | 87  | 60            |                        |
|          |       |    | Cf  | 1 | Adult        | -       | -   | 79            |                        |
|          |       |    | Cf  | 1 | Adult        | -       | -   | 81            |                        |

## REPTILE SURVEY &amp; MITIGATION STRATEGY

|          |       |    |     |   |              |         |     |    |                         |
|----------|-------|----|-----|---|--------------|---------|-----|----|-------------------------|
|          |       |    | S-w | 1 | Adult male   | 145     | 192 | 81 |                         |
|          |       |    | S-w | 1 | Juvenile     | -       | -   | 87 |                         |
|          |       |    | S-w | 1 | Juvenile     | 60      | 70  | 89 |                         |
|          |       |    | S-w | 1 | Adult female | 130     | 65  | 92 |                         |
|          |       |    | S-w | 1 | Juvenile     | 55      | 60  | 93 |                         |
|          |       |    | S-w | 1 | Adult male   | 140     | 131 | 94 |                         |
| 22/05/12 | 11:30 | 22 | S-w | 1 | Adult male   | Escaped |     | 43 | Clear, sunny            |
|          |       |    | S-w | 1 | Juvenile     | Escaped |     | 46 |                         |
|          |       |    | S-w | 1 | Adult male   | 95      | 150 | 47 |                         |
|          |       |    | S-w | 1 | Adult female | Escaped |     | 47 |                         |
|          |       |    | S-w | 1 | Adult male   | 165     | 105 | 55 |                         |
|          |       |    | S-w | 1 | Adult female | 135     | 165 | 65 |                         |
|          |       |    | S-w | 1 | Adult male   | 155     | 190 | 83 |                         |
|          |       |    | S-w | 1 | Juvenile     | Escaped |     | 80 |                         |
|          |       |    | S-w | 1 | Adult female | 160     | 130 | 81 |                         |
| 27/05/12 | 10:07 | 16 | S-w | 1 | Adult female | 185     | 140 | 21 | Clear, sunny            |
|          |       |    | S-w | 1 | Adult female | Escaped |     | 23 |                         |
|          |       |    | S-w | 1 | Adult female | 135     | 165 | 27 |                         |
|          |       |    | S-w | 1 | Adult male   | Escaped |     | 29 |                         |
|          |       |    | S-w | 1 | Juvenile     | 85      | 95  | 30 |                         |
|          |       |    | S-w | 1 | Juvenile     | 105     | 130 | 30 |                         |
|          |       |    | S-w | 1 | Adult male   | 200     | 95  | 44 |                         |
|          |       |    | S-w | 1 | Sub-adult    | Escaped |     | 46 |                         |
|          |       |    | S-w | 1 | Adult female | 185     | 150 | 47 |                         |
|          |       |    | S-w | 1 | Adult male   | 160     | 115 | 56 |                         |
|          |       |    | S-w | 1 | Adult male   | 150     | 85  | 57 |                         |
|          |       |    | S-w | 1 | Adult female | 150     | 190 | 58 |                         |
|          |       |    | S-w | 1 | Adult female | 130     | 170 | 65 |                         |
|          |       |    | S-w | 1 | Juvenile     | 60      | 70  | 89 |                         |
| 03/06/12 | 10:46 | 14 | S-w | 1 | Adult female | 180     | 135 | 21 | 80% cloud, light breeze |
|          |       |    | S-w | 1 | Adult female | 150     | 180 | 22 |                         |

|  |  |  |     |   |                                     |         |     |       |
|--|--|--|-----|---|-------------------------------------|---------|-----|-------|
|  |  |  | S-w | 1 | Adult male                          | 200     | 50  | 23    |
|  |  |  | S-w | 2 | Juvenile                            | Escaped |     | 23    |
|  |  |  | S-w | 1 | Adult female                        | 135     | 165 | 27    |
|  |  |  | S-w | 2 | 1 x adult female,<br>1 x adult male | Mating  |     | 27    |
|  |  |  | S-w | 1 | Adult male                          | 160     | 190 | 28    |
|  |  |  | S-w | 1 | Adult male                          | 150     | 60  | 30    |
|  |  |  | S-w | 1 | Juvenile                            | Escaped |     | 30    |
|  |  |  | S-w | 1 | Sub-adult                           | 95      | 65  | 31    |
|  |  |  | S-w | 1 | Juvenile                            | 55      | 56  | 44    |
|  |  |  | S-w | 1 | Adult male                          | 170     | 145 | 46    |
|  |  |  | S-w | 1 | Adult male                          | 150     | 170 | 46    |
|  |  |  | S-w | 1 | Sub-adult                           | 110     | 140 | 47    |
|  |  |  | S-w | 1 | Adult male                          | 160     | 95  | 47    |
|  |  |  | S-w | 1 | Adult                               | Escaped |     | 47    |
|  |  |  | S-w | 1 | Adult female                        | Escaped |     | 57    |
|  |  |  | Cf  | 1 | Adult                               | -       | -   | Nr 57 |
|  |  |  | S-w | 1 | Adult female                        | Escaped |     | 58    |
|  |  |  | Cf  | 1 | Juvenile                            | -       | -   | 58    |
|  |  |  | Pn  | 1 | Adult female                        | -       | -   | 59    |
|  |  |  | Cf  | 1 | Juvenile                            | -       | -   | 60    |
|  |  |  | S-w | 1 | Adult female                        | 140     | 160 | 66    |
|  |  |  | S-w | 1 | Juvenile                            | 90      | 110 | 81    |
|  |  |  | S-w | 1 | Sub-adult                           | 120     | 150 | 83    |
|  |  |  | S-w | 1 | Juvenile                            | 80      | 90  | 83    |
|  |  |  | S-w | 1 | Adult female                        | Escaped |     | 83    |
|  |  |  | S-w | 1 | Adult female                        | 115     | 140 | 87    |
|  |  |  | S-w | 1 | Juvenile                            | Escaped |     | 87    |
|  |  |  | S-w | 1 | Juvenile                            | 55      | 60  | 93    |

## 5 ***INTERPRETATION AND EVALUATION***

### 5.1 ***Constraints***

Establishing population size is difficult for reptiles without substantial effort (20+ visits). In this case, a precise estimate of population size was not required for impact assessment and mitigation planning. However, the surveys give a crude assessment of the population size for mitigation purposes.

Based on the survey results (and available suitable habitat) a medium population of slow-worms is present. The total number of slow-worms recorded assumes that those that escaped were separate individuals that were only caught once. This is unlikely to be the case.

### 5.2 ***Conclusion***

Habitat within the site (c.3073m<sup>2</sup>) is suitable for slow-worms and artificial refugia surveys showed a medium population of them to be present on site, although at 92 they are only just within this size class (over 100 makes it a large population).

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**TRANSLOCATION SCHEME****6.1 The need for *in situ* translocation**

All UK reptile species are legally protected against killing or injury by the *Wildlife and Countryside Act 1981* and *The Countryside and Rights of Way Act 2000*. Where development may cause harm to reptiles it is therefore common practice to remove them to safety – an exercise called ‘translocation’. As with reptile surveys, it is necessary to carry out translocations at times of year when reptiles are active, *i.e.* between March/ April and September.

**6.2 Overview of the translocation scheme**

To allow the site to be cleared for development without harm to reptiles (so as to comply with the law), a plan to translocate the reptiles has been developed. The strategy follows slightly modified best practice guidelines issued by the former Herpetofauna Groups of Britain and Ireland (HGBI) in 1998 (as mentioned in Natural England’s *Standing Advice for Protected Species: Reptiles* (2011)) in anticipation of the forthcoming *Reptile Mitigation Guidelines* (Natural England, in prep).

The translocation scheme will comprise the following elements:

- habitat enhancement of the receptor site;
- capture of slow-worms using artificial refugia and transfer to the receptor site; and
- vegetation clearance and topsoil stripping immediately after the termination of translocation (to render cleared areas unsuitable for reptiles).

On the basis of data obtained from site, an *in situ* translocation scheme suitable for a medium population of slow-worms has been designed. However, there is always some uncertainty about the size of a population and therefore in the event that a larger population is found (>200) an area on the opposite side of Hermitage Stream will be used as a spillover receptor site or an *ex situ* translocation scheme will be considered.

The scheme will involve the removal of captured reptiles to an area of suitable habitat approximately 1940m<sup>2</sup> on the east side of the site, adjacent to Hermitage Stream – the receptor site (see *Figure 5* in *Section 10*). This area will be enhanced for reptiles by allowing the grass to grow up. This will result in a denser vegetation and grass-litter with greater cover and foraging potential. In addition, several log piles will be added to provide refuge and hibernacula.

The receptor site will remain undeveloped and will be managed sympathetically for reptiles (*i.e.* management of scrub encroachment) to ensure a sustainable population.

The receptor site and the north and south-west edge of the development site (where slow-worms were recorded) will be temporarily fenced with reptile-proof fencing for the duration of the construction phase (see *Figure 7* in *Section 10* for example specification of the fencing). The

reptile fencing will prevent them returning to the area of works and prevent any that may be present in adjacent gardens from entering the site. Only once all development works have finished will the fencing be removed. The location of the receptor site is shown in *Figure 5* in *Section 10*.

The total area of suitable reptile habitat is currently c. 3073m<sup>2</sup>. The area of suitable reptile habitat within the receptor site is c.1940m<sup>2</sup>. Therefore, a total of c.1133m<sup>2</sup> suitable habitat will be lost. Although the amount of habitat used as a receptor site should generally be similar to (or greater than) than that to be lost, a reduction in area may be acceptable since the site will be protected and managed for reptiles into the future.

There is already housing surrounding the site. Therefore, slow-worms will not become more isolated as a result of the development.

### 6.3 *The translocation programme*

#### 6.3.1 *Reptile capture*

The method for capturing reptiles for translocation is similar to that described for reptile surveys, with artificial refugia placed where they will be most likely to be used by reptiles. They will be regularly checked and the slow-worms hand-captured by trained personnel using best-practice handling techniques (Gent & Gibson, 2003). Care will be taken to avoid holding slow-worms behind the vent (which can cause them to shed their tails). Captured slow-worms will be kept for the minimum practicable time in large cloth bags (pillow cases) allowing good ventilation during transport to the receptor site where they will be measured and released.

#### 6.3.2 *Capture effort (inc. capture depletion curves)*

The results of the reptile survey (described in *Section 4.2*.) suggests that there is a medium population of slow-worms. Capture effort is therefore based on the understanding that a medium population of slow-worms need to be translocated.

*Table 6.3.2.1. Guidelines for minimum capture-effort for slow-worms (HGBI 1998).*

| Adult population size (adult density) | Artificial refugia density/ha | Minimum number of trapping days in suitable conditions                                     |
|---------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------|
| High Population (>100/ha)             | 100                           | All suitable days between March and September or a full year (minimum of 90 suitable days) |
| Medium Population (>50/ha)            | 100                           | All suitable days between March and September or a full year (minimum of 70 suitable days) |
| Low Population (<50/ha)               | 50                            | A minimum of 60 suitable days                                                              |

HGBI guidelines (1998) recommend minimum numbers of artificial refugia per unit area (*i.e.* minimum refugia densities) that vary according to the estimated population size. For a medium population, a minimum of 100 refugia per hectare is recommended (*Table 6.3.2.1 above*). A total of 106 artificial refugia were laid out during the survey, which exceeded the minimum required. The high refugia density will speed up the translocation.

Capture efficiency will be maximised by encouraging use of the artificial refugia by making the rest of the site less suitable for slow-worms. Any existing natural refugia will be removed by hand, while rough grassland will be carefully strimmed to c.15cm to reduce the amount of cover. Islands of good habitat will initially be retained and then removed gradually as the slow-worm population diminishes (due to translocation) so that the site will always be able to support the remaining population.

It is possible to continue capturing animals in sub-optimal weather, provided that no conclusions about the number of animals remaining are drawn from a failure to capture animals in such conditions.

Capture depletion curves are sometimes used as a way of judging that most reptiles have been removed. Care is needed in the interpretation of these curves, as reptile activity is seasonal and varies with weather conditions. Rates of capture would be expected to drop in hot summer weather and in autumn and at other times when weather conditions are unfavourable.

### 6.3.3 *Carrying capacity of the receptor site*

Although *in situ* translocations are preferable to *ex situ* translocations for numerous reasons, care must be taken not to overload the existing population. It is preferable for the receptor site not to support slow-worms, however this is not always possible. Relocating more reptiles to an occupied site without any attempt to increase carrying capacity will result in a net loss in local reptile conservation status and is therefore unacceptable.

Although unlikely, if slow-worm capture exceeds 200 (the estimated carrying capacity of the receptor site), then the translocation programme will be postponed until habitat enhancement can be further increased within the receptor site or adjacent areas to allow for a larger population *i.e.* an area on the opposite side of Hermitage Stream will be used as an spillover receptor site (see *Figure 6* in *Section 10*). Alternatively an off-site receptor site may be sought but this would take considerable time to locate and survey, and would require approval from the LPA before translocation could commence.

Translocation off-site should only be only as a last resort. Every effort will be made to maintain/create as much habitat as possible within the receptor site in order to ensure the viability and welfare of the reptile population.

### 6.3.4 *Termination of capture*

Capture can terminate when no reptiles are found in the trapping area on five consecutive suitable-weather days, provided a minimum of 30 suitable trapping days has already taken place. This is lower than the 60 minimum days given in HGBI guidelines (see *Table 6.3.2.1*) but provides an acceptable level of translocation effort providing five clear (reptile-free) days have been achieved and careful interpretation of the capture depletion curve (a curve visible when the data is plotted on a graph) demonstrates the majority of reptiles have been translocated.

## **6.4     *Destructive searching (vegetation clearance and topsoil stripping)***

Works to render habitat unsuitable for reptiles will be carried out upon the termination of capture. The works will be supervised by an ecologist so that no reptiles are harmed; any found will be captured and removed to the receptor site. The works will begin with careful vegetation clearance and end with topsoil stripping under strict ecological supervision, making the area finally unsuitable for reptiles. The programme will therefore comprise the following:

- additional artificial refugia will initially be laid out at high density;
- any remaining natural refugia will be removed by hand;
- a hand search of artificial refugia and vegetation will be carried out immediately before vegetation clearance;
- strimming will be carried out working systematically from one end of the site to the other (all cuttings to be removed from site); and
- topsoil stripping under strict ecological supervision will be undertaken as the final stage. The upper layer (15cm) of topsoil will be stripped by machines using a wide bucket with long tines (to minimise injury to reptiles). Uncovered reptiles can then be captured by hand.

If vegetation clearance/ topsoil stripping cannot be completed in one operation, refugia trapping will continue in the part yet to be cleared.

## **6.5     *Monitoring progress of the translocation***

### **6.5.1     *Data recording***

In addition to date and time, details of environmental conditions and captured individuals will be recorded as follows:

- Weather:
  - air temperature (°C);
  - cloud cover (%); and
  - a general description of conditions including wind (speed/ direction) and incidence of rain.
- Data for each individual:
  - species;
  - sex;
  - age class (adult, sub-adult or juvenile);
  - biometrics (snout to vent and vent to tail measurements, in mm);
  - area where the capture or sighting occurred; and
  - whether translocated or observed without capture.

Furthermore, if practical, digital photographs of chin patterns may be taken so individual animals can subsequently be identified during monitoring visits.

Data for individuals sighted but not captured will also be noted. Adults are taken to be sexually mature individuals (3-4 years old), typically more than 230mm long (Beebee & Griffiths 2000). Juveniles are small individuals born in the season of capture or the previous season. Sub-adults fall between these categories.

## 7 **HABITAT CREATION AND MANAGEMENT**

### 7.1 **Objectives**

It will be necessary to undertake habitat work to make the receptor site suitable for slow-worms prior to the translocation.

Reptiles rely on conditions that allow them to maintain their body temperature (they need to be able to bask and avoid extremes of temperature). Habitats need to provide a structure that allows reptiles to bask or otherwise warm up using the sun's energy, but also to avoid extremes of heat and cold. Reptiles require:

- access to direct sunlight;
- shelter from the elements, such as wind and excessive heat;
- sufficiently large populations of prey species *e.g.* soft-bodied invertebrates for slow-worms;
- cover to avoid predators; and
- suitable hibernation sites.

Densely planted, low-growing vegetation provides shelter, while more open areas (with short vegetation) provide places for reptiles to bask, in easy reach of cover. Various other species of wildlife will also be attracted to the different microhabitats created. Therefore, the receptor site needs to be managed long-term with slow-worms in mind. Management should maintain the following:

- a diverse vegetation structure;
- sunlight at ground level (from open areas within habitats);
- continuity of sufficient and appropriate habitat over time;
- connectivity of areas occupied and used by reptiles;
- features for breeding/egg-laying where appropriate; and
- areas for hibernation.

Management should avoid the following:

- damaging activities that impact adversely on vegetation structure; and
- activities that can cause direct killing or injuring of animals or significant disturbance.

### 7.2 **Recommendations**

#### 7.2.1 *Receptor site*

The receptor site will be an area of suitable habitat approximately 1940m<sup>2</sup> on the east side of the site, adjacent to Hermitage Stream (currently mown grassland). The location of the receptor site is shown in *Figure 5* in *Section 10*. It will be retained and managed sympathetically for reptiles.

Prior to the translocation, the grass will be allowed to grow into a taller sward. This will create

denser vegetation and grass-litter with greater cover and foraging potential.

The grassland in the receptor site will be allowed to grow with minimal intervention. It will only be cut between November and February to minimise harm to reptiles and maximise structural diversity of the grassland vegetation. Also, any scrub and tree cutting should take place between November and February to avoid disturbance of nesting birds.

Mowing or cutting large areas of ground can create habitats that are too uniform. It is important to create a mosaic of plant heights. Alternating strips will be cut on a rotational basis every autumn (two or more sections cut annually). Vegetation can be graded from a height of 35cm to longer uncut areas with brambles or bushes. No two adjacent sections should be cut in the same year to allow reptiles to utilise these areas. The receptor site should be cut using a hand-operated reciprocating cutter, brush-cutter, strimmer or hand scythe.

Low levels of tree cover can benefit reptiles by providing a greater variety of ground temperatures and providing shade on very hot days. Management of trees and scrubby vegetation may be needed to stop the grassland becoming too shaded but shrubs and hedges are also important habitats. Repeated cutting of herbaceous vegetation controls succession to woody (shading) vegetation and diversifies habitat age structures. This will maintain a diverse tussocky structure within the grassland and will prevent encroachment of bramble scrub.

Tree roots may provide hibernation areas but additional hibernacula can be created using log piles. Logs will be placed in dense piles in shaded areas. These can provide excellent daytime refuges and, as well as providing cover from the sun, the dead wood attracts soft-bodied invertebrates (such as slugs) on which slow-worms can feed.

Winter cutting should avoid creating large areas of very short sward vegetation around the tree bases and log piles (*i.e.* hibernation sites), where reptiles need cover on emergence in the spring.

**8.1 General**

The receptor site should:

- not be subject to planning or other threats in the foreseeable future;
- be subject to a written, agreed and funded pre- and post-translocation management agreement through Section 106 or equivalent; and
- be subject to a written, agreed and funded pre- and post-translocation monitoring programme through Section 106 or equivalent.

The receptor site is free of foreseeable threats such as future development. There is thought to be little fire risk or hydrological disruption, although discarded litter could pose a hazard (as well as being unsightly) so this should be collected periodically.

Predation by cats could be a serious problem, especially for small patches of habitat adjacent to houses. Cats can take large numbers of reptiles and threaten population viability. In some circumstances, site managers can speak to householders to ask them to keep their cats in as much as possible, and to discourage them from taking reptiles. It is recognised, though, that there is little hope of restricting cats' behaviour. Consequently, a better approach here is to ensure the site has sufficient refuge habitat, which may render reptiles safer.

**9.1 Overview**

HGBI guidelines (1998) state that at least five years monitoring of the receptor site should be carried out to ensure the strategy is achieving its aims. Appropriate monitoring will record the continued presence of translocated animals and record breeding success. However, this is unlikely to provide meaningful results since it is several years before slow-worms can breed. Consequently, it is recommended that the 5-year monitoring programme is staggered with one monitoring survey every five years for 25 years. However, if this is impractical, the monitoring should be carried out annually for five years as an alternative.

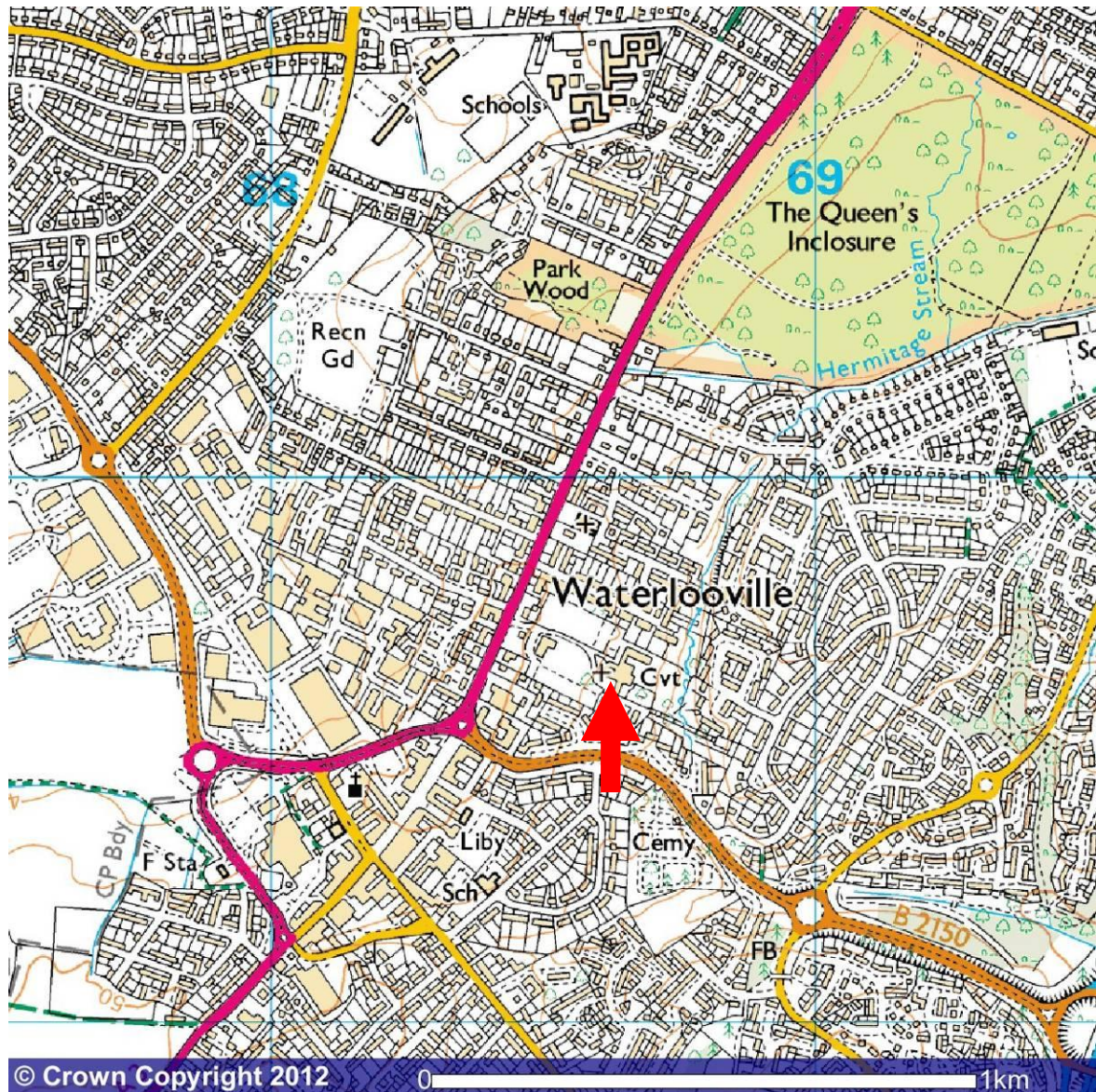
The artificial refugia will be set out and removed after each monitoring season, thus reducing the amount of time they will be on site. This is practical since the leaving artificial refugia visible within the receptor site for any length of time greatly increases the risk of human disturbance.

A site visit to assess and remedy any management problems within the receptor site should be undertaken annually. Summary results of this and the monitoring programme should be made available at the end of each season to the LPA.

Figure 1. Aerial photographs showing the location of the site.



Figure 2. OS Map showing the location of the site.



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Figure 3. Site plan with the extent of the suitable reptile habitat on site (rough grassland).

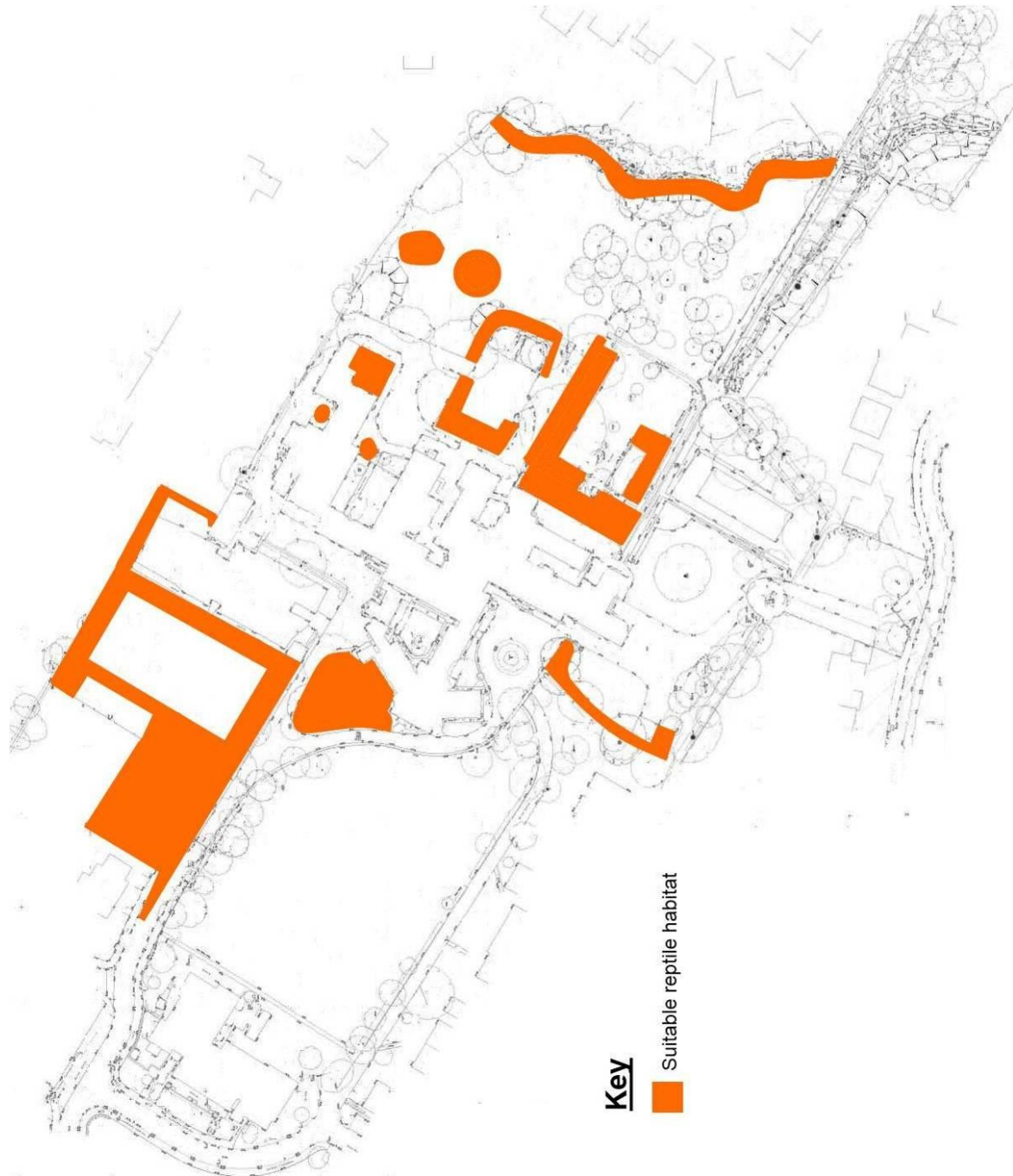


Figure 4. Location of artificial refugia for reptile survey.

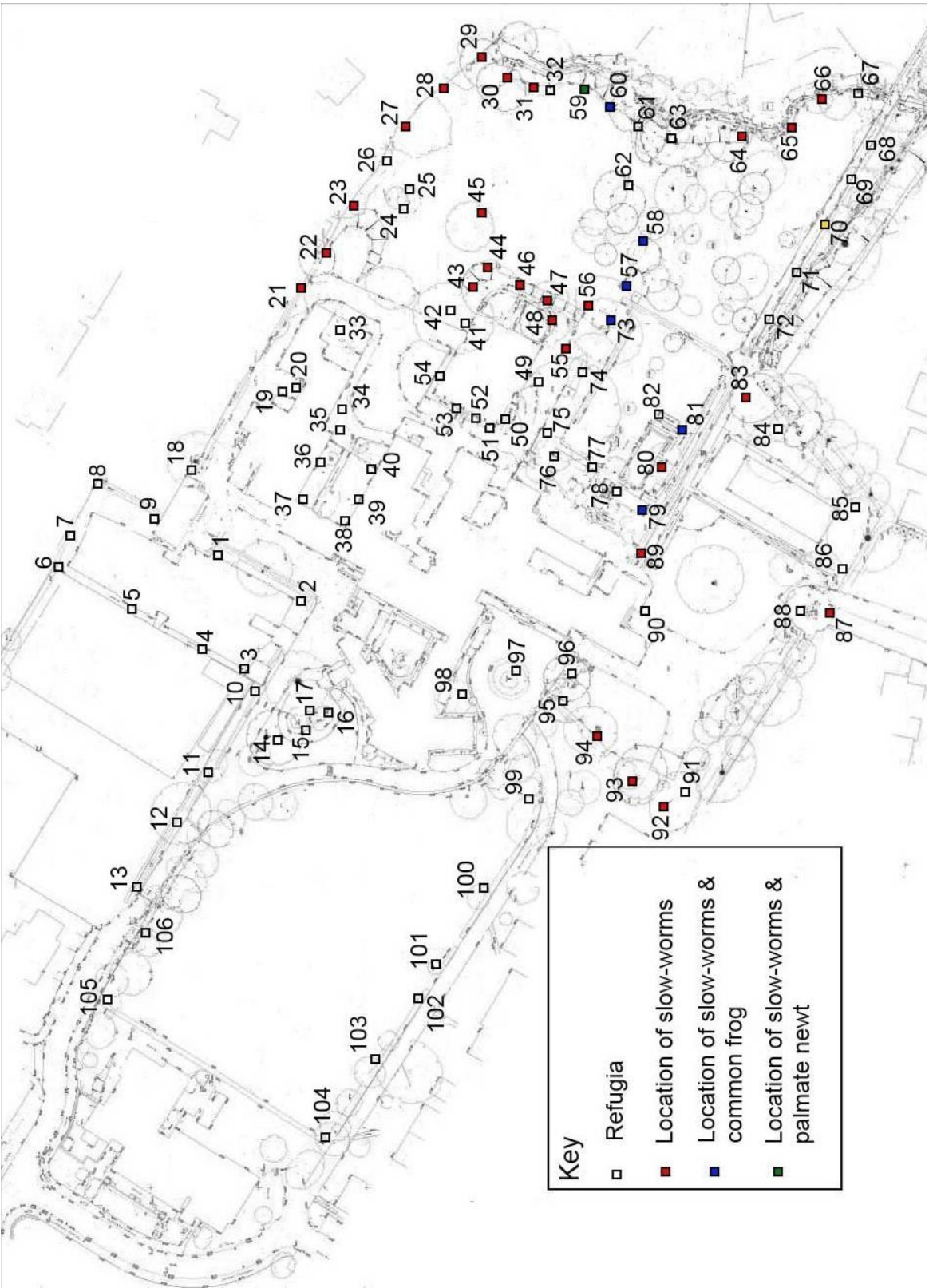


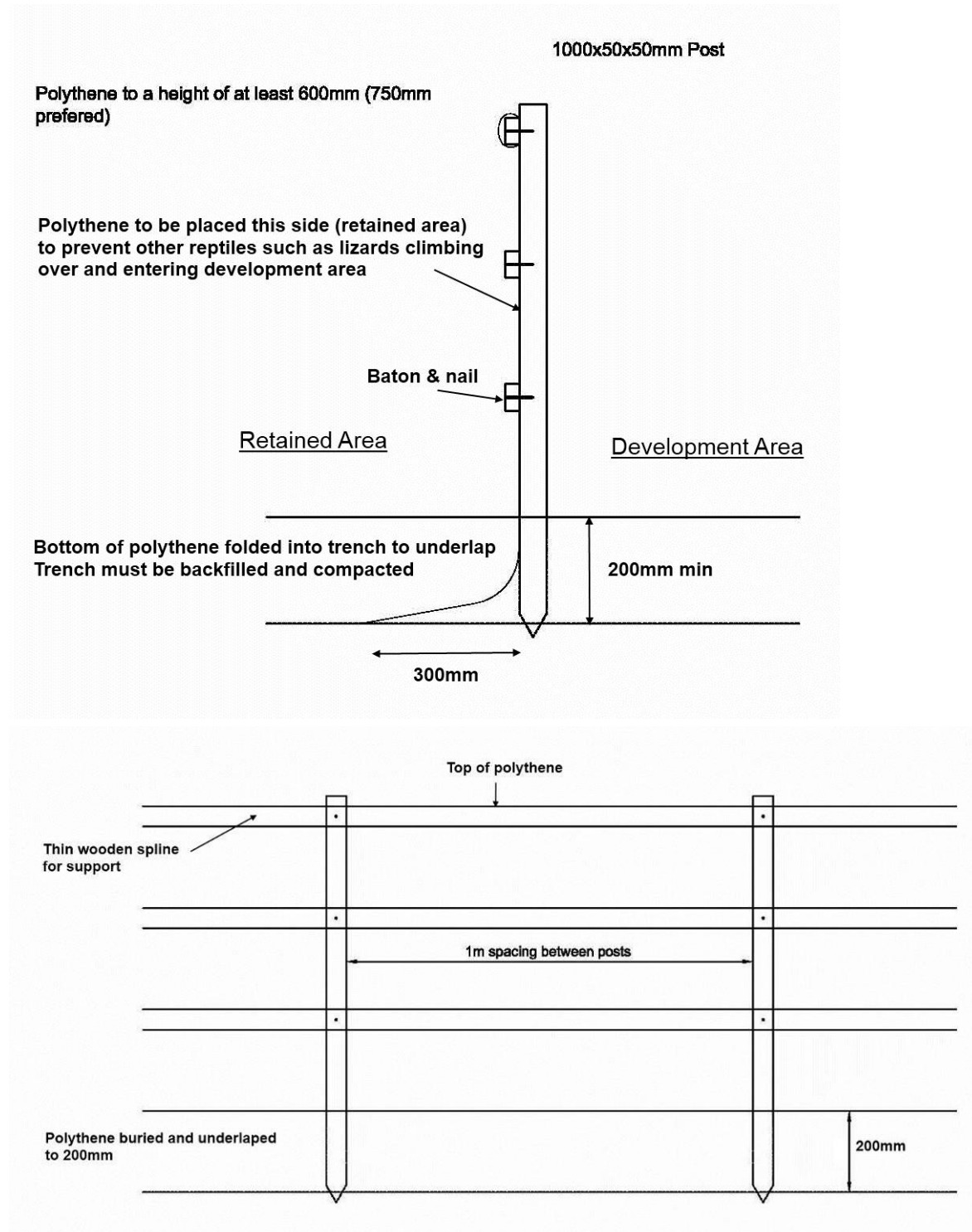


Figure 6. Aerial photo showing the location of the receptor site (red) & spillover site (blue).



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Figure 7. Specifications of reptile exclusion fencing.



## PHOTOGRAPHS

*Photo 1. View looking north from south-east corner of the site (taken 27/3/12).*



*Photo 2. View looking west up the path towards the convent (taken 27/3/12).*



*Photo 3. View of the amenity grassland to the east of the convent (taken 27/3/12).*



*Photo 4. View south showing the orchard in the centre of the grassland (taken 27/3/12).*



*Photo 5. View showing greenhouse and Malus domestica (Apple) trees (taken 27/3/12).*



*Photo 6. Car-park with amenity grassland (taken 27/3/12).*



*Photo 7. View looking north from south-east corner of the site (taken 28/7/12).*



*Photo 8. View looking east showing suitable reptile habitat at edges of site (taken 28/7/12).*



*Photo 9. View south showing the orchard & Hermitage Stream (taken 28/7/12).*



*Photo 10. View south showing the orchard in the centre of the grassland (taken 28/7/12).*



*Photo 11. View looking north with Hermitage Stream to the left (taken 28/7/12).*



*Photo 12. View looking south showing access road and short amenity grassland (taken 28/7/12).*



*Photo 13. View of spillover site looking west (taken 28/7/12).*



*Photo 14. View of spillover site looking west (taken 28/7/12).*



*Photo 15. View of spillover site looking east (taken 28/7/12).*



*Photo 16. View of adjacent cemetery (taken 28/7/12).*



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