
Applegarth Farm, Headley Road, Grayshott, Hampshire, GU26 6JL

Reptile Survey & Mitigation Strategy Report

February 2021

Hampshire Ecological Services Ltd
Consultant Ecologists

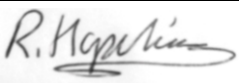

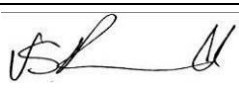

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Reptile Survey & Mitigation Strategy Report
Applegarth Farm, Headley Road, Grayshott, Hampshire, GU26 6JL
for
Mr William Benson

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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.

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EXECUTIVE SUMMARY

1. This report describes reptile surveys and a subsequent mitigation strategy carried out for Mr Benson in connection with a proposal to develop the areas around the farm shop site at Applegarth Farm, Headley Road, Grayshott, Hampshire, GU26 6JL (approximate Ordnance Survey Grid Reference SU858360). The location of the site is shown in *Figures 1 and 2* and a plan showing the location of the suitable habitat is shown in *Figure 3* in *Section 10*.
2. The site was initially assessed as containing habitat suitable for reptiles on the 24th September 2019 by Nicola Pyle MCIEEM and Calum Cooper BSc GradCIEEM of Hampshire Ecological Services Ltd.
3. A previous survey of the adjacent Applegarth Vale development site was carried out by Jonathan Cox Associates between April and June 2014 (Jonathan Cox Associates, 2014) and found a low presence of grass snake (two individuals) and slow-worm (one individual) on the earth bank (driving range bund) on the northern part of the wider site.
4. A total of 82 artificial refugia were laid on the 10th September 2020 in suitable reptile habitat on the development site and left for a settling period of four days. Seven visits to determine presence/ likely absence of reptiles were carried out between the 14th September & 29th September 2020. 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*.
5. The presence of common lizard (*Lacerta vivipara*) within the survey area was confirmed. Based on the survey results, a low population of common lizard are present. As slow-worm and grass snake were recorded in the receptor site during previous surveys of the site in 2014, it is considered likely that these species are still present on the site. In addition, one common frog was recorded on a pre-dawn re-entry bat survey on 28th August 2019. Therefore, the habitat on site is suitable terrestrial habitat for these species.
6. A mitigation strategy (an *in situ* translocation) has been devised prior to site clearance to ensure compliance with the law and planning policy. An *in situ* receptor site is preferable to an *ex situ* receptor site (off-site). The strategy has two main aims:
 - to avoid harm to reptiles; and
 - prevent any net loss of local conservation status.
7. The strategy involves the removal of captured reptiles to the receptor site at the edges of the proposed Eco Pods field north of the farm shop site, prior to works. The location of the receptor site in relation to the development site is shown in *Figure 5* in *Section 10*.
8. The area of suitable reptile habitat on the farm shop site to be affected is *c.3,750m²*. The scheme will involve the removal of captured reptiles to an area of suitable habitat approximately *2,750m²* to the north of the farm shop site (see *Figure 5* in *Section 10*). The

amount of habitat used as a receptor site should generally be similar to (or greater than) that to be lost. However, a reduction in area may be acceptable as the receptor site will be protected and managed for reptiles long-term. Areas of suitable reptile habitat will be allowed to establish around the edges of the site post-development, the area of suitable habitat post development around the farm shop site is anticipated to be approximately c.2,900m² (see *Figure 6 in Section 10*).

9. Prior to the translocation the receptor site will be enhanced by allowing the grassland to grow into a taller sward. This will result in a denser vegetation cover and deep grass litter layer with greater foraging potential. In addition, scrub and brambles will be managed to prevent them encroaching on the grassland. Log piles and compost heaps will be added to the receptor site and the wider farm shop site (after the works) to create refugia. The location of suitable habitat following this enhancement is shown in *Figure 6 in Section 10*.
10. The translocation of the reptiles will commence between March and April, then terminate when no reptiles are found in the search area on five consecutive suitable-weather days, provided a minimum of 15 suitable trapping days has already taken place. A destructive search will then be undertaken under strict ecological supervision.
11. The receptor site will remain undeveloped and will be managed sympathetically for reptiles. The grassland on the receptor site will be allowed to grow with minimal intervention and only be cut only between November and February to minimise harm to reptiles and maximise structural diversity of the grassland vegetation. There will be repeated cutting of any nettled vegetation in the receptor site to allow the grasses to flourish. Also, any scrub and tree cutting should take place between November and February to avoid disturbance of nesting birds. This will prevent the receptor site becoming too shaded to support reptiles, but they are also important habitats and therefore will not be completely removed.
12. Within the open spaces and borders, plants that attract insects are generally helpful and cover for reptiles can be provided by densely planted garden plants. Garden landscaping and greenspace management throughout the development, when done sympathetically, need not conflict with a sustainable reptile population.
13. 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 (at least once a month).
14. If required to support the planning application, 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. A site visit to assess and remedy any management problems within the receptor site should be undertaken annually. Summary results

of this and any monitoring programme should be made available at the end of each season to the LPA.

2 **INTRODUCTION**

2.1 ***Purpose of this report***

This report provides information from reptile surveys carried out by Hampshire Ecological Services Ltd for Mr Will Benson, in connection with a proposal to develop the areas around the farm shop site at Applegarth Farm, Headley Road, Grayshott, Hampshire, GU26 6JL (approximate Ordnance Survey Grid Reference SU858360).

Surveys aimed to:

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

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

2.2 ***Site description***

The site consists of a collection of predominately wooden buildings with the Shop and Barn the largest amongst several smaller sheds. The immediate surroundings are seating areas, a children's play area, a carpark and a storage/yard with areas of rough grassland and bare ground also present.

The site lies on the north-east side of Headley Road, between the villages of Grayshott and Headley Down. The immediate surroundings are the residential properties of a new housing development (Applegarth Vale) to the east; a derelict golf driving range and grassland to the north-west; and Grayshott Health Spa to the south-west. There are extensive areas of woodland in all directions. Ludshott Common SSSI (part of the Wealden Heath Phase II SPA) is to the south-east.

A previous survey of the adjacent Applegarth Vale development site was carried out by Jonathan Cox Associates between April and June 2014 (Jonathan Cox Associates, 2014) and found a low presence of grass snake (two individuals) and slow worm (one individual) on the earth bank (driving range bund) on the northern part of the wider site.

2.3 ***Proposed activities***

This survey was carried out in connection with a proposal to develop the site surrounding the farm shop and barn.

2.4 ***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.

2.5 *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 *Schedule 2* of the *Conservation of Habitats & Species Regulations 2017* 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.

2.6 *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 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 temperature extremes). 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.

2.7 *Structure of this report*

The report is structured as follows:

- *Section 1* contains the executive summary;
- *Section 2* contains an introduction;
- *Section 3* describes the survey methods;
- *Section 4* describes the results;
- *Section 5* evaluates the findings;
- *Section 6* gives details of the proposed translocation scheme;
- *Section 7* gives details of the proposed habitat creation;
- *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 including;
 - *Figure 1* gives aerial photographs showing the site location;
 - *Figure 2* gives an Ordnance Survey map showing the location of the site;
 - *Figure 3* gives a site plan showing the extent of suitable reptile habitat;
 - *Figure 4* shows the location of artificial refugia and the results of the reptile surveys;
 - *Figure 5* gives a location of the receptor site and reptile fence;
 - *Figure 6* gives the extent of the suitable habitat post-development; and
 - *Figure 7* gives the specifications of reptile exclusion fencing.
- *Section 11* provides photos of the sites; and
- *Section 12* provides references.

METHODOLOGY

3.1 General

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

3.2 Dates, times and weather

An initial site survey was carried out during the daytime on the 24th September 2019 which identified suitable reptile habitat to be present on site. The weather conditions during the survey were warm (20°C) and dry with 50% cloud cover and a light breeze (Beaufort scale 1).

Artificial refugia were placed around the development site on the 10th September 2020 in suitable reptile habitat and left for a four-day settling period. Seven visits were then carried out between the 14th & 29th September 2020 to assess the presence or likely absence of reptiles. The weather conditions for each visit are given in *Table 4.2.1* in *Section 4*.

3.3 Personnel

The habitat was assessed by Nicola Pyle MCIEEM who is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). She has over 14 years of experience in ecological consultancy and is a highly competent ecologist trained in Phase 1 Habitat Survey and protected species surveys. She was assisted by Calum Cooper BSc (Hons) GradCIEEM who has over five years of experience in ecological consultancy and is experienced in carrying out preliminary ecological appraisals and surveys for protected species.

The reptile surveys were carried out by Rozel Hopkins MSci (Hons), Andrew Lomas BSc (Hons) MSc and Ellie Welch BSc (Hons) who are all experienced in carrying out reptile surveys and collecting biometric data from captured reptiles.

All staff adhere to the Chartered Institute of Ecology and Environmental Management's (CIEEM) *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 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).

3.5 *Artificial refugia survey*

Standard methods were used, which involved placing 100 x 50cm sheets of heavy-duty roofing felt (artificial refugia) in areas where they were most likely to be used by reptiles (*e.g.* tussocky grassland and along the earth bank) 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 82 pieces of heavy-duty roofing felt were placed around the development site and checked on seven suitable days. The locations of the refugia are shown in *Figure 4* in *Section 10*.

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 *Habitat suitability***

The patches of rough grassland, bare ground and bramble scrub on the site are suitable foraging habitat for widespread reptile species such as slow-worms and grass snake (see *Photos 3 & 4* in *Section 11*). The location of suitable reptile habitat is illustrated in *Figure 3* in *Section 10*.

4.2 *Artificial refugia survey*

A total of one common lizard was recorded within suitable habitat across the survey area. The common lizard was recorded on the south-east corner of the rough grassland field, alongside the earth bank. As a result of these surveys, it was concluded that a low population of common lizards ($\leq 20/\text{ha}$) is present.

The results of the surveys are presented in *Table 4.2.1* and *Figure 4* in *Section 10* gives the location of the artificial refugia (including where reptiles were recorded).

Table 4.2.1. Results of artificial refugia survey

Date	Time	Temp (°C)	Refugia no.	Species	No.	Sex	Age	SV length (mm)	VT length (mm)	General weather
14/09/20	11:25	20.0	-	-	-	-	-	-	-	Very warm, clear and dry with a light air (Beaufort scale 1 - west)
17/09/20	09:50	15.0	17	Cl	1	Female	Adult	Seen only		Warm, clear and dry with a light breeze (Beaufort scale 2 - west)
20/09/20	10:40	18.0	-	-	-	-	-	-	-	Warm and dry with 50% cloud cover and a light air (Beaufort scale 1)
21/09/20	10:10	15.0	-	-	-	-	-	-	-	Cool and dry with 33% cloud cover and light air (Beaufort scale 1- north-west).
27/09/20	14:35	14.0	-	-	-	-	-	-	-	Mild, overcast and dry with a moderate breeze (Beaufort scale 4)
28/09/20	14:05	17.0	-	-	-	-	-	-	-	Warm, clear and dry with a gentle breeze (Beaufort scale 3)
29/09/20	14:25	17.0	-	-	-	-	-	-	-	Warm, clear and dry with a light air (Beaufort scale 1)

Cl = Common lizard

5.1 Constraints

5.1.1 Constraints on survey data

The surveys were closely spaced and carried out late in the season. Therefore, some individuals may have already gone into deeper cover or hibernation and, with a low population, this would make them difficult to detect.

During one of the survey visits, maintenance staff were observed strimming part of the suitable reptile habitat in the survey area. Artificial refugia were disturbed but replaced in the same location. Further strimming activity was discouraged, but with advice that care be given to preventing harm to reptiles. In addition a staff member on site reported that local children had been observed inspecting some of the artificial refugia, this may have impacted the survey due to disturbance of reptiles.

Habitat within the site is suitable for widespread species of reptiles and artificial refugia surveys showed common lizard to be present on site. 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.

5.1.2 Constraints on the mitigation, compensation and enhancement measures

The reptile translocation area and compensation options under the current plans are subject to the confirmed location and shape of the new layout.

5.2 Conclusion

Habitat within the development site (c.3,750m²) is suitable for widespread reptile species. This includes the field of rough grassland, patches of bramble scrub and log piles. Artificial refugia surveys showed a low population of common lizard to be present.

Based on the survey results (and available suitable habitat) a low population of common lizard is present. The total number of common lizards recorded was one. However, refugia surveys generally always give an underestimate of numbers and only indicate approximate population size class.

As slow worm and grass snake were recorded in the receptor site during previous surveys of the site in 2014, it is considered likely that these species may be present on the site (although not recorded during this survey). These were in low numbers, therefore, as a precautionary measure, the translocation and mitigation will include the possibility of low populations of these species being present on site.

6 **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 areas of 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***

6.2.1 ***General***

To allow the survey area 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 revised *Reptile Mitigation Guidelines* (Natural England, in prep, withdrawn 2011).

The translocation scheme will comprise the following elements:

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

6.2.2 ***In situ translocation***

On the basis of data obtained from site, an *in situ* translocation scheme suitable for a low population of common lizards has been designed. However, there is always some uncertainty about the size of a population and therefore in the event that larger populations are found (>20) the translocation scheme will be reassessed if necessary. As slow worm and grass snake were recorded in the receptor site during previous surveys, as a precautionary measure, the translocation and mitigation will include the possibility of low populations of these species being present on site.

The scheme will involve the removal of captured reptiles to an area of suitable habitat, approximately c.2,750m², around the field to the north of the development site (see *Figure 5* in *Section 10*). The receptor site will remain undeveloped and will be enhanced and managed sympathetically for reptiles to ensure a sustainable population.

The grassland will be allowed to grow into a taller sward, providing a denser vegetation cover and deep grass litter layer with greater foraging potential. In addition, scrub and brambles will be managed to prevent them encroaching on the grassland. This will prevent the receptor site

becoming too shaded to support reptiles, but they are also important habitats and therefore will not be completely removed. Log piles will be added to the receptor site and on the wider site to provide refugia (see *Figure 6* in *Section 10*).

The development footprint will be temporarily fenced, to separate it from the receptor site, with reptile-proof fencing for the duration of the construction phase/clearance works (see *Figures 5 & 7* in *Section 10*). The reptile fencing will prevent any reptiles (or amphibians) in adjacent habitat colonising the site. Only once all development works have finished will the fencing be removed.

The area of suitable reptile habitat to be affected on the farm shop site is *c.*3,750m². The total area of suitable reptile habitat post-development in the farm shop site (including; woodland and grassland) will be approximately 2,900m² (see *Figure 6* in *Section 10*). The receptor site is approximately 2,750m² and will be enhanced, protected and managed for reptiles long-term.

The receptor site links to hedges mature tree-lines and woodland, thereby into the wider countryside. Therefore, the reptiles will not become isolated as a result of the translocation.

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 most likely be used by reptiles. They will be regularly checked and the reptiles 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 reptiles 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*

The results of the reptile survey (described in *Section 4.2*) suggest that there is a low population of common lizards and a possibility of low populations of slow worms and grass snakes. Capture effort is therefore based on the understanding that these populations need to be translocated.

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 (see *Table 6.3.2.1*). A total of 82 artificial refugia were laid out during the survey, therefore this should be sufficient for the translocation.

Table 6.3.2.1. Guidelines for minimum capture-effort for common reptile projects (HGBI 1998).

Species	Adult population size (adult density)	Artificial refugia density/ha	Minimum number of trapping days in good weather
Common lizard	High population (>80 / ha)	100	All suitable days between March & September or a full year (min. 90 suitable days)
	Medium population (> 40 / ha)	100	All suitable days between March & September or a full year (min. 70 suitable days)
	Low population (< 20 / ha)	50	60 suitable days
Slow-worm	High population (> 100 / ha)	100	All suitable days between March & September or a full year (min. 90 suitable days)
	Medium population (> 50 / ha)	100	All suitable days between March & September or a full year (min. 70 suitable days)
	Low population (< 50 / ha)	50	60 suitable days
Grass snake	High population (> 4 / ha)	100	All suitable days between March & September or for two years (min. 90 suitable days)
	Medium population (2 - 4 / ha)	100	All suitable days between March & September or for two years (min. 70 suitable days)
	Low population (< 2 / ha)	50	60 suitable days

Capture efficiency will be maximised by encouraging use of the artificial refugia by making the rest of the site less suitable for reptiles. Any existing natural refugia will be removed by hand, while rough grassland and tall herb vegetation 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 populations of reptiles 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*

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.

Translocation off-site should only be carried out 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.

Although unlikely, if common lizard capture exceeds 20 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. If captures of slow worm and grass snake occur then the translocation and enhancement scheme will be reviewed for its viability.

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 15 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.

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 to reduce the risk that 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:

- 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 (slow-worm or common lizard) 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.

7 **HABITAT CREATION AND MANAGEMENT**

7.1 **Objectives**

As the development works will result in the majority of the existing suitable habitat on the site being lost it will be necessary to undertake habitat work to enhance the receptor site suitable for common lizards and other reptiles prior to the translocation.

Reptiles rely on conditions that allow them to maintain their body 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.

Dense, 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 reptiles 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 *Overview*

The receptor site is an area of suitable grassland and earth bank habitat approximately *c.*2,750m² to the north of the main farm shop site. The location of the receptor site in relation to the development site is shown in *Figure 5* in *Section 10*. This area will be retained and managed sympathetically for reptiles.

In addition, following construction, the site will be landscaped to include the following enhancements for reptiles:

- refugia will be created in the around the farm shop site and the receptor site in the form of log piles and compost heaps (see *Figure 6* in *Section 10*);
- gaps under any new boundary fences to allow reptiles to access any suitable habitat on the whole site;

7.2.2 Receptor site

The receptor site is an area of suitable habitat to the north of the farm shop site, within the wider ownership (see *Figure 5* in *Section 10*). The receptor site will be will be retained, enhanced and managed sympathetically for reptiles long-term.

At the time of the survey the grassland on site had a tall tussocky sward with moderate suitability for reptiles such as slow-worms and grass snake, particularly at the edges and on the earth bank. However, further information on the management of the field revealed that the grassland is usually short due to horse-grazing and the production of silage (see aerial photos in *Figure 1*, dated 2018). As such, the grassland is unlikely to support a large population of reptiles (if any). The vegetation on the earth bank however still provides suitable habitat for widespread reptile species.

The grassland on the receptor site will be allowed to grow with minimal intervention and only be cut only between November and February to minimise harm to reptiles and maximise structural diversity of the grassland vegetation. There will be repeated cutting of any nettled vegetation in the receptor site to allow the grasses to flourish. 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 c.35cm to longer uncut areas with brambles. 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 hedges and scrubby vegetation may be needed to stop the grassland becoming too shaded but these are also important habitats. Repeated cutting of herbaceous vegetation controls succession to woody (shading) vegetation and diversifies habitat age structures. This will maintain the diverse tussocky structure of the rough grassland and will prevent encroachment of bramble scrub.

Tree roots may provide hibernation areas but additional hibernacula will be created using log piles. Logs piles will be placed in dense piles in shaded areas (see *Figure 6* in *Section 10*). 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 reptile and amphibians can feed.

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

7.2.3 *Habitat creation and enhancement*

Refugia creation

Hibernacula will be created using log piles. Logs will be placed in dense piles in shaded areas such as beneath boundary hedges and mature trees. Logs 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 reptiles and amphibians can feed.

The location of the log and turf piles to be placed in the receptor site and around the farm shop site is shown in *Figure 6* in *Section 10*. In total, eight log piles will be created.

Greenspace habitat creation and management

Within the open spaces and borders, plants that attract insects are generally helpful and cover for reptiles can be provided by densely planted garden plants. Garden landscaping and greenspace management throughout the development, when done sympathetically, need not conflict with a sustainable reptile population.

Creation of compost heaps

In order to supplement the habitat within the receptor site and the farm shop site, it is suggested that at least four compost heaps should be created around the site (see *Figure 6* in *Section 10*). These should be based on a traditional square design with wooden slats fixed to upright posts. The compost heaps should be paired and connected to one another to allow reptiles to move between the heaps without breaking cover if one heap is disturbed. Gaps underneath the compost heap (so it is not completely sealed) will allow reptiles to get in and out.

Piles of old grass or leaves also work well (the larger the heap the better). Placed in a sunny, south-facing position, compost heaps make excellent habitats for slow-worms. They are often found buried within them, feeding on the numerous slugs and ants found there.

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.

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 (at least once a month).

9 **MONITORING**

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.

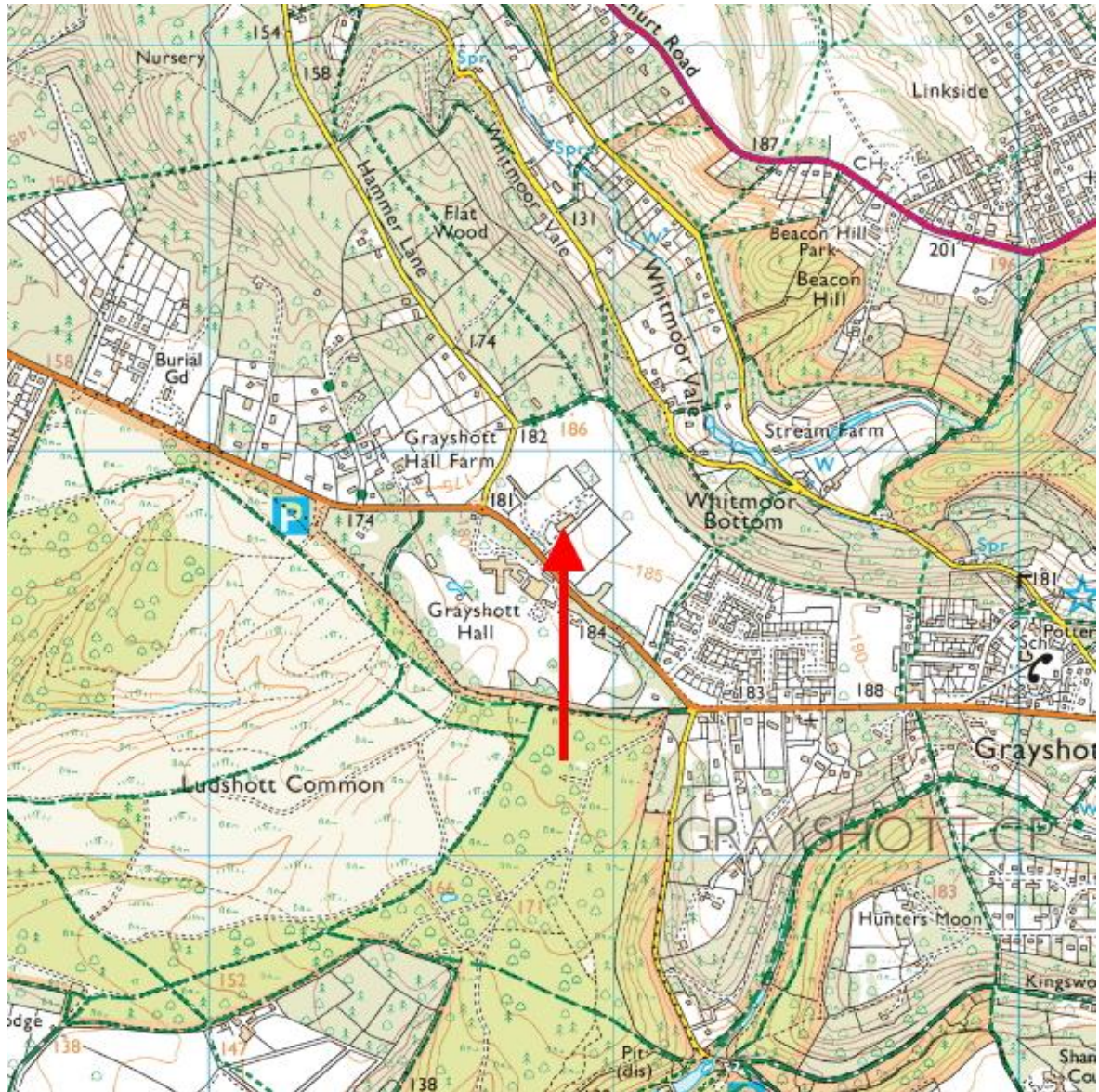
The artificial refugia will be set out and removed after each monitoring season, thus reducing the amount of time they will be on site. This is practical since the leaving artificial refugia visible within the receptor site for any length of time greatly increases the risk of human disturbance.

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 site management/ownership and LPA.

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



Figure 2. An Ordnance Survey map showing the location of the site, as indicated by the red arrow.



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Figure 3. Site plan showing the extent of suitable reptile habitat on the site.

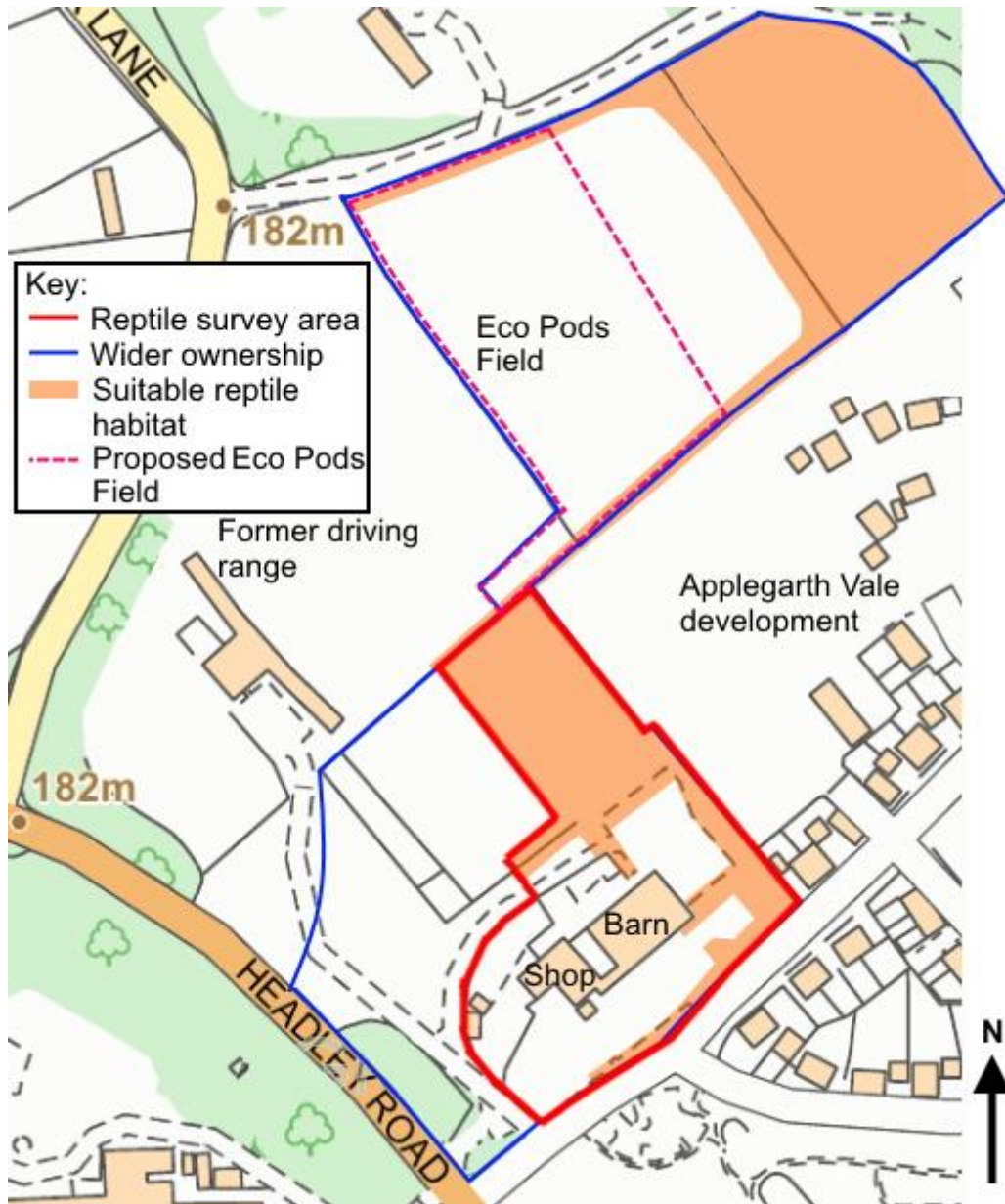


Figure 4. Location of artificial refugia for reptile survey (refugia with recorded reptiles highlighted).

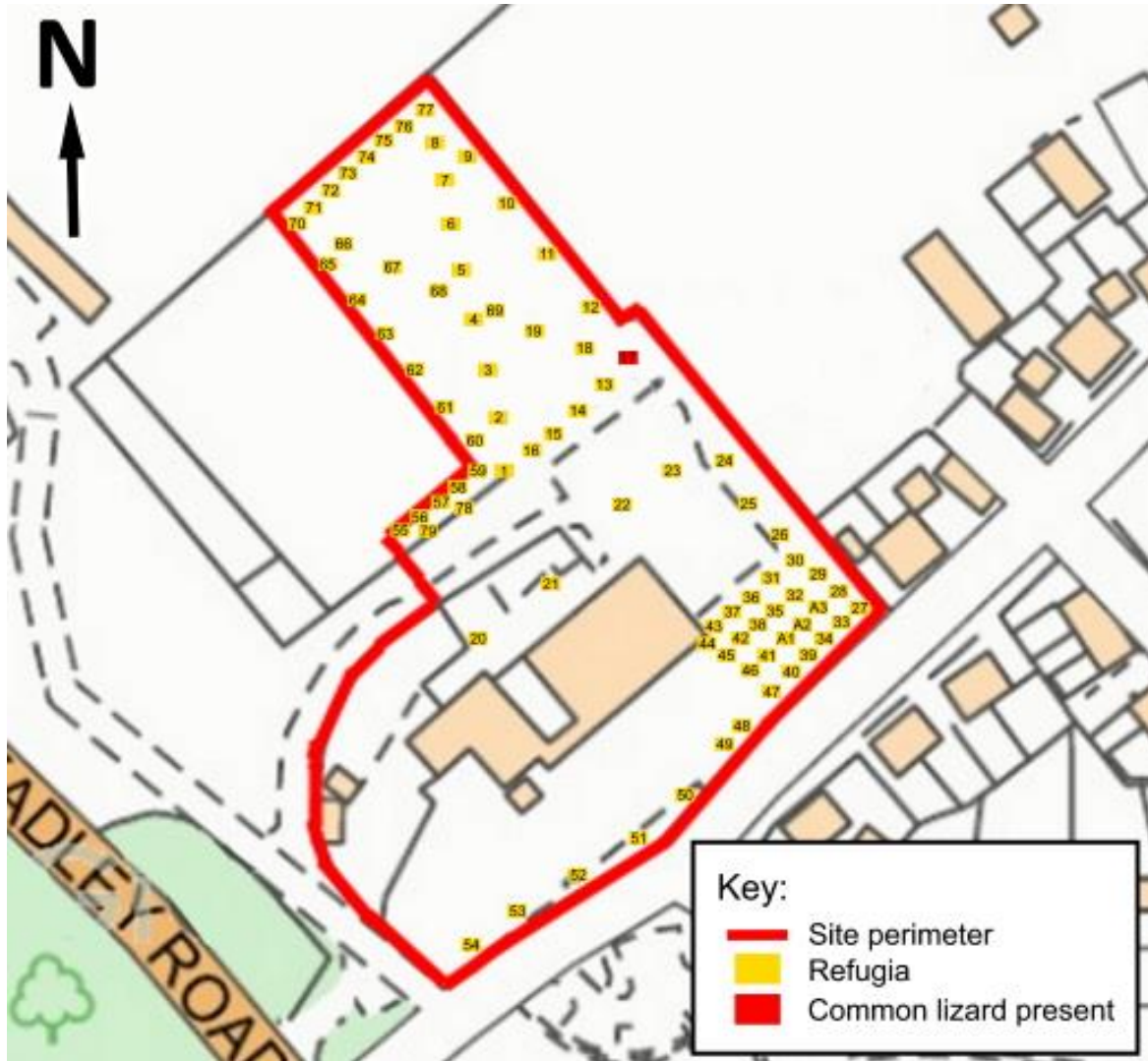


Figure 5. Location of the receptor site in relation to the development footprint, and reptile fence.

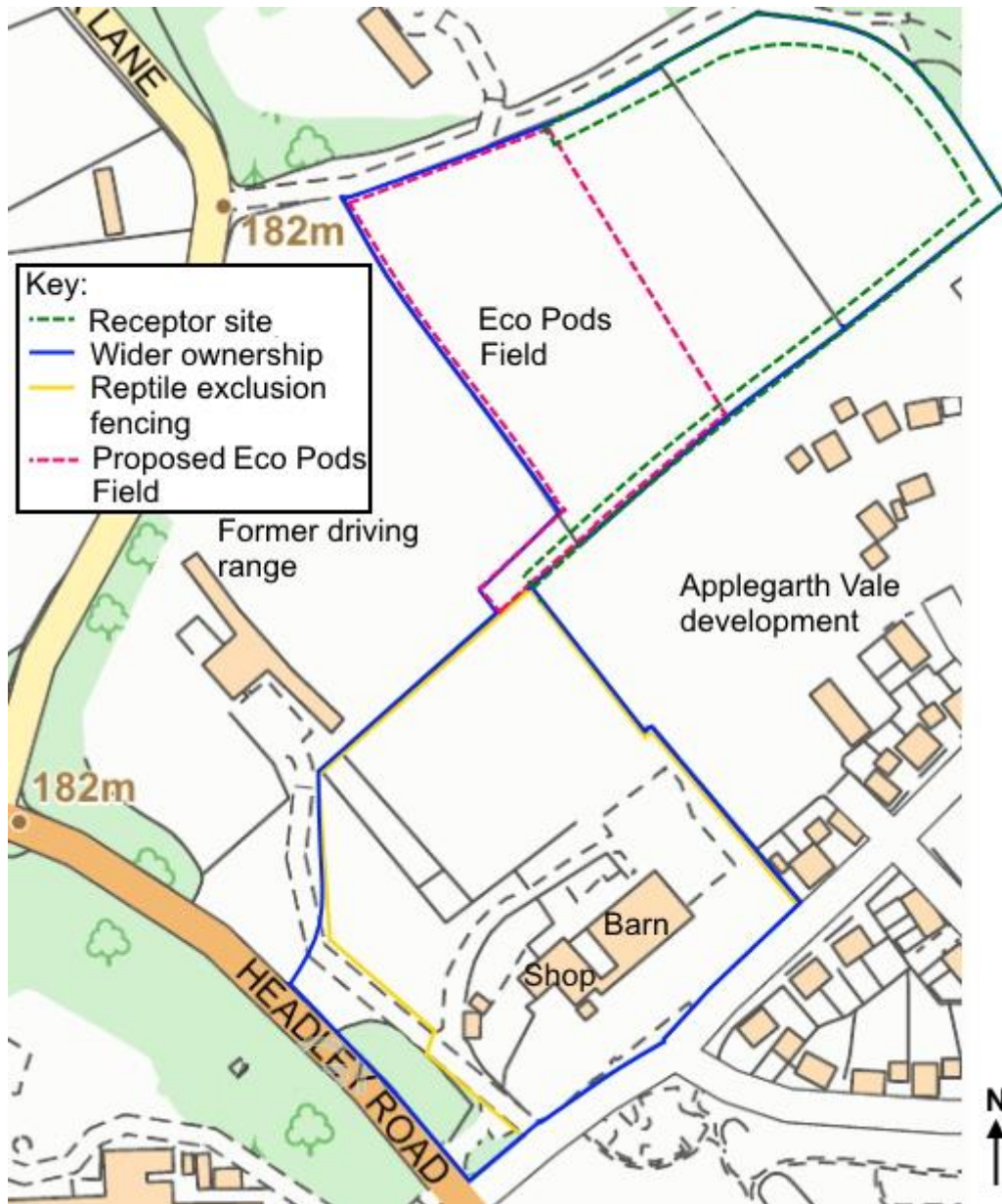


Figure 6. Proposed site layout showing the extent of the suitable reptile habitat post-development, the location of log piles and compost heaps.

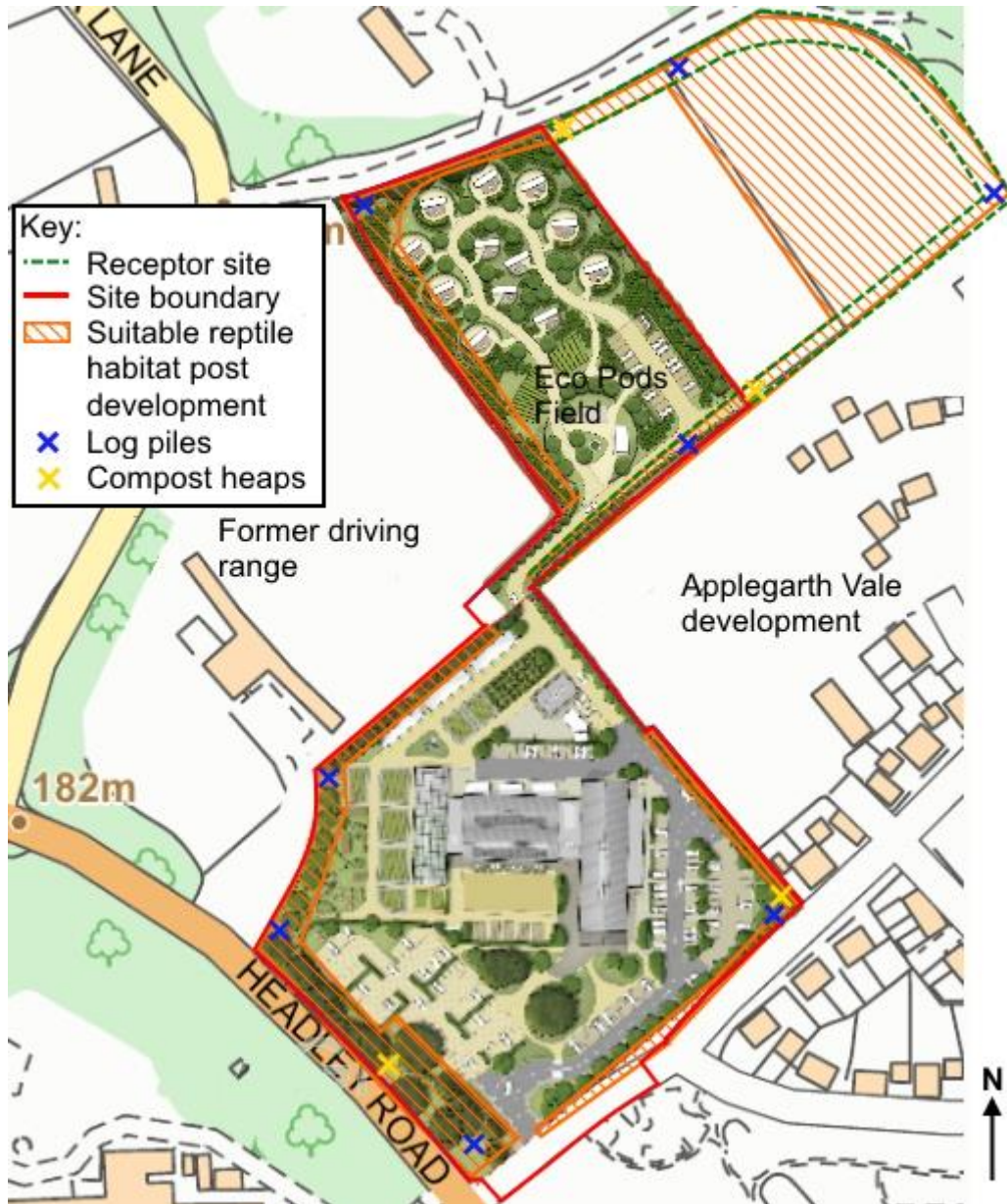
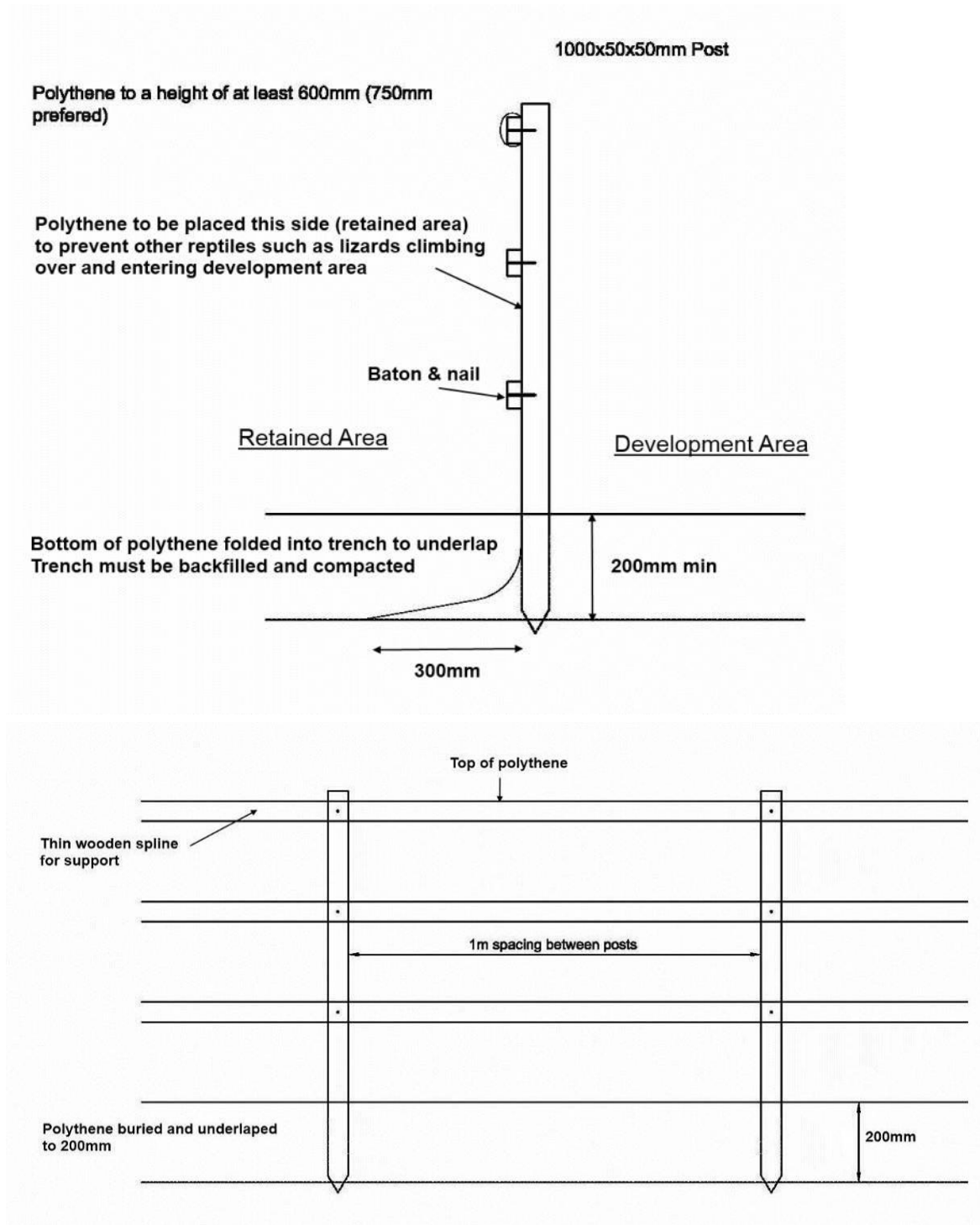


Figure 7. Specifications of reptile exclusion fencing.



PHOTOGRAPHS

Photo 1. A common frog recorded on the decking during a bat pre-dawn re-entry survey (taken 28/08/19).



Photo 2. Example of artificial refugia set out on site for the survey (taken 14/09/20).



Photo 3. Example of existing suitable reptile habitat on the site, and an incidence of maintenance strimming (taken 14/09/20).



Photo 4. Example of suitable reptile habitat on the receptor site (taken 24/09/19).



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