

90 Rose Green Road, Bognor Regis, West Sussex, PO21 3EH

Reptile Translocation Report

July 2017

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Reptile Translocation Report

90 Rose Green Road, Bognor Regis, West Sussex, PO21 3EH

for

Wilson Designer Homes Ltd

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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 a reptile translocation carried out by Hampshire Ecological Services Ltd for Wilson Designer Homes Ltd in connection with a proposal to build new dwellings at 90 Rose Green Road, Bognor Regis, West Sussex, PO21 3EH (approximate Ordnance Survey Grid Reference SZ902993). The location of the site is shown in *Figures 1 and 2 in Section 6*.
2. The purpose of the report is to confirm the following condition has been met: “17. *The development must be carried out in full accordance with the submitted Ecological Mitigation & Enhancement Statement dated 12 January 2016*” in accordance with Arun District Local Plan policy GEN29 and the National Planning Policy Framework.
3. The location of the suitable habitat on the site is shown in *Figure 3 in Section 6*. Because reptiles are legally protected from harm (killing or injury) and would be directly impacted by the development works a translocation programme and destructive search for reptiles was necessary to minimise the risk of reptiles being harmed prior to the development.
4. A total of 40 artificial refugia were laid out in early April 2017 in suitable reptile habitat and left for a settling period of over 1 week. A total of 44 visits were carried out between the 18th April and the 10th July 2017 to capture and translocate reptiles to the receptor site. The translocation continued until no reptiles were found in the vicinity of the buildings to be demolished for five consecutive suitable-weather visits. The raw data is given in *Tables 4.2.1 and 4.2.2. in Section 4*.
5. A total of 29 slow-worms were captured within suitable habitat across the site and translocated to the *in-situ* receptor area. This included 4 juveniles, 9 sub-adults, 15 adults (8 adult males and 7 adult females) and 2 of unknown age. In addition, 4 adult slow-worms and 2 juveniles were seen but not captured. The maximum number of slow-worms captured in a single visit was 7. *Table 4.2.1. shows the results of the translocation*. This was the maximum carrying capacity for this receptor area.
6. A total of 96 slow-worms were captured within suitable habitat across the site and translocated to a larger *in-situ* receptor site which adjoined suitable habitat in the wider landscape (and also connected to the original receptor area by a planted hedge. This included 18 juveniles, 30 sub-adults, 48 adults (21 adult males and 27 adult females). In addition, 7 adult slow-worms, 5 sub-adults and 13 juveniles were seen but not captured. The maximum number of slow-worms captured in a single visit was 11. *Table 4.2.2. shows the results of the translocation*.
7. Following translocation, a destructive search of the site for reptiles, involving vegetation clearance and topsoil stripping, was carried out between the 3rd and 11th July 2017 under strict ecological supervision.
8. All data will be supplied to the Sussex Biological Records Centre (SxBRC).

INTRODUCTION

2.1 Purpose of this report

This report describes a reptile translocation carried out by Hampshire Ecological Services Ltd for Wilson Designer Homes Ltd in connection with a proposal to build new dwellings at 90 Rose Green Road, Bognor Regis, West Sussex, PO21 3EH (approximate Ordnance Survey Grid Reference SZ902993). The location of the site is shown in *Figures 1 and 2* in *Section 6*.

The translocation aimed to capture and translocate the reptiles to a fenced receptor zone on site. This is to comply with the Arun District Council discharge condition 17.

“17. The development must be carried out in full accordance with the submitted Ecological Mitigation & Enhancement Statement dated 12 January 2016.

Reason: In accordance with Arun District Local Plan policy GEN29 and the National Planning Policy Framework”.

2.2 Site description

The site comprises several derelict buildings; including a bungalow, barn and workshop along with other outbuildings. The rest of the site consists of waste ground with piles of refuse and dense nettled vegetation. It is enclosed by residential properties and their gardens on the east, south and west boundaries and by an arable field to the north. Access is via a narrow driveway off Rose Green Road.

The site lies on the north side of Rose Green Road, which is on the north-eastern edge of the town of Bognor Regis. The site is surrounded on the east and south by housing and numerous large arable fields to the north and west. In the wider landscape, the English Channel is c.1.5km to the south-east and the city of Chichester is to the north-west.

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.

A previous survey and report revealed the presence of slow-worms (*Anguis fragilis*) on the site that would be directly impacted by the development works (New Forest Ecological Consultants, 2016).

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 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.

2.7 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 was 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 comprises the following elements:

- 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).

The ecological surveys and report of the site carried out by New Forest Ecological Consultants (2016) states “A total of 28 sightings of Slow Worms was recorded during the five visits, representing a minimum number of 14 animals”. On this basis, an *in situ* translocation scheme was proposed for a low population of slow-worms.

The receptor area, proposed by the previous report, was created in April 2017, approximately c.3m wide x c.35m long, situated along the north-western boundary of the site. Due to the nature of the existing vegetation new topsoil was put into the receptor site and this was laid with turf. In addition, log and turf piles were added.

2.8 *Structure of this report*

- This report is structured as follows:
- *Section 1* contains the executive summary;
- *Section 2* contains an introduction;
- *Section 3* describes the methodology;
- *Section 4* describes the results;
- *Section 5* gives evaluation and interpretation;
- *Section 6* 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; and
 - *Figure 4* shows the location of artificial refugia for the reptile translocation.
- *Section 7* provides photographs of the sites; and
- *Section 8* provides references.

METHODOLOGY

3.1 General

Before any works on the site could begin, a translocation programme followed by a destructive search for reptiles was necessary to minimise the risk of reptiles being harmed prior to the development.

3.2 Date(s), times and weather

A site visit was carried out on the 10th March 2017 to confirm the site was still suitable for reptiles and to discuss the reptile mitigation strategy with the client.

40 artificial refugia were set out in early April 2017 by representatives of the client, covering the site in accordance with a plan of the suitable reptile habitat (see *Figure 3* in *Section 6*).

A total of 44 visits were carried out for the purpose of capturing and translocating the reptiles. These were carried out between the 18th April and the 11th July 2017. The weather conditions for each visit are given in *Tables 4.2.1* and *4.2.2*, in *Section 4*. Five days of no reptile captures in suitable weather conditions followed this.

A destructive search for reptiles was carried out between the 3rd and 11th July 2017.

3.3 Personnel

The site visit to confirm the site was suitable for reptiles and to discuss the reptile mitigation strategy with the client was carried out by John Poland CEnv MCIEEM CBiol MRSB, he was accompanied by Carmen Green BSc (Hons) GradCIEEM.

The artificial refugia were set out by representatives of the client. The reptile translocation was carried out by Carmen Green BSc GradCIEEM, Calum Cooper BSc (Hons), Frances Mullany MSci (Hons), Owen Middleton MEd (Hons) and Fiona Stevenson BSc (Hons) who are experienced in carrying out reptile surveys, translocations and collecting biometric data.

The destructive search was supervised by Calum Cooper BSc (Hons) and Carmen Green BSc (Hons) GradCIEEM who are experienced in carrying out reptile surveys and translocations.

All staff adhere to the Chartered Institute of Ecology and Environmental Management's *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 ecological surveys (2015) and report of the site carried out by New Forest Ecological Consultants (2016) states “A total of 28 sightings of Slow Worms was recorded during the five visits, representing a minimum number of 14 animals”. The suitability of the site for widespread species of reptile was confirmed by Hampshire Ecological Services Ltd during a site visit on the 10th March 2017.

3.5 *Artificial refugia*

The method used involved placing 1m² sheets of corrugated onduline roofing and 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 37 corrugated onduline roofing sheets and three pieces of heavy-duty roofing felt were placed around the site in early April 2017 and left for a settling period of over 1 week.

3.6 *Capture effort*

The results of the ecological surveys carried out by New Forest Ecological Consultants (2016) suggested that there is a low population of slow-worms. Capture effort was therefore planned on the understanding that a low population of slow-worms need to be translocated over 15 visits.

However, the translocation scheme proposed by New Forest Ecological Consultants (2016) was unfit for the number of reptiles captured in the early stages of the programme. As a result the capture effort period was extended to 25 then subsequently 44 visits.

Table 3.6.1. 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
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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. A total of 40 artificial refugia were laid out during the translocation.

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.

3.7 ***Capture and translocation programme***

The refugia were checked once a day by Hampshire Ecological Services Ltd on suitable days between the 18th April and the 11th July 2017. A total of 44 visits were carried out. The translocation continued until no reptiles were found in the vicinity of the buildings to be demolished for five consecutive suitable-weather days (more than the minimum of 15 suitable trapping days had already taken place). This is lower than the 60 minimum days given in HGBI guidelines (1998) 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.

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.

The slow-worms were hand-captured by trained personnel using best-practice handling techniques (Gent & Gibson, 2003). Care was taken to avoid holding slow-worms behind the vent (which can cause them to shed their tails). Captured slow-worms were kept for the minimum practicable time in large cloth bags (pillow cases) allowing good ventilation during transport to the receptor site. Data was recorded for each individual and the reptiles were immediately released into an area of suitable reptile habitat at the receptor site.

3.7.1 *In-situ capture and translocation*

The scheme proposed by New Forest Ecological Consultants (2016) involved the capture and translocation of reptiles in to the receptor area, c.3m wide x c.35m long, along the north-western boundary of the site. The receptor area was only suitable for a low number of slow-worms to be released.

3.7.2 *Further in-situ capture and translocation*

After eleven visits and 29 reptiles had been translocated, it was decided that, when considering the welfare of the individuals being translocated, the *in-situ* scheme proposed by New Forest Ecological Consultants (2016) was no longer suitable for the number of slow-worms being captured and the size of the receptor area on site.

Therefore, a decision was made Hampshire Ecological Services Ltd in consultation with the applicant to implement a further *in-situ* translocation scheme, moving captured reptiles to a second receptor site with more suitable habitat which adjoined suitable habitat in the wider landscape (and also connected to the original receptor area by a planted hedge. This included 18 juveniles, 30 sub-adults, 48 adults (21 adult males and 27 adult females). In addition, 7 adult slow-worms, 5 sub-adults and 13 juveniles were seen but not captured. The maximum number of slow-worms captured in a single visit was 11. *Table 4.2.2.* shows the results of the translocation.

3.8 *Monitoring progress of the translocation*

3.8.1 *Data recording*

In addition to date and time, details of environmental conditions and captured individuals were 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); and
 - whether translocated or observed without capture.

Data for individuals sighted but not captured were also 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.

3.9 *Destructive searching (vegetation clearance and topsoil stripping)*

Works to render habitat unsuitable for reptiles were carried out once the capture and translocation of reptiles in the vicinity of the buildings to be demolished returned negative results for five consecutive visits. The works were supervised by an ecologist so that no reptiles were harmed; any found were captured and removed to the second receptor site. This took seven days to complete between the 3rd and 11th July 2017. The works involved topsoil stripping under strict ecological

supervision, making the area finally unsuitable for reptiles. The programme comprised the following:

- artificial refugia were initially laid out at high density;
- any remaining natural refugia was removed by hand;
- a hand search of artificial refugia and vegetation was carried out immediately before vegetation clearance;
- topsoil stripping under strict ecological supervision was undertaken as the final stage. The upper layer (15cm) of topsoil was stripped and turned by an excavator using a toothed bucket (to minimise injury to reptiles). Uncovered reptiles could then be captured by hand.

RESULTS

4.1 Suitable habitat

The site is a compound consisting of several derelict buildings, bare waste ground and patches of grass and scrub vegetation, which is suitable habitat for widespread species of reptiles such as slow-worm.

The location of suitable reptile habitat is illustrated in *Figure 3* in *Section 6*.

The proposed *in-situ* receptor area is a fenced area of grassland created in April 2017, situated along the north-western boundary of the site, approximately c.3m wide x c.35m long. The area was enhanced with log and turf piles. However, this receptor area is only suitable for a low number of reptiles.

The second *in-situ* receptor site was similar and also adjoined suitable habitat in the wider landscape (and also connected to the original receptor area by a planted hedge).

The receptor sites will be managed sympathetically for reptiles with the management of the *in-situ* receptor aiming to boost its reptile carrying capacity. The receptor sites are free from future development and considered to be better for maintaining a sustainable population and for the welfare of the reptiles than exceeding the carrying capacity of the original receptor site.

4.2 Capture and translocation programme

A total of 29 slow-worms were captured within suitable habitat across the site and translocated to the *in-situ* receptor area. This included 4 juveniles, 9 sub-adults, 15 adults (8 adult males and 7 adult females) and 2 of unknown age. In addition, 4 adult slow-worms and 2 juveniles were seen but not captured. The maximum number of slow-worms captured in a single visit was 7. *Table 4.2.1.* shows the results of the translocation.

A total of 96 slow-worms were captured within suitable habitat across the site and translocated to a larger *in-situ* receptor site which adjoined suitable habitat in the wider landscape (and also connected to the original receptor area by a planted hedge). This included 18 juveniles, 30 sub-adults, 48 adults (21 adult males and 27 adult females). In addition, 7 adult slow-worms, 5 sub-adults and 13 juveniles were seen but not captured. The maximum number of slow-worms captured in a single visit was 11. *Table 4.2.2.* shows the results of the translocation.

The number of slow-worms captured was far greater than the initial assessment by New Forest Ecological Consultants (2016) of a low population of slow-worms present.

No other reptile species were found to be present. All data will be supplied to the Sussex Biological Records Centre (SxBRC).

Table 4.2.1. Results of the capture under artificial refugia and in-situ translocation.

Date	Time	Temp (°C)	Refugia no.	Species	No.	Sex	Age	SV length (mm)	VT length (mm)	General weather	Surveyor
18/04/17	16:55	13.1	-	-	-	-	-	-	-	Warm and dry with 40% cloud cover and a light breeze (Beaufort scale 2)	CG
19/04/17	12:30	19.9	Adjacent property by members of the public	S-w	2	-	-	Unknown		Warm, dry and clear with a light air (Beaufort scale 1)	CC
				S-w	1	Male	Adult	180	80		
				S-w	1	Female	Adult	180	190		
			30	S-w	2	Male	Adult	Seen only			
20/04/17	11:00	17.5	31	S-w	1	Female	Adult	130	160	Warm and dry with 30% cloud cover and a light breeze (Beaufort scale 2)	CC
21/04/17	09:40	12.7	Receptor	S-w	1	Male	Sub-adult	140	155	Warm, dry and overcast with a light air (Beaufort scale 1)	CG
			30	S-w	1	Male	Adult	170	125		
				S-w	1	Male	Sub-adult	115	145		
			31	S-w	1	Unknown	Juvenile	85	110		
24/04/17	10:45	19.2	40	S-w	1	Female	Sub-adult	145	70	Warm and dry with 70% cloud cover and a light breeze (Beaufort scale 2)	CG
			34	S-w	1	Unknown	Juvenile	90	110		
			3	S-w	1	Female	Adult	140	190		
				S-w	1	Female	Adult	160	60		
			9	S-w	1	Male	Adult	205	55		
			10	S-w	1	Female	Adult	160	200		
			30	S-w	1	Unknown	Juvenile	185	105		

25/04/17	12:30	15.3	31	S-w	1	Male	Adult	160	100	Warm and dry with 60% cloud cover and a gentle breeze (Beaufort scale 3)	CC
				S-w	1	Male	Adult	Seen only			
27/04/17	10:15	12.9	32	S-w	1	Female	Adult	160	140	Warm and dry with 5% cloud cover and a light breeze (Beaufort scale 2)	CC
				S-w	1	Female	Adult	Seen only			
28/04/17	10:10	14.6	30	S-w	1	Female	Sub-adult	140	170	Warm and dry with 80% cloud cover and a gentle breeze (Beaufort scale 3)	CG
02/05/17	11:00	18.4	33	S-w	1	Male	Adult	160	60	Warm, dry and clear with a light air (Beaufort scale 1)	CC & OM
			Receptor	S-w	1	Male	Adult	190	85		
			24	S-w	1	Male	Sub-adult	100	210		
03/05/17	13:45	15.7	35	S-w	1	Female	Sub-adult	180	3	Cool, dry and overcast with a gentle breeze (Beaufort scale 3)	CC
			30	S-w	1	Male	Adult	200	150		
			34	S-w	1	Unknown	Juvenile	Seen only			
			19	S-w	1	Female	Adult	110	190		
					1	Female	Sub-adult	90	110		
			26	S-w	1	Female	Adult	200	60		
			21	S-w	1	Male	Sub-adult	120	160		
04/05/2017	10:15	13.4	30	S-w	2	Unknown	Sub-adult	140	90	Warm, dry and overcast with a gentle breeze (Beaufort scale 3)	CC
						Unknown	Juvenile	Seen only			
			34	S-w	1	Unknown	Juvenile	50	60		

S-w = Slow-worm

Table 4.2.2. Results of the capture under artificial refugia and further in-situ translocation.

Date	Time	Temp (°C)	Refugia no.	Species	No.	Sex	Age	SV length (mm)	VT length (mm)	General weather	Surveyor
05/05/17	17:15	14	27	S-w	1	Male	Adult	180	50	Warm, dry and overcast with a light breeze (Beaufort scale 2)	CC
			27	S-w	1	Female	Adult	170	150		
			3	S-w	1	Male	Adult	180	70		
08/05/17	13:45	16.1	20	S-w	1	Unknown	Juvenile	100	60	Warm and dry with 90% cloud cover and a gentle breeze (Beaufort scale 3)	CG
			30	S-w	1	Male	Adult	170	200		
			31	S-w	1	Female	Adult	160	155		
09/05/17	10:30	14.8	32	S-w	1	Male	Adult	200	100	Warm and dry with 90% cloud cover and a light breeze (Beaufort scale 2)	CC
			3	S-w	1	Unknown	Sub-adult	160	100		
10/05/17	10:10	16.9	15	S-w	1	Male	Adult	165	65	Warm and dry with 10% cloud cover and a light air (Beaufort scale 1)	CG
			14	S-w	1	Male	Adult	185	220		
11/05/17	12:30	18.6	35	S-w	1	Female	Sub-adult	150	150	Warm and overcast with light rain and a light breeze (Beaufort scale 2)	CC
			31	S-w	1	Male	Sub-adult	150	100		
			29	S-w	1	Male	Adult	160	200		
12/05/17	12:35	17.2	37	S-w	1	Female	Adult	150	130	Warm and dry with 60% cloud cover and a moderate breeze (Beaufort scale 4)	CG
			27	S-w	1	Female	Adult	145	100		
			24	S-w	1	Male	Adult	135	150		
				S-w	1	Unknown	Juvenile	95	115		
			14	S-w	1	Female	Sub-adult	Seen Only			
			13	S-w	1	Male	Adult	160	80		
			30	S-w	1	Female	Adult	180	105		
			33	S-w	1	Female	Adult	160	55		

15/05/17	14:30	15.4	14	S-w	1	Unknown	Sub-adult	120	160	Cool, dry and overcast with a light breeze (Beaufort scale 2)	CC
16/05/17	10:35	19.3	26	S-w	1	Male	Adult	170	100	Warm and dry with 60% cloud cover and a gentle breeze (Beaufort scale 3)	CG
			24	S-w	1	Female	Adult	160	185		
			14	S-w	1	Male	Sub-adult	155	175		
			34	Cf	1	Unknown	Adult	Seen only			
			19	S-w	1	Male	Adult	190	195		
			33	S-w	1	Male	Sub-adult	135	170		
18/05/17	12:15	18.2	32	S-w	1	Unknown	Adult	Seen only		Warm and dry and overcast with a light air (Beaufort scale 1)	CC
			3	S-w	1	Female	Sub-adult	120	90		
			13	S-w	1	Male	Adult	220	50		
22/05/17	12:45	22	32	S-w	1	Unknown	Adult	Seen only		Warm, dry and clear with a light air (Beaufort scale 1)	CC
			6	S-w	1	Male	Sub-adult	140	180		
				S-w	1	Male	Adult	170	100		
				S-w	1	Female	Adult	210	120		
			1	S-w	1	Male	Adult	240	100		
			3	S-w	1	Female	Sub-adult	170	190		
			24	S-w	1	Unknown	Juvenile	70	80		
23/05/17	10:40	19.3	40	S-w	1	Female	Sub-adult	125	160	Warm and dry with 70% cloud cover and a light air (Beaufort scale 1)	CG
			19	S-w	1	Male	Sub-adult	160	190		
			26	S-w	1	Unknown	Juvenile	Seen only			
			13	S-w	1	Female	Adult	190	80		
			33	S-w	1	Female	Adult	165	90		
24/05/17	16:00	24.7	13	S-w	1	Female	Adult	165	75	Warm and dry with 20% cloud cover and a light breeze (Beaufort scale 2)	CG
			34	S-w	1	Unknown	Juvenile	Seen only			

			30	S-w	1	Unknown	Juvenile	75	80		
26/05/17	10:15	22.4	32	S-w	1	Male	Sub-adult	150	50	Hot, dry and clear with a gentle breeze (Beaufort scale 3)	CC
			31	S-w	1	Unknown	Unknown	Seen only			
			34	S-w	1	Unknown	Sub-adult	140	50		
				S-w	1	Unknown	Sub-adult	150	60		
			24	S-w	1	Unknown	Juvenile	90	130		
12/06/17	11:45	18.7	40	S-w	2	Unknown	Sub-adult	Seen only		Warm, dry and overcast with a gentle breeze (Beaufort scale 3)	CC
			27	S-w	1	Unknown	Sub-adult	110	130		
			31	S-w	1	Unknown	Juvenile	Seen only			
			30	S-w	1	Female	Sub-adult	120	120		
			19	S-w	1	Female	Adult	Seen only			
			17	S-w	1	Male	Adult	130	120		
				S-w	1	Male	Adult	170	120		
			7	S-w	1	Male	Sub-adult	150	90		
			4	S-w	1	Female	Adult	140	150		
			10	S-w	1	Female	Adult	140	170		
			16	S-w	1	Female	Adult	140	170		
			14	S-w	1	Unknown	Juvenile	Seen only			
			13	S-w	1	Unknown	Juvenile	100	100		
				S-w	1	Unknown	Juvenile	100	100		
				S-w	3	Unknown	Juvenile	Seen only			
			26	S-w	1	Female	Sub-adult	120	170		
13/06/017	11:00	21.6	37	S-w	1	Unknown	Juvenile	100	100	Hot and dry with 10% cloud cover and a light air (Beaufort scale 1)	CC & FS
15/06/17	12:30	21.3	35	S-w	1	Female	Adult	160	200	Hot, dry and clear with a gentle	CC

			Wooden board	S-w	1	Unknown	Juvenile	120	140	breeze (Beaufort scale 3)	
16/06/17	12:00	21.5	37	S-w	1	Female	Sub-adult	110	140	Hot and dry with 85% cloud cover and a light breeze (Beaufort scale 2)	CC
			Sheeting	S-w	1	Female	Adult	200	70		
			3	S-w	1	Female	Sub-adult	150	150		
19/06/17	09:30	23	39	S-w	1	Unknown	Sub-adult	120	100	Hot, dry and clear with a light air (Beaufort scale 1)	CC
				S-w	1	Male	Adult	170	130		
22/06/17	13:15	25.6	37	S-w	1	Male	Sub-adult	110	120	Hot and dry with 5% cloud cover and a light breeze (Beaufort scale 2)	CC & FM
			8	S-w	1	Male	Sub-adult	110	150		
23/06/17	11:15	20.9	36	S-w	1	Female	Adult	Seen only		Warm and dry with 90% cloud cover and a gentle breeze (Beaufort scale 3)	CG
			16	S-w	1	Unknown	Juvenile	100	135		
			Receptor	S-w	1	Female	Adult	140	180		
			15	S-w	1	Unknown	Juvenile	110	140		
			34	S-w	1	Unknown	Juvenile	Seen only			
				S-w	1	Female	Adult	130	80		
			19	S-w	1	Female	Sub-adult	130	145		
			27	S-w	1	Female	Adult	160	190		
26/06/17	09:30	21.7	39	S-w	1	Female	Adult	140	170	Warm and dry with 50% cloud cover and still (Beaufort scale 0)	CC
			36	S-w	1	Female	Adult	160	200		
			34	S-w	1	Unknown	Juvenile	100	130		
			10	S-w	1	Female	Adult	180	120		
				S-w	1	Female	Adult	150	150		
			S-w	1	Female	Adult	Seen only				
			S-w	1	Unknown	Juvenile	Seen only				

			24	S-w	1	Unknown	Juvenile	Seen only			
27/06/17	10:40	22.3	24	S-w	1	Male	Adult	170	140	Warm, dry and overcast with a moderate breeze (Beaufort scale 4)	CG
			24	S-w	1	Unknown	Juvenile	Seen only			
			6	S-w	1	Male	Sub-adult	115	85		
			Receptor	S-w	1	Female	Sub-adult	Seen only			
			Receptor	S-w	1	Female	Adult	175	110		
			13	S-w	1	Female	Adult	75	145		
				S-w	1	Unknown	Juvenile	Seen only			
			34	S-w	1	Male	Adult	170	100		
			30	S-w	1	Unknown	Juvenile	Seen only			
28/06/17	14:15	16.9	39	S-w	1	Unknown	Juvenile	110	110	Warm, wet, overcast and still (Beaufort scale 0)	CC
			4	S-w	1	Unknown	Sub-adult	110	150		
			5	S-w	1	Unknown	Sub-adult	Seen only			
			24	S-w	1	Unknown	Juvenile	150	100		
				S-w	1	Unknown	Sub-adult	150	150		
29/06/17	10:15	16.6	-	-	-	-	-	-	-	Warm, dry and overcast with a light air (Beaufort scale 1)	CC
30/06/17	13:30	20	-	-	-	-	-	-	-	Warm, dry and overcast with a light air (Beaufort scale 1)	CC & FS
01/07/17	10:20	16	30	S-w	1	Unknown	Sub-adult	85	115	Warm, dry with 20% cloud cover and a light air (Beaufort scale 1)	OM
			24	S-w	1	Unknown	Juvenile	60	70		
			5	S-w	1	Male	Adult	Seen only			
			13	S-w	1	Unknown	Juvenile	65	30		
				S-w	1	Male	Adult	Seen only			

02/07/17	13:10	22	8	S-w	1	Unknown	Sub-adult	100	120	Warm, dry with 20% cloud cover and a light air (Beaufort scale 1)	OM
			14	S-w	1	Female	Adult	130	150		
03/07/17	12:00	21.6	-	-	-	-	-	-	-	Warm, dry and clear with a light air (Beaufort scale 1)	CC
04/07/17	09:00	19	17	S-w	1	Male	Adult	170	70	Warm, dry and clear with a light air (Beaufort scale 1)	CC
				S-w	1	Female	Adult	180	50		
			Destructive search	S-w	1	Unknown	Juvenile	120	100		
				S-w	1	Unknown	Sub-adult	120	150		
				S-w	1	Male	Adult	170	50		
05/07/17	12:15	22	-	-	-	-	-	-	-	Warm, dry and clear with a light air (Beaufort scale 1)	CC
06/07/17	10:00	26	-	-	-	-	-	-	-	Warm and dry with 40% cloud cover and a light air (Beaufort scale 1)	CG
07/07/17	08:30	28	3	S-w	1	Unknown	Juvenile	-	-	Warm and dry with 20% cloud cover and a light air (Beaufort scale 1)	CG
10/07/17	08:30	21	-	-	-	-	-	-	-	Warm, dry and clear with a light air (Beaufort scale 1)	CC
S-w = Slow-worm, Cf = Common frog											

5.1 Constraints

The site featured numerous piles for refuse and stored items as well as overgrown vegetation. This meant when the excavator removed the topsoil it was difficult to inspect for reptiles and observe moving earth through the vegetation due to the number of artificial objects in the soil. Works then had to be undertaken with particular care.

As the original *in-situ* receptor area was wholly inadequate for the larger slow-worm population size, an alternative *in-situ* receptor site had to be established to ensure the welfare of the slow-worms. As the receptor sites will be managed and maintained as suitable for reptiles it is deemed the best option to ensure the long-term survival of the slow-worms.

5.2 Conclusion

The development site had suitable habitat for widespread species of reptile. A total of 29 slow-worms were captured within suitable habitat across the site and translocated to the *in-situ* receptor area, subsequently 96 slow-worms were captured from the entire site and translocated to the second *in-situ* receptor site. The receptor sites will be managed sympathetically for reptiles and are free of foreseeable threats such as future development.

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



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



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

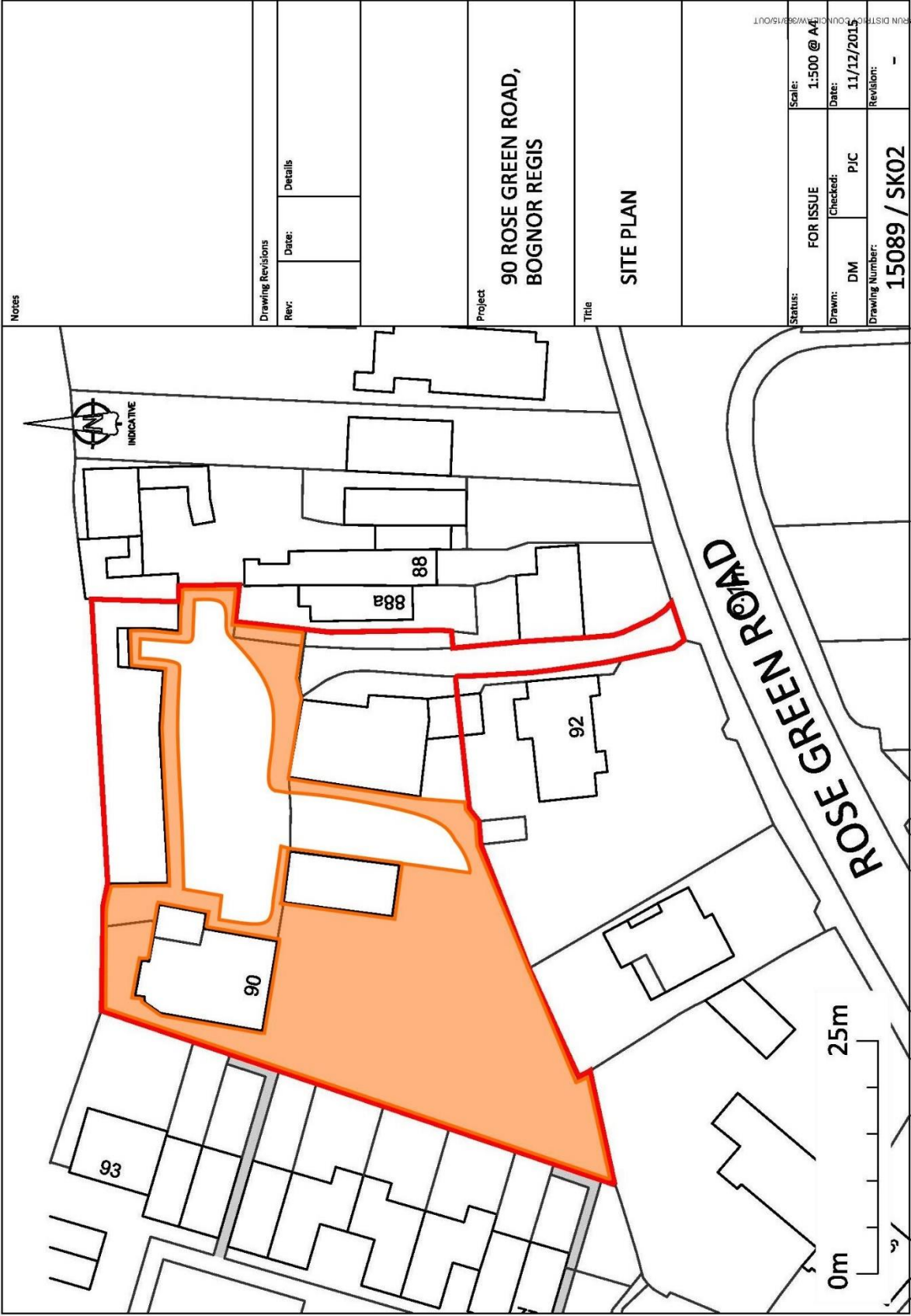
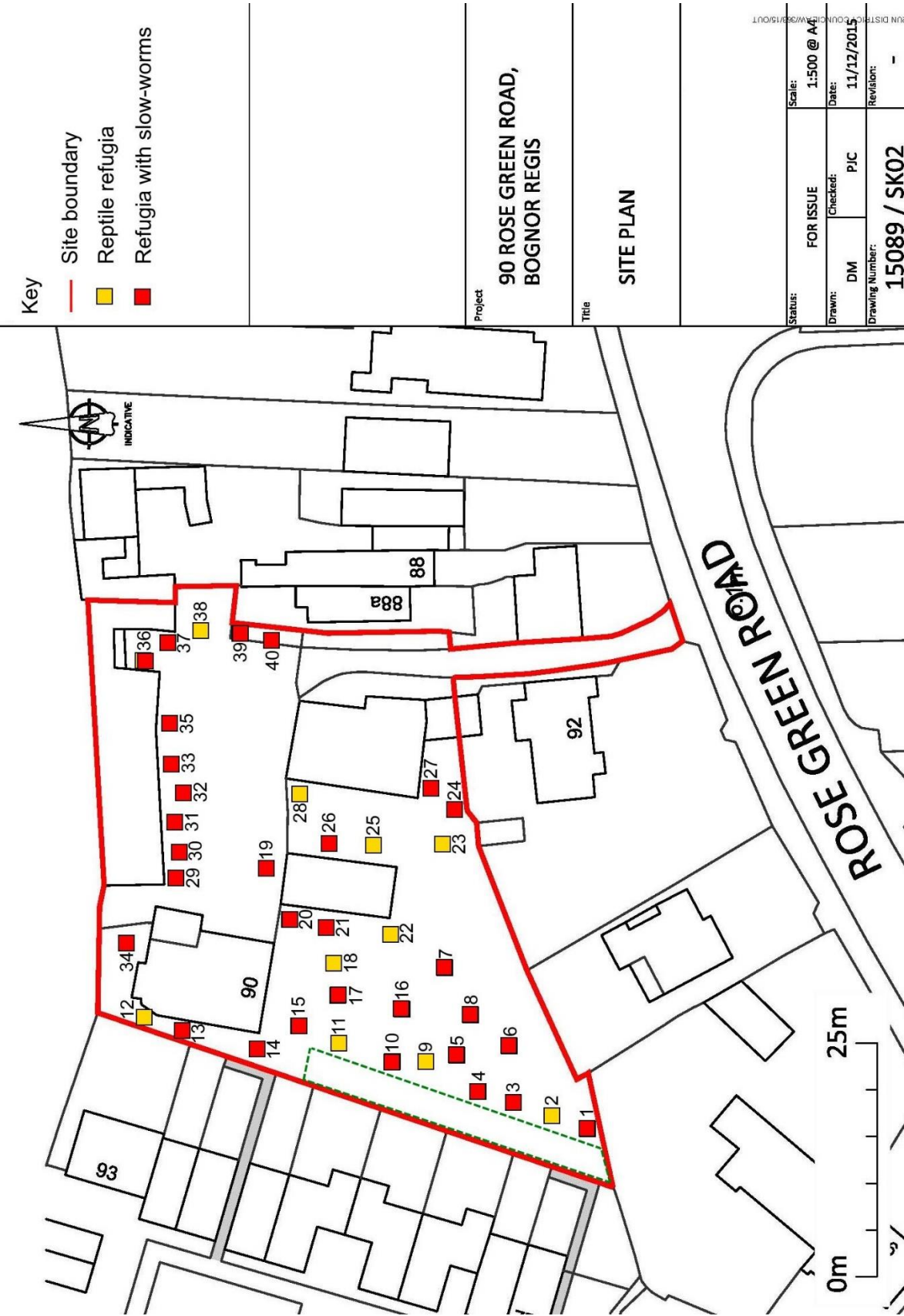


Figure 4. Location of artificial refugia for reptile surveys (refugia with recorded reptiles highlighted).



PHOTOGRAPHS

Photo 1. Example of suitable habitat on site.



Photo 2. Example of refuse piles, offering some suitable reptile habitat on site.



Photo 3. The in-situ receptor site, shortly after creation.



Photo 4. The in-situ receptor site, after the destructive search had been completed.



Photo 5. Destructive search being carried out of areas among the buildings to be demolished.



Photo 6. Example of part of the site, rendered no longer suitable for reptiles by destructive search.



REFERENCES

Beebee, T. & Griffith, R. (2000) *Amphibians and Reptiles*. HarperCollins, London.

Edgar, P, Foster J. & Baker, J. (2010). *Reptile Habitat Management Handbook*. Amphibian and Reptile Conservation, Bournemouth.

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

Gent, T & Gibson, S. (1998) *The Herpetofauna Workers' Manual*. Joint Nature Conservation Committee, Peterborough.

Herpetofauna Groups of Britain and Ireland [HGBI] (1998). *Evaluating local mitigation/translocation programmes: Maintaining Best Practice and lawful standards*. HGBI, c/o Froglife, Halesworth.

HMSO (1981). *Wildlife and Countryside Act 1981*. HMSO, London.

HMSO (2012). *The Conservation of Habitats and Species (Amendment) Regulations 2012*. HMSO, London.

HMSO (2000). *Countryside and Rights of Way Act*. HMSO, London.

Natural England (in prep.). *Reptile Mitigation Guidelines*. Natural England, Peterborough.

Natural England (2011). *Standing Advice for Protected Species: Reptiles*. Natural England, Peterborough.

New Forest Ecological Consultants (2016). *Phase 1 Biodiversity Survey: 90 Rose Green Road, Bognor Regis, West Sussex, PO21 3EQ*. Unpublished.