The Sizewell C Project

6.3 Volume 2 Main Development Site
Chapter 14 Terrestrial Ecology and Ornithology
Appendix 14A6 Reptiles

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SIZEWELL C DEVELOPMENT – MAIN DEVELOPMENT SITE: VOLUME 2, CHAPTER 14:

APPENDIX 14A6 – REPTILES

Documents included within this Appendix are as follows:

APPENDIX 14A6 REPTILES

ANNEX 14A6.1 FIGURES (provided separately)

ANNEX 14A6.2 DESK STUDY

ANNEX 14A6.3 SECONDARY DATA

- Annex 14A6.3 Amec 2012 Sizewell C New Nuclear Power Station: Terrestrial and Freshwater Ecology, and Ornithology. Reptile Survey Report 2007
- Annex 14A6.3 Amec 2012 Sizewell C New Nuclear Power Station: Terrestrial and Freshwater Ecology, and Ornithology: Coronation Wood Reptile Survey Report 2012.
- Annex 14A6.3 Entec 2008 Sizewell Power Station ISFSI and Car Park Extension Reptile Survey Report 2008.
- Annex 14A6.3 Entec 2010 Aldhurst Farm Reptile Survey Report 2010

ANNEX 14A6.4 PRIMARY DATA

NOTE:

Please note that the red line boundary used in figures within this document may have since been amended, and therefore does not reflect the boundaries in respect of which development consent has been sought in this application. However, the amendment to the red line boundary does not have any impact on the findings set out in this document and all other information remains correct.

VOLUME 2, CHAPTER 14: APPENDIX 14A6 – REPTILES

Contents

Tables

Figures

Executive Summary

This appendix assesses the baseline conditions for four terrestrial reptile species (adder (*Vipera berus*), common lizard (*Zootoca vivipara*), grass snake (*Natrix helvetica helvetica*) and slow-worm (*Anguis fragilis*)) within the Zone of Influence (ZOI) of the Sizewell C power station at the main development site (hereafter referred to as the "proposed development").

All four species are protected under Schedule 5 of the Wildlife and Countryside Act (Ref. 1.1) and are included within Section 41 of the Natural Environment and Rural Communities (NERC) Act (Ref. 1.2), which identifies them as species of principal importance for the purpose of conserving biodiversity. Adder, common lizard, grass snake and slow-worm are also priority species in the Suffolk Biodiversity Action Plan (Ref. 1.3).

Desk-study data from the Suffolk Biodiversity Information Service (SBIS) was obtained for notable species of conservation concern within 2 kilometres (km) of the proposed development site (hereafter referred to as the "site"). All four species were widely distributed across suitable habitats within the site.

Surveys carried out by Wood Group (formerly Entec and Amec Foster Wheeler) on the EDF Energy Estate between 2007 and 2012 recorded regular observations of all four reptile species including adults, sub-adults and juveniles. It was observed that species distribution varied for slow-worm and common lizard, but no clear habitat preference was identified for adder or grass snake.

Further surveys were carried out by Arcadis Consulting (UK) Limited (formerly Hyder Consulting, and hereafter referred to as Arcadis) to update the Wood Group data and provide more robust population estimates of the four reptile species. These involved surveys in 2015 to 2016 of all representative habitats suitable for reptiles, notably arable hedgerow margin, conifer plantation, ride, scrub, the part of Sizewell Marshes Sites of Special Scientific Interest (SSSI) to be lost to the proposed development, open grassland/scrub habitat, and landscape plantation on the main platform. Within the site, mean population density estimates were calculated as: common lizard, 6.0 per ha; slow-worm, 12.1 per ha; adder, 9.3 per ha; and grass snake, 6.1 per ha.

To ensure a robust Ecological Impact Assessment (EcIA) process, all reptile populations within the ZOI of the proposed development have been assessed to determine whether or not they would qualify as Important Ecological Features (IEFs) as defined in Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines on EcIA (Ref. 1.4). In addition, the reptile populations have been assessed in accordance with the standard Environmental Impact Assessment (EIA) methodology used elsewhere within the **Environmental Statement** (ES).

On the basis of this assessment, the reptile assemblage as a whole (adder, grass snake, common lizard and slow-worm) on the site and the wider study area constitutes a Key Reptile Site (Ref. 1.5), and is considered to be an IEF at the regional level

under the CIEEM guidelines (Ref. 1.4) and of medium importance, following the EIA-specific assessment methodology.

1. Reptiles

1.1 Introduction

a) Purpose of this appendix

1.1.1 This is an appendix to the Sizewell C power station at the main development site (referred to throughout this volume as the "proposed development") **Volume 2, Chapter 14** of the **ES.** This appendix presents the reptile baseline for the proposed development site (hereafter referred to as the "site") and its ZOI.

b) Establishing Zone of Influence, study area and survey area

1.1.2 For reptiles, the ZOI and study area is defined as the site and an additional buffer area of 2km. The survey area is defined as the site boundary.

c) Structure of this appendix

1.1.3 This appendix has been set out as follows:

- **Section 2** sets out the approach and methodology used for obtaining the desk-study and secondary data, as well as the results of this data acquisition. The detail of the desk-study information acquired is presented in **Annex 14A6.2**, whilst the secondary data reports are presented in **Annex 14A6.3**.
- **Section 3** first sets out the approach and methodology for obtaining the primary data, then provides the results of this survey work. The detailed data underpinning these results are presented in **Annex 14A6.4**.
- Finally, **section 4** brings together all of this information into a detailed consideration of the baseline conditions for reptiles within the proposed development and identifies those IEFs (whether individual species or an assemblage of species) to be taken forward to be considered and assessed with the EcIA.

1.1.4 Figures summarising the ecological baseline with regard to reptiles are presented in **Annex 14A6.1 – Figures**.

1.2 Desk-study/secondary data

a) Approach and methodology

i. Desk-study

1.2.1 Records for reptiles were requested from SBIS in 2014 and 2018 for protected or otherwise notable species of conservation concern within 2km of the site boundary. Citations for all designated sites (statutory and non-statutory) within 2km of the site were reviewed to ascertain whether or not reptiles are cited as interest features of these sites. The Suffolk Biodiversity Action Plan (BAP) (Ref. 1.3), Suffolk's Priority Species and Habitats list (Ref. 1.6), and the species of principal importance included on the Section 41 list of the NERC Act, were also reviewed with reference to the species present, or likely to be present, within the site and the wider study area.

ii. Secondary data

Wood Group

1.2.2 A number of reptile surveys have been carried out by Suffolk Wildlife Trust (SWT) (for on behalf of NGL) since 2005, with a summary provided within each of their annual Sizewell Land Management Reports.

1.2.3 In 2006 (Ref. 1.13), artificial refugia were placed in suitable habitat within the plantation woodland of Kenton Hills and Goose Hill. The refugia were checked between April and October 2006. The following year, only the refugia within Goose Hill were checked, with visits made between May and September 2007 (Ref. 1.14). Ad hoc checks of these refugia continued during 2008 and 2009 (Ref. 1.15; Ref. 1.16).

1.2.4 In 2012, SWT conducted a survey at the location of the proposed Sizewell B Emergency Response Centre at Sizewell Halt, to the east of Leiston (Ref. 1.17). Naturally occurring and artificial refugia were checked during this survey.

1.2.5 During 2013, a reptile survey was also carried out at Black Walks (Ref. 1.18), involving the checking of 20 artificial refugia.

1.2.6 Reptile surveys have also been undertaken, from 2006 to 2013, as part of the Galloper Wind Farm onshore substation project, located directly to the east of Pillbox Field (Ref. 1.19; Ref. 1.20) (see **Figure 14A6.1**). A 17-day translocation exercise also took place in 2007 over an area of 6.5 hectares (ha), in habitat including semi-improved grassland, boundary features and broadleaved woodland plantation. A further translocation took place in 2013, with visits between June and mid-August 2013.

1.2.7 Freedom Group have also carried out reptile surveys at Coronation Wood and Pillbox Field (Ref. 1.21). Eighty-five refugia were placed across 5ha of Coronation Wood at a density of 17 refugia per ha, and 94 refugia placed across 7.2ha of Pillbox Field at a density of 13 refugia per ha. Survey visits were carried out between 23 September and 2 November 2015.

b) Results

i. Desk-study

1.2.8 No statutory or non-statutory designated site within 2km of the site have reptiles cited as a qualifying feature. Full details on the sites present, and their reasons for designation, are provided in **Appendix 14A2** – Designated Sites.

1.2.9 The site (and wider study area) supports four reptile species, namely adder (*Vipera berus*), common lizard (*Zootoca vivipara*), grass snake (*Natrix helvetica helvetica*) and slow-worm (*Anguis fragilis*).

1.2.10 The desk-study revealed 253 records of reptiles from 1994 to 2017 within 2km of the site. Species recorded included adder, common lizard, grass snake and slow-worm. The full results of the desk-study area are presented in **Annex 14A6.2**.

1.2.11 Data showed that all four species were widely distributed across the study area; however, there appeared to be concentrations of these species in the following areas: the Royal Society for the Protection of Birds (RSPB) Minsmere Reserve and adjacent locations of Westleton Walks and Eastbridge to the north of the site boundary; Leiston, including the urban area and parts of Leiston Common, immediately to the south-west; Aldringham, North Warren and Thorpness to the south; and the EDF Energy Estate itself.

1.2.12 Records within the EDF Energy Estate were mainly associated with coastal habitats (dunes and shingle) and the plantation woodland of Kenton Hills and Goose Hill.

1.2.13 The review of the Suffolk BAP (Ref. 1.3) and Suffolk's Priority Species and Habitats list (Ref. 1.6) identified adder, common lizard, grass snake and slow-worm as priority species. In addition, all four species are protected in England under Schedule 5 of the Wildlife and Countryside Act (Ref. 1.1), and all four species are included within Section 41 of the NERC Act.

ii. Secondary data

Wood Group

1.2.14 Regular observations of adder, common lizard, grass snake and slow-worm were made in 2007 surveys of the site throughout the survey period, including adults, sub-adults and juveniles. Full results are presented in **Annex 14A6.3** and summarised in **Table 1.1** which presents the maximum number of adult reptiles of each species recorded on any one survey day. **Figures 14A6.2** to **Figure 14A6.5** show the distribution and abundance of common lizard, slow-worm, adder and grass snake from these surveys.

1.2.15 The common lizard populations were primarily distributed in habitats closer to the coast, most notably within ungrazed grassland swards and coastal grassland habitat. Low numbers were observed at isolated locations within the plantation woodland of Dunwich Forest and Goose Hill, with records absent further west. In contrast, slow-worm was recorded at greater densities within the woodland habitat along ride edges, with lower densities within ungrazed grasslands, and an absence from more open habitats towards the coast. Slow-worms were found primarily in areas close to dense scrub and/or woodland habitat.

1.2.16 Adders were observed equally frequently in both the open grassland habitats to the east of the survey area and within plantation woodland habitats. Grass snakes showed a similar distribution to adder, although they were recorded slightly more frequently than adder, often associated with wetland habitat or features. For both adder and grass snake, there was a greater density of records within Dunwich Forest/Goose Hill.

1.2.17 The results of the 2008 reptile survey of the site adjacent to Sizewell B power station were: common lizard (five sightings, all female, with a maximum of one adult per visit) and grass snake (one juvenile grass snake). In addition, a dead mature adder was noted approximately 30 metres (m) south-east of the survey area. It is likely that this individual originated from the site owing to the absence of other suitable habitat within its surroundings.

Table 1.1: Summary of the Wood Group reptile surveys.

Reptile Species.	Maximum Adult Count at Site (Ref. 1.7).	Maximum Adult Count at Coronation Wood and Adjacent Land (Ref. 1.8).	Maximum Adult Count at Aldhurst Farm (Ref. 1.12).
Common lizard.	15	9	7
Slow-worm.	31	3	0
Adder.	17	1	1
Grass snake.	9	1	3

1.2.18 All four common native reptile species were also found within Coronation Wood in the 2012 survey, although only at low densities (see **Table 1.1**). This was attributed to the limited availability of suitable habitat, which was restricted to small areas of woodland edge, woodland glades containing rank improved grassland, scrub and patches of tall herbs which offer opportunities for sheltering, basking and foraging. Despite the majority of the site being sub-optimal habitat for reptiles, a "good" population of common lizard was estimated to be present here (based on Froglife criteria (Ref. 1.5)), predominantly within clearings of tussocky grassland to the north of Sizewell B power station.

1.2.19 The surveys at Aldhurst Farm found common lizard, grass snake and adder, but no slow-worm; both adults and juveniles were recorded for common lizard and grass snake. The survey results are summarised in **Table 1.1**.

Other secondary data

1.2.20 The reptile survey carried out by SWT in 2006 revealed the presence of grass snake, common lizard and slow-worm within the plantation woodland of Goose Hill and Kenton Hills. Surveys undertaken in 2007 also recorded adder. Ad hoc checks for reptiles by SWT undertaken during 2008 and 2009 within Goose Hill confirmed the continued presence of grass snake and adder within suitable habitat.

1.2.21 Surveys undertaken by SWT at Sizewell Halt identified all four common species of reptile within the survey area. Mitigation for the development work here (unrelated to the proposed development) included creation of a reptile receptor area within the site boundary. A monitoring survey of the receptor area was carried out during 2014, and slow-worm, common lizard, adder and grass snake were all confirmed to be still present. Outside of the site boundary, the survey by SWT at Black Walks recorded two adders and a single grass snake.

1.2.22 The predominant habitats in the Galloper Wind Farm onshore substation study area (approximate size 27.2ha) were arable farmland, semi-natural broadleaved and mixed woodland, plantation woodland and semi-improved grassland (Ref. 1.19; Ref. 1.20). Reptile surveys revealed that the woodland interior was not suitable reptile habitat, given the dense shade and lack of suitable cover. It was established that the woodland edge habitat and other boundary features, such as hedge-lined paths did support populations of reptiles. Results for the 2010–2011 surveys are presented in **Table 1.2**.

Table 1.2: Summary of the reptile surveys results for the Galloper Wind Farm onshore substation development.

Reptile Species.	Maximum Adult Count.	Density Per ha (Within Suitable Habitat).
Common lizard.	10	1.5
Slow-worm.	5	0.8
Adder.	2	0.3
Grass snake.	4	0.6

1.2.23 Over the 17 trapping days of the 2007 translocation exercise, 50 grass snakes and common lizards were translocated. **Table 1.3** presents the results of the 2013 translocation exercise.

Table 1.3: Summary of the 2013 reptile translocation data for the Galloper Wind Farm onshore substation development.

Location	Species				Total
	Common Lizard	Slow-Worm	Adder	Grass Snake	
1	18	35	3	3	59
2	0	3	0	0	3
3	1	5	1	3	10
4	3	2	0	1	6
5	1	0	0	0	1
6	0	2	0	0	2
7	5	4	0	5	14
8	1	0	0	0	1
Total	**29**	**51**	**4**	**12**	**96**
Density	**4.5/ha**	**7.8/ha**	**0.6/ha**	**1.8/ha**	

1.2.24 Survey results and population classifications for the Coronation Wood and Pillbox Field surveys (Ref. 1.21) are presented in **Table 1.4**. Low populations of all four reptile species were found. In Coronation Wood, reptiles were found along the woodland edge and in an open glade; no reptiles were found in the denser wooded interior. In Pillbox Field, few reptiles were found in the central parts of the field, with most found along boundary hedgerows.

Table 1.4: Summary of the reptile surveys results for Coronation Wood and Pillbox Field (1.21).

Species.	Maximum Adult Count.	Max Density (Count/ha).	Population Classification based on Froglife Criteria (Ref. 1.5).
Coronation Wood.			
Common lizard.	0	0	Nil
Slow-worm.	1	0.2	Low
Adder.	0	0	Nil
Grass snake.	0	0	Nil
Pillbox Field.			
Common lizard.	2	0.3	Low
Slow-worm.	1	0.1	Low
Adder.	1	0.1	Low
Grass snake.	1	0.1	Low

1.3 Field surveys – primary data

a) Approach and methodology

1.3.1 Further surveys have been carried out by Arcadis Consulting (UK) Limited (formerly Hyder Consulting, and hereafter referred to as Arcadis) to update the Wood Group data, and to provide more robust population estimates of the four reptile species to inform the development of the Reptile Mitigation Strategy (Ref. 1.22) which has been submitted as part of the **ES** (see **Appendix 14C2A**).

1.3.2 In 2015 and 2016, Arcadis carried out surveys of representative habitats suitable for reptiles across the site and the ZOI. In September 2014, and throughout the Summer of 2015, surveys were also carried out of the proposed reptile receptor sites. The aim of this was to determine, in accordance with the Reptile Mitigation Strategy, whether or not these sites remained suitable to receive translocated reptile populations (i.e. confirming that they did not already support an established population of reptiles). An additional reptile survey was also carried out by Arcadis in the Pillbox Field in 2015 as part of a separate study for the Sizewell B relocated facilities proposed development.

b) Method

i. 2014 survey of selected receptor sites

1.3.3 Artificial refugia, in the form of squares of roofing felt (approximately 1 metre square (m^2)), were deployed in locations considered to have the highest potential to support reptiles in three of the proposed reptile receptor sites (Kenton Hills, St. James Covert and Broom Covert). Refugia were deployed at a density of 5-10 per ha (or greater) in accordance with guidance produced by Froglife (Ref. 1.5).

1.3.4 Refugia were allowed to "bed in" for seven days before surveys commenced, to give sufficient time for discovery and utilisation by reptiles. Refugia were then checked regularly between 18 September and 15 October 2014. All refugia were checked, and the species, sex and age-class of any reptiles seen sheltering above and beneath the refugia were recorded.

1.3.5 As the surveys were commissioned late in the survey season, only seven visits were possible, targeted at the optimum recording period of September/ October 2014. Surveys of Broom Covert were requested slightly later than the other sites; therefore, this was not included within the first survey visit.

ii. 2015 reptile surveys to estimate population densities at donor and receptor sites

1.3.6 Reptile surveys, following standard techniques (Ref. 1.5; Ref. 1.11) using artificial refugia (including roof felt, and "Onduline" which is considered a better material for surveying for adder) were carried out in a representative sample of different donor site habitats and selected proposed receptor sites. The receptor site surveys were aimed at confirming low densities of reptiles on the latter. **Figure 14A6.6** shows the locations of the survey sites, and their details, along with the numbers of surveys carried out at each site, are described in **Table 1.5**. Further details on these surveys are presented in **Annex 14A6.4**.

1.3.7 Surveys were carried out in five habitat types of varying suitability for reptiles within three areas of the proposal site (the main platform, Goose Hill and hedgerows/field margins in arable fields to the north of Kenton Hills). The following donor site habitats were surveyed (see **Figure 14A6.6** for reptile survey locations):

- arable hedgerow margin (Area 1);
- conifer plantation at Goose Hill (Area 2);

- ride habitat within Goose Hill plantation (Area 3);
- scrub on southern edge of Goose Hill (Area 4);
- main platform: open grassland/scrub habitat (Area 7); and
- main platform: landscape plantation (Area 8).

1.3.8 In addition, the following proposed receptor sites were also surveyed:

- Kenton Hills: clear-fell habitat with natural heath and scrub regeneration (Area 5);
- St James Covert: clear-fell habitat with natural heath and scrub regeneration (Area 6); and
- Studio Field: an area of generally flat former arable land (sown to acid grassland in 2015), with a number of hedgerows surrounding the field (Area 9).

Table 1.5: Arcadis 2015 reptile survey areas.

Site.	Site ID (see Figure 14A6.6).	Refugia Distribution.	Amount of Habitat.		No. of Surveys.
			Area (ha).	Length (m).	
Arable hedgerow margin.	1	Linear along field margin.	0.24[1]	599m	34
Conifer plantation, Goose Hill.	2	Grid (10*10).	1.0	-	30
Ride habitat, Goose Hill.	3	Linear along rides.	0.27[1]	675m	33
Scrub habitat, Goose Hill.	4	Grid (~25*4).	1.0	-	37
Open grassland/ scrub habitat, main platform.	7	Irregular	0.7	-	32
Landscape plantation, main platform.	8	Grid (10*10).	0.8	-	27
Clear-fell habitat, Kenton Hills.	5	Grid (10*10).	0.9	-	26
Clear-fell habitat, St. James Covert.	6	Irregular within reptile fencing.	1.1	-	30
Former arable land, Studio Field.	9	Grid	1.1	-	21

[1] *Based on width of linear feature of 4m.*

1.3.9 In each site, 100 reptile refugia were set out at approximate 10m intervals in an area of approximately 1ha. For the arable hedgerow margin and ride habitats, the refugia were arranged linearly (either side of the hedge or ride); in other sites the refugia were laid in a grid. Refugia were allowed to "bed in" for seven days before surveys commenced, to give sufficient time for discovery and utilisation by reptiles.

1.3.10 Surveys were undertaken from April to October 2015, with a reduced intensity of survey effort occurring in July and August 2015, as warm weather during this period reduces the requirement of reptiles to bask, therefore resulting in surveyors being less likely to encounter and catch them. Refugia were checked on a regular basis between one and two times per week, during early morning and late afternoon survey sessions.

1.3.11 The species, sex and age-class of any reptiles seen sheltering above or beneath the refugia were recorded. For adder and grass snake, photographic identification of characteristic scale patterns was also taken, as these techniques have been used successfully in Capture-Mark-Recapture studies (Ref. 1.11) (see **Annex 14A6.4 (iii)**). For slow-worm and common lizard, their lack of distinct markings makes photographic identification difficult for Capture-Mark-Recapture studies, so population size classes (small, medium and large) were estimated following criteria set out in Froglife (Ref. 1.5).

iii. 2016 surveys of Goodrums Fen (within Sizewell Marshes Sites of Special Scientific Interest (SSSI))

1.3.12 Within the Goodrums Fens survey area (Area 10), 100 reptile tins were set out in suitable reptile habitat approximately 10m apart, covering a non-contiguous area of 1ha. Ten survey visits were carried out between March and June 2016, with an additional survey visit in August 2016. Photographic identification of characteristic scale patterns was also taken for snake species, for Capture-Mark-Recapture studies.

iv. 2015 surveys of Pillbox Field

1.3.13 In addition to the surveys described above for the donor and receptor sites, reptile surveys were carried out in Pillbox Field to the south of Sizewell A and B power stations, as this site was under consideration as a car-parking option for the Sizewell B relocated facilities proposed development (see **Figure 14A6.6**). This field comprises arable land with a strip of poor semi-improved grassland at its northern extent, and an area of mixed plantation and semi-natural broadleaved woodland on its eastern edge.

1.3.14 Forty-three reptile refugia were laid around the edge of this 7ha field at approximately 10m intervals, on 17 August 2015. These refugia were then

checked regularly between 8 September and 20 October 2015, and any reptiles seen classified to species, sex and age class as described above.

v. Estimating reptile population density from reptile survey counts and surveys of suitable habitat

1.3.15 Arcadis compared the numbers of reptiles recorded during survey work at the Galloper Wind Farm onshore substation facility with the numbers of reptiles subsequently translocated from the same area (Ref. 1.19; Ref. 1.20). Arcadis also compared survey results from direct observations of snakes with those obtained by Capture-Mark-Recapture data. In both cases, the aim was to obtain a comparison of reptile numbers seen by conventional field surveys with those found by translocation or Capture-Mark-Recapture studies.

1.3.16 A literature review was also carried out to provide figures for typical densities of reptiles in good and exceptional habitats in the UK.

1.3.17 Phase 1 habitat surveys maps and aerial photographs were examined to calculate the areas of suitable habitat (similar to that in which the detailed surveys were carried out in 2015) for reptiles across the site and the wider study area. This was done for five broad habitat areas across the site in which the intensive 2015 reptile surveys were carried out.

1.3.18 The density estimates from the 2015 surveys, population comparisons from different survey methodologies, and measurements of the areas of good habitat from maps and aerial photographs, were then combined to provide estimates of the densities of reptiles over the site.

c) Results

i. 2014 survey of selected receptor sites

1.3.19 Four compartments within Kenton Hills and the interior of St. James Covert were clear-felled in 2008 and 2010 respectively, and now, therefore, comprise areas of natural heath and scrub regeneration surrounded by reptile-proof fencing. Broom Covert is an area of lowland acid grassland/gorse scrub mosaic, which has historically been grazed heavily during the Winter months, resulting in a short (less than 5cm) sward (note that grazing ceased at Broom Covert in Spring 2016 when the cattle were removed).

1.3.20 Small numbers of reptiles were recorded at all three sites within the survey period. Common lizard and slow-worm were recorded in all areas, while adder was only observed within the receptor site at Kenton Hills. Full survey details are presented in **Annex 14A6.4**. In brief these were: common lizard (seven sightings with a maximum of two adults per visit), slow-worm (seven

sightings with a maximum of two adults per visit) and adder (two sightings with a maximum of one sub-adult per visit).

ii. 2015 reptile surveys to estimate population densities at donor and receptor sites

1.3.21 A summary of the reptile survey results is presented in **Table 1.6**, recording the maximum number of individual reptiles of each species seen on any one survey occasion. Full survey results are presented in **Annex 14A6.4**.

1.3.22 With regard to Capture-Mark-Recapture results for snakes, 54 adders and 27 grass snakes were caught and photographed for individual identification. Of these, 39 adders were different individuals (12 males, 23 females and 4 juveniles), and 20 grass snakes were different individuals.

1.3.23 Population estimates for adder at Area 4 (scrub habitat, Goose Hill), Area 7 (open grassland/scrub habitat, main platform), and Area 5 (clear fell habitat Kenton Hills), and for grass snake at Area 1 (arable hedgerow margins), were based on Capture-Mark-Recapture analysis, as there was sufficient data to enable the calculation to be carried out.

1.3.24 Capture-Mark-Recapture data from snake recaptures could not be used to predict population sizes in any of the other capture areas. For these areas, population estimates were made using the total numbers of different adult individuals caught, based on criteria in Froglife (Ref. 1.5).

1.3.25 For the donor sites, the highest catch numbers for both snake species were in the scrub habitat in Goose Hill and open grass/scrub habitat in the main platform, along with the arable margin habitat (primarily in the Autumn) for grass snake. These habitats provide the mix of open areas (for basking) and sheltered areas (for cover) that reptiles prefer. Grass snakes are often associated with wetland habitats, but can be found in many other habitats, including grassland and farmland (Ref. 1.23). The arable margins may form part of the grass snake habitat (providing small mammal prey to supplement their primarily amphibian diet) and may act as corridors when leaving and returning to hibernation sites. Both the scrub margins to Goose Hill and open grassland within the main platform provide sunny areas for basking adder located next to dense cover (bracken and scrub) and are also likely to support good populations of prey. Survey for reptile prey items (Ref. 1.23) indicate that both these areas support moderate numbers of small mammals, and good numbers of common lizard (prey for snakes).

1.3.26 Slow-worm numbers were highest in the arable margin habitat, high in both the scrub and ride habitats in Goose Hill, less common in the open grass/scrub habitat in the main platform, and low in (or absent from) the plantation habitats. It is likely that the arable margins, being well

established, provide abundant worms, slugs and other slow-worm prey items.

1.3.27 Common lizard numbers were highest in the open grass/scrub habitat in the main platform but were less common in the ride and scrub habitats of Goose Hill, and were absent from the arable margins. All of these areas provide sunny areas for basking, and a varied vegetation heterogeneity with short and bare patches as well as areas of dense cover. Common lizard will catch invertebrate prey in open sunny patches, retreating to cover when disturbed. The survey for reptile prey items (Ref. 1.23) indicates that these areas do indeed support moderate numbers of invertebrate prey.

1.3.28 Seasonal variation in the proportion of different reptile species caught was noted and is explored in greater detail in **Annex 14A6.4.**

Table 1.6. Maximum numbers of adult reptiles found per survey visit and population age class estimation for each of the six donor sites and three receptor sites[1].

Site.	Site ID.	Common Lizard.		Slow-worm.		Adder.		Grass Snake.	
		Maximum Number of Adults.	Population Score.	Maximum Number of Adults.	Population Score.	Maximum Number of Adults.	Population Score.	Maximum Number of Adults.	Population Score.
Donor sites.									
Arable hedgerow margin.	1	0	Low	7	Good	0	Low	2	Low
								6[1]	Good
Conifer plantation, Goose Hill.	2	1	Low	1	Low	0	Low	1	Low
Ride habitat, Goose Hill.	3	2	Low	5	Good	0	Low	1	Low
Scrub habitat, Goose Hill.	4	7	Good	15	Good	4	Low	2	Low
						22[1]	Exceptional		
Open grassland/ scrub habitat, main platform.	7	11	Good	6	Good	4	Low	0	Low
						22[1]	Exceptional		
Landscape plantation, main platform.	8	4	Low	0	Low	1	Low	0	Low
Receptor sites.									
Clear fell habitat,	5	3	Low	4	Low	2	Low	1	Low

[1] Capture-Mark-Recapture data is included for adder at three sites and grass snake at one site, marked 1.

Site.	Site ID.	Common Lizard.		Slow-worm.		Adder.		Grass Snake.	
		Maximum Number of Adults.	Population Score.	Maximum Number of Adults.	Population Score.	Maximum Number of Adults.	Population Score.	Maximum Number of Adults.	Population Score.
Kenton Hills.						5[1]	Good		
Clear fell habitat, St. James.	6	1	Low	8	Good	1	Low	1	Low
Former arable land, Studio Field.	9	2	Low	0	Low	1	Low	0	Low

[1] *Estimate by Capture-Mark-Recapture of adder at Area 4 and Area 7, and grass snake at Area 1.*

1.3.29 Reptile surveys of suitable habitat were carried out by Wood Group (formerly Entec and Amec Foster Wheeler) in 2007, 2008 and 2012 (Ref. 1.7, Ref. 1.8, Ref. 1.9, Ref. 1.10) within the site. The detailed methodology, timings and results of these surveys are presented in these Wood Group reports, and the detailed methodology and results are presented in Annex 14A6.3. The methods applied followed guidance provided in Gent and Gibson (Ref. 1.11) and Froglife (Ref. 1.5). Locations of the survey area and the artificial refugia used on the site are shown on Figure 14A6.1.

1.3.30 The 2007 survey of the site (Ref. 1.7) aimed to establish whether reptiles were present and if so, the size of the species' populations. During the survey, 163 artificial refugia were checked, as well as naturally occurring refugia, between June and October 2007. Survey effort was concentrated on the optimal months of September and October 2007.

1.3.31 In 2008 (Ref. 1.8), a reptile survey was carried out ahead of car park-related building work within and immediately adjacent to the existing Sizewell B power station. Forty artificial refugia were laid out across approximately 0.5ha of suitable reptile habitat, and visits made between mid-September and early October 2008.

1.3.32 A reptile survey was undertaken in 2012 (Ref. 1.10) of suitable habitat to the north and west of the existing Sizewell B power station, including Coronation Wood. Fifty-five artificial refugia were checked, as well as naturally occurring refugia, on visits made between August and early October 2012.

1.3.33 Wood Group (Ref. 1.12) also carried out reptile surveys at Aldhurst Farm, surveying 5ha of suitable habitat within what was at the time 67ha of arable farmland.

iii. Other secondary data

1.3.34 **Table 1.7** and **Table 1.8** present density estimates from the 2015 Arcadis surveys, by site and species respectively. Mean density figures for all the donor sites (ID 1, 2, 3, 4, 7, 8) give "good" populations of all four species, following Froglife criteria (Ref. 1.5).

Table 1.7: Average population density for the reptile sites.

Site.	ID.	Common Lizard Density/ha.	Slow-worm Density/ha.	Adder Density/ha.	Grass Snake Density/ha.
Arable hedgerow margin.	1	0	29.2	0	8.3
		-	-	-	25.01
Conifer plantation, Goose Hill.	2	1.0	1.0	0	1.0

Site.	ID.	Common Lizard Density/ha.	Slow-worm Density/ha.	Adder Density/ha.	Grass Snake Density/ha.
Ride habitat, Goose Hill.	3	7.4	18.5	0	3.7
Scrub habitat, Goose Hill.	4	15.0	7.0	4.0	2.0
		-	-	22.4[1]	-
Open grassland/scrub habitat, main platform.	7	15.7	8.6	5.7	0
		-	-	32.0[1]	-
Landscape plantation, main platform.	8	5.0	0	1.3	0
Clear fell habitat, Kenton Hills.	5	3.3	4.4	1.1	1.1
		-	-	5.6[1]	-
Clear fell habitat, St. James.	6	0.9	7.3	0.9	0.9

[1] *Estimate by Capture-Mark-Recapture of adder at Area 4, Area 5 and Area 7, and grass snake at Area 1.*

Table 1.8: Mean density estimates of adult reptiles for the donor sites (Area IDs 1, 2, 3, 4, 7, 8). Capture-Mark-Recapture data is also included for adder and grass snake.

	Common Lizard.		Slow-Worm.		Adder.		Grass Snake.	
	Max. Adult Count.	Density / ha.	Max. Adult Count.	Density/ ha.	Max. Adult Count.	Density /ha.	Max. Adult Count.	Density /ha.
Mean donor site density.	4.2	6.0	5.7	12.1	1.5	1.8	1.0	2.7
Mean donor site density – using Capture-Mark-Recapture.	-	-	-	-	-	9.3	-	6.1

d) 2016 Surveys of Goodrums Fen

1.3.35 **Table 1.9** details the maximum number of each species found per survey within the Goodrums Fen survey area. An evaluation of the size and importance of reptile populations was made using criteria set out in Froglife (Ref. 1.5).

1.3.36 Using Capture-Mark-Recapture, four grass snakes were caught and photographed for individual identification, all of which were different individuals. Population estimates of grass snake within this area therefore could be made using the Capture-Mark-Recapture model. Insufficient

numbers of different adder were caught for Capture-Mark-Recapture analysis.

Table 1.9: 2016 summary reptile survey results at Goodrum's Fen.

Species.	Maximum Number per Survey (Equivalent to Density/ha).	Population Score.
Common lizard.	5	Good
Slow-worm.	16	Good
Grass snake.	2	Low
Adder.	5	Good

1.3.37 **Table 1.9** shows "good" populations of adder, common lizard and slow-worm estimated within Goodrums Fen, and a "low" population score estimated for grass snake.

e) 2015 surveys of Pillbox Field

1.3.38 Small populations of all four reptile species were recorded within the survey period, with a maximum of two adult common lizard per visit, two adult slow-worm per visit, one juvenile adder and one sub-adult grass snake. Full survey details are presented in **Annex 14A6.4**.

f) Estimating reptile population density from reptile survey counts

1.3.39 Methods of population assessment are basic in nature (Ref. 1.5), and a survey is only ever likely to reveal a fraction of the population present. In the following assessments, a range of methodologies have been used to estimate reptile population densities.

1.3.40 From the Galloper Wind Farm surveys, it was possible to compare the numbers of reptiles of each species caught during the translocation exercise with the previous population density estimate from tinning surveys. This gives a ratio indicating the extent to which observational field surveys underestimate the number of individual reptiles present. The ratio for reptiles as a whole is 5:1. For the individual species, the ratios are:

- common lizard – 3:1;
- slow-worm – 10:1;
- adder – 2:1; and
- grass snake – 3:1.

1.3.41 In 2015, Arcadis carried out a Capture-Mark-Recapture study (see paragraphs 1.3.6 to 1.3.11**,** and **Annex 14A6.4**). Comparing maximum numbers of adder seen on any one survey day with the Capture-Mark-Recapture data, there was an approximate five-fold increase in the density estimate from Capture-Mark-Recapture. For grass snake, the equivalent figure was a three-fold increase.

1.3.42 In Arcadis's experience (based on previous project work), as many as ten times the maximum numbers of reptiles recorded in surveys may subsequently be captured during a translocation exercise. Arcadis has also carried out a web-based review of other reptile translocation projects to compare the number of reptiles identified by the survey with the actual number caught and moved. The results vary considerably (and are clearly influenced by the effectiveness, or otherwise, of the survey), and suggest that survey work can under-estimate the actual population of reptiles by a factor of between 4 and 23.

1.3.43 Figures for typical densities of reptiles in good and exceptional habitats in the UK (from two recognised sources) are detailed in **Table 1.10**.

Table 1.10: Density estimates for reptile species in the UK.

Froglife (Ref. 1.5); Foster & Gent (Ref. 1.24)[1].			
Species.	**Low Population.**	**Good Population.**	**Exceptional Population.**
Slow-worm.	<5	5–20	>20
Common lizard.	<5	5–20	>20
Adder.	<5	5–10	>10
Grass snake.	<5	5–10	>10
Species.	**Source of Information.**	**Species.**	**Simplified Estimate.**
	Beebee and Griffiths (Ref. 1.25).	**RAUK (Ref. 1.26).**	
Common lizard.	Good: 100/ha. Exceptional: 400–800/ha.	240/ha.	Good: 200/ha.
Slow-worm.	Good: 600/ha. Exceptional: 2100/ha.	Good: 600/ha. Exceptional: 1,000–2,000.	Good: 600/ha. Exceptional: 1,000/ha.
Adder.	Good: 1–10/ha. Exceptional: 94/ha.	20/ha.	Good: 20/ha. Exceptional: 100/ha.
Grass snake.	3/ha.	20/ha.	Good: 10/ha.

[1] Figures refer to maximum number of adults seen by observation and/or under tins (placed at a density of up to 10/ha) by one person in one day, or numbers presumed from long-term monitoring/reliable historical records.

1.3.44 **Table 1.11** presents information on the area of good habitat in the five broad habitat areas across the site, as determined from the Phase 1 habitat

survey maps and aerial photographs and the results for 2015 and 2016 surveys. The 2015 and 2016 reptile surveys were carried out in what was considered the most typical habitat types that would be affected by the proposed development.

1.3.45 The density estimates from the reptile surveys are considered to be most accurate for adder, given that the 2015 surveys were able to use statistically appropriate Capture-Mark-Recapture data for two of the donor sites (and specifically sites judged to be potentially "good" for adder). For grass snake, the Capture-Mark-Recapture data for 2015 was only statistically appropriate at one site (arable field margin), and this is a habitat judged to be not representative of good grass snake habitat.

1.3.46 The density estimates in **Table 1.11** are multiplied by the amount of good habitat in each of the five broad habitat areas, to give a population estimate for each species over the site, applying the species-specific mark-ups from the Galloper Wind Farm survey above (as these are likely to be the most representative figures to use given the proximity of the site). The estimated numbers of reptiles are:

- common lizard – 1,869;
- slow-worm – 7,441;
- adder – 1,566; and
- grass snake – 970.

Table 1.11: Population estimates for reptiles in five broad habitat areas across the site, from 2015–2016 surveys.

Broad Habitat Area.	Habitat Type.	Area (ha) of Habitat Type.	Typical Densities/ha from 2015–16 Surveys.				Estimated Numbers of Reptiles in Habitat to be Lost.			
			Common Lizard.	Slow-worm.	Adder.	Grass Snake.	Common Lizard.	Slow-worm.	Adder.	Grass Snake.
Main platform, Coronation Wood and adjacent hard standing.	Grassland/ scattered scrub.	20.1	15.7	8.6	32.0	0	316	173	643	0
	Landscape plantation.	15.7	5.0	0	1.3	0	79	0	20	0
Goose Hill/Kenton Hills complex.	Conifer plantation.	83.8	1.0	1.0	0	1.0	84	84	0	84
	Ride.	3.8	7.4	18.5	0	3.7	28	70	0	14
	Scrub.	2.8	15.0	7.0	22.4	2.0	42	20	63	6
	Clear fell (based on survey Area 5).	3.9	3.3	4.4	5.6	1.1	13	17	22	4
Northern arable fields, temporary accommodation campus area, land north of Lovers Lane and Ash Wood.	Arable margin.	5.0	0	29.2	0	25.0	0	146	0	125
Sizewell Marshes SSSI.	Goodrum's Fen.	5.9	5	16	5	2	30	94	30	12

Broad Habitat Area.	Habitat Type.	Area (ha) of Habitat Type.	Typical Densities/ha from 2015–16 Surveys.				Estimated Numbers of Reptiles in Habitat to be Lost.			
			Common Lizard.	Slow-worm.	Adder.	Grass Snake.	Common Lizard.	Slow-worm.	Adder.	Grass Snake.
Southern arable fields/acid grassland complex.	Arable margin.	2.6	0	29.2	0	25.0	0	76	0	65
	Grassland Pillbox Field[2].	7.0	4.5	7.8	0.6	1.8	32	55	4	13
	Clear fell (based on survey Area 6).	1.3	0.9	7.3	0.9	0.9	1	9	1	1
Total.		**152**					**623**	**744**	**783**	**323**
Total with mark up.							**1,869**	**7,441**	**1,566**	**970**

[2] Surveys undertaken within Coronation Wood (and adjacent habitats) and Pillbox Field were unsuitable for use in the calculation of typical densities and the estimated number of reptiles present within this habitat. Therefore, data from reptile translocations undertaken for the Galloper Wind Farm Eastern Super Grid Transformer Project (Ref. 13A6.19, Ref. 13A6.20) was used for these calculations.

1.4 Baseline conditions – reptile features and their importance

a) Introduction

1.4.1 This section describes the reptile baseline and assigns an ecological value to each of the reptile features identified. This assessment is then used, in conjunction with a description of the extent and magnitude of the predicted impacts of the scheme, to carry out the detailed EcIA presented in **Volume 2, Chapter 14** of the **ES**.

1.4.2 To comply with both the CIEEM Guidelines for EcIA (Ref. 1.4) and with the standard EIA methodology used elsewhere within the **ES**, both methodologies have been used to assess the reptiles within the ZOI. Full details of both assessment methodologies are presented in **Volume 1, Chapter 6** and **Appendix 14A1** – Introduction to the Ecological Baseline.

1.4.3 In addition, the reptile assemblage as a whole is assessed in relation to Key Reptile Site status (i.e. separately from the CIEEM IEF assessment process).

1.5 Description and assessment of ecological features

1.5.1 Surveys carried out by Wood Group recorded regular observations of all four common reptile species (adder, grass snake, common lizard and slow-worm) including adults, sub-adults and juveniles. It was observed that species distribution varied for both common lizard (recorded more frequently within the mosaic of scrub and rough grassland to the north of Sizewell B power station) and slow-worm (recorded more frequently within the rides and clearings of the mixed coniferous woodland plantations of Kenton Hills and Goose Hill/Dunwich Forest), but no clear habitat preference was identified for adder or grass snake. Based on Froglife criteria (Ref. 1.5), there was: a “good” population size of common lizard; an “exceptional” population size of slow-worm; an “exceptional” population size of adder; and a “good” population size of grass snake.

1.5.2 Further surveys carried out by Arcadis involved surveys of all representative habitats suitable for reptiles, notably arable hedgerow margin, conifer plantation, ride, scrub, the part of Sizewell Marshes SSSI to be lost to the development (Goodrums Fen), open grassland/scrub habitat on the main platform, and landscape plantation on the main platform. Within the site, mean population density estimates were calculated as follows: slow-worm 12.1 per ha, common lizard 6.0 per ha, adder 9.3 per ha, and grass snake 6.1 per ha.

1.5.3 Estimating reptile populations for a given area is far from simple, and considerable caution should be exercised when interpreting these figures. In the following assessments, the uncertainty has been reduced as far as

possible by using the range of methodologies to estimate reptile population densities outlined in **section 3**.

1.5.4 Each reptile species has slightly different habitat and prey preferences, and these are outlined in **Table 1.12** as this information is relevant to the following assessments of the importance of the EDF Energy Estate for reptiles. All species favour edge habitat (i.e. the interface between shorter and longer vegetation), as this provides basking sites in close proximity to the safety provided by cover. Each reptile species is evaluated below.

Table 1.12: Species-specific habitat requirements (after Edgar *et al.* (Ref. 1.23)) and how these are met within and adjacent to the site.

Species	Habitat Requirement.	Diet	Good Habitat in and Next to Site.
Common lizard.	Sunny areas with structurally-diverse vegetation cover (particularly a range of heights of vegetation). Abundant grass tussocks provide food, shelter, basking, and hibernation sites.	A range of soft-bodied invertebrate prey.	Scrub habitat at Goose Hill and open grassland/scrub habitat on the main platform. Coastal scrub and heath habitat.
Slow-worm.	Tolerate a broader range of habitats than other lizard species. Require dense vegetation (especially grasses) with sunny areas for basking and loose soil to burrow in.	Soft-bodied invertebrates, especially slugs and worms.	Arable hedgerow margin, Goose Hill ride habitat, open grassland/scrub habitat on the main platform and the Goose Hill scrub habitat. Coastal scrub and heath habitat.
Adder.	Dry, open sunny areas with adjacent dense ground cover. Hibernation sites tend to be south-facing slopes, tree root systems, crevices in banks, and voids in piled materials.	Small mammals, especially voles, along with lizards, nestling birds and frogs.	Scrub margins to Goose Hill and the open grassland within the main platform. Good connectivity with RSPB Minsmere Reserve.
Grass snake.	Often associated with wetlands. Some cover and a degree of structural diversity, but, due to its mobility, is not reliant on a single site providing the necessary habitat for hibernation, feeding and egg-laying. Sunny areas are preferred, but woodland and other shaded habitats are also used. Warm, humid, decomposing organic material is required for egg-laying.	Primarily amphibians, but also fish, small mammals and fledgling birds.	Arable field margins. Wetland habitat. Good connectivity with RSPB Minsmere Reserve.

a) Feature: adder

i. Description

1.5.5 Adder in Suffolk is distributed along the coast and in the north-west of the county (Ref. 1.27). This species is considered to be particularly common on the Sandlings Heath, the fragmented heathland of 2,000ha along the Suffolk coast from Ipswich to Southwold. According to the Agricultural Development and Advisory Service (Ref. 1.28), this area is a national stronghold for adder, and is of at least regional-level importance given the geographical continuity and size of the population.

1.5.6 Although there have been declines in the populations of all four common reptile species in the UK in the last few decades, primarily as a result of habitat loss, declines have been more severe in adder populations. Adder is more restricted in habitat preferences, and thus more vulnerable to human-induced habitat changes (Ref. 1.24).

1.5.7 English Nature (Ref. 1.29) reported evidence of declines in the status nationally of adder populations, particularly in the Midlands. A third of adder populations recorded consisted of fewer than ten adults, and a third of sites were considered isolated.

1.5.8 The National Amphibian and Reptile Recording Scheme results (Ref. 1.30) recorded adder in only 7% of sample plots studied, and concluded it was the rarest of the widespread reptile species. Historically, the reasons for this apparent decline may have been due largely to persecution, whereas habitat isolation and loss are likely to be more significant in recent times.

1.5.9 According to SWT, the major threat to adder is habitat loss and fragmentation (Ref. 1.31). The adders' habitat needs are complex; areas are needed for basking, feeding and mating. Cover from predators and good hibernation sites are also critical to survival. Adder is often restricted to habitat islands, and inbreeding can make this species genetically vulnerable to environmental change and disease, so linking habitat is crucial to its conservation.

1.5.10 A review of the Suffolk BAP (Ref. 1.3) and Suffolk's Priority Species and Habitats list (Ref. 1.6) identified adder as a priority species. In addition, adder is listed under Section 41 of the NERC Act.

ii. Assessment

1.5.11 Given that the adder:

- is legally protected;
- is listed under Suffolk's Priority Species and Habitats list (Ref. 1.6) and Section 41 of the NERC Act;
- is under threat in the UK, particularly from habitat loss and isolation of populations, and that populations in the UK are declining;
- has a population stronghold in the Suffolk coastal habitat (including the EDF Energy Estate), and has good quality habitat within parts of the EDF Energy Estate;
- has population estimates classified as either "good" or "exceptional" on the EDF Energy Estate;

then the population of this species located within the ZOI would be:

- an IEF at the regional level under the CIEEM guidelines (Ref. 1.4); and
- of medium importance following the EIA-specific assessment methodology.

1.5.12 However, as the reptile assemblage as a whole is also considered to be an IEF (see **section 1.1d)**), to avoid "double counting" it is the reptile assemblage rather than the adder as an individual species that is taken forward as the IEF in the detailed impact assessment.

b) Feature: grass snake

i. Description

1.5.13 Lack of systematic monitoring and high mobility make it difficult to determine the conservation status of grass snake. This species is still relatively abundant in some parts of Britain, but there have been severe declines in other areas, notably where egg-laying and foraging sites have disappeared (Ref. 1.24). National Amphibian and Reptile Recording Scheme survey results (Ref. 1.30) recorded grass snake in 22% of sample plots studied.

1.5.14 According to SWT, the loss of grassland and wetland habitats through human activity threatens the survival of reptiles including grass snake (Ref. 1.32).

1.5.15 A review of the Suffolk BAP (Ref. 1.3) and Suffolk's Priority Species and Habitats list (Ref. 1.6) identified grass snake as a priority species. In addition, grass snake is listed under Section 41 of the NERC Act.

ii. Assessment

1.5.16 Given that the grass snake:

- is legally protected;
- is listed under Suffolk's Priority Species and Habitats list (Ref. 1.6) and Section 41 of the NERC Act;
- is still relatively abundant (and less threatened than adder populations) in the UK;
- has good quality habitat available to it within the EDF Energy Estate;
- has population estimates classified as "good" on the EDF Energy Estate;

then the population of this species located within the ZOI would be:

- an IEF at the county level under the CIEEM guidelines (Ref. 1.4); and
- of medium importance following the EIA-specific assessment methodology.

1.5.17 However, as the reptile assemblage as a whole is also considered to be an IEF (see **section 1.1d)**), to avoid "double counting" it is the reptile assemblage rather than the grass snake as an individual species that is taken forward as the IEF in the detailed impact assessment.

c) Feature: lizard (common lizard and slow-worm)

i. Description

1.5.18 Common lizard and slow-worm are frequently recorded in Suffolk and are distributed along the coast and county boundaries (Ref. 1.29). Slow-worm is also widely distributed in England, Scotland and Wales (Ref. 1.24); however, populations tend to be smaller and more patchily distributed in the north, and this species is most abundant in southern England. Slow-worm is the most common reptile in the British Isles, although, like all species, it has suffered declines in recent decades due to loss of suitable habitat. According to SWT, slow-worm, along with all other species of reptile, has declined, largely as a result of habitat loss (Ref. 1.33).

1.5.19 The National Amphibian and Reptile Recording Scheme results (Ref. 1.30) recorded common lizard in 35% of sample plots studied, and slow-worm in 22% of sample plots.

1.5.20 A review of the Suffolk BAP (Ref. 1.3) and Suffolk's Priority Species and Habitats list (Ref. 1.6) identified common lizard and slow-worm as priority species. In addition, both are included within Section 41 of the NERC Act (Ref. 1.2).

ii. Assessment

1.5.21 Given that the common lizard and slow-worm:

- have limited legal protection;
- are listed under Suffolk's Priority Species and Habitats list (Ref. 1.6) and Section 41 of the NERC Act;
- have good quality habitat available to them within parts of the EDF Energy Estate;
- have population estimates classified as "good" for common lizard and "good/exceptional" for slow-worm on the EDF Energy Estate; but
- are the two most common reptile species in the UK (with common lizard especially common and widespread in the Suffolk coastal habitat);

then the population of these two species located within the ZOI would be.

- an IEF at the local level under the CIEEM guidelines (Ref. 1.4); and
- of low importance following the EIA-specific assessment methodology.

1.5.22 However, as the reptile assemblage as a whole is also considered to be an IEF (see **section 1.1d)**), to avoid "double counting" it is the reptile assemblage rather than the common lizard and slow-worm as individual species that are taken forward as the IEF in the detailed impact assessment.

d) Feature: reptile assemblage as a whole

1.5.23 Froglife (Ref. 1.5) present criteria for assessment of a Key Reptile Site. To qualify, the site in question must meet at least one of the following criteria:

- supports three or more reptile species;
- supports two snake species;

- supports an exceptional population of one species;
- supports an assemblage of species scoring at least 4; and
- does not satisfy the previous criteria but which is of particular regional importance due to local rarity.

1.5.24 The site and its ZOI would constitute a Key Reptile Site as it fulfils all of the first four criteria (see **Table 1.13**).

Table 1.13: Assessment of a Key Reptile Site based on Wood Group and Arcadis data.

Species.	Wood Group Data.		Arcadis Data.	
	Population Assessment.	Score.	Density/ha.	Score.
Adder.	Exceptional	3	9.3	2
Grass snake.	Good	2	6.1	2
Common lizard.	Good	2	6.0	2
Slow-worm.	Exceptional	3	12.1	2
Total score.		**10**		**8**

1.5.25 The Suffolk amphibian and reptile atlas (Ref. 1.27) states that the Brecks and Sandlings areas of Suffolk contain large tracts of important reptile habitat, which is becoming increasingly scarce in lowland Britain.

1.5.26 Therefore, the reptile assemblage as a whole would be:

- an IEF at the regional level under the CIEEM guidelines (Ref. 1.4); and
- of medium importance following the EIA-specific assessment methodology.

1.6 Summary of ecological features/receptors

1.6.1 Following a review of the known baseline within the ZOI, **Table 1.14** lists the ecological features/receptors and identifies which will be carried forward into the detailed assessment. Those carried forward are IEFs of sufficient conservation value that will be sufficiently affected by the proposed development to be a material consideration in the planning determination.

Table 1.14: Summary of reptile IEFs describing to be taken forward for detailed assessment.

Feature/ Receptor.	Importance (CIEEM/EIA Methodology).	Justification.	Scope In/Out.
Reptile assemblage.	Regional/medium.	All four species of reptile recorded on the site and within its ZOI (adder, common lizard, grass snake and slow-worm) have population assessments of "good" or "exceptional" on the site and this reptile assemblage constitute a Key Reptile Site. All four native widespread reptile species have experienced declines during recent decades, primarily due to habtiat loss and fragmentation, and the Sandlings area of Suffolk contain large tracts of important reptile habitat, which is becoming increasingly scarce in lowland Britain. The reptile assemblage within the ZOI would be suceptable to habitat loss and incidental mortality. Four native reptile species (adder, common lizard, grass snake and slow-worm) are recorded as priority species on Suffolk's Priority Species and Habitats list (Ref. 1.6) and as species of principal importance Section 41 of the NERC Act. The reptile assemblage has therefore been scoped into the detailed assessment.	Scoped in.

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SIZEWELL C DEVELOPMENT – MAIN DEVELOPMENT SITE: VOLUME 2, CHAPTER 14, APPENDIX 14A6 – REPTILES

Documents included within this Appendix are as follows:

ANNEX 14A6.1 FIGURES (provided separately)

ANNEX 14A6.2 DESK STUDY

ANNEX 14A6.3 SECONDARY DATA

- Annex 14A6.3 Amec 2012 Sizewell C New Nuclear Power Station: Terrestrial and Freshwater Ecology, and Ornithology. Reptile Survey Report 2007
- Annex 14A6.3 Amec 2012 Sizewell C New Nuclear Power Station: Terrestrial and Freshwater Ecology, and Ornithology: Coronation Wood Reptile Survey Report 2012.
- Annex 14A6.3 Entec 2008 Sizewell Power Station ISFSI and Car Park Extension Reptile Survey Report 2008.
- Annex 14A6.3 Entec 2010 Aldhurst Farm Reptile Survey Report 2010

ANNEX 14A6.4 PRIMARY DATA

VOLUME 2, CHAPTER 14: APPENDIX 14A6 – REPTILES: ANNEX 14A6.2 DESK-STUDY

Contents

Tables

Plates

None provided.

Figures

None provided.

1. Desk Study Results for Reptiles

1.1.1 Records for reptiles were requested from Suffolk Biodiversity Information Service (SBIS) in 2014 and 2018 for protected or otherwise notable species of conservation concern within 2km of the Sizewell C power station at the main development site (referred to throughout this volume as the "proposed development"). Records collected by the Suffolk Amphibian and Reptile Group and Suffolk Wildlife Trust (SWT) are provided to SBIS.

1.1.2 The locations of all designated sites (statutory and non-statutory) within 2km of the proposed development site were also obtained. Citations for these sites, which provide information on the reasons for their designation, were reviewed to ascertain whether or not reptiles are cited as interest features of these sites.

1.1.3 The Suffolk Biodiversity Action Plan (BAP) (1.1), Suffolk's Priority Species and Habitats list (1.2), and the habitats and species of principal importance included on the Section 41 list of the Natural Environment and Communities (NERC) Act (1.3), were also reviewed with reference to any amphibians present, or likely to be present, within the proposed development site and the wider study area.

1.1.4 The following table presents the desk-study results for reptiles.

Table 1.1: Desk study results for reptiles.

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Slow-worm (*Anguis fragilis*)	Thorpeness		TM47676039	1.623642814	52.18563553	2016	
Slow-worm	Dunwich		TM4767	1.618684587	52.24525069	2015	
Slow-worm	Leiston	Sandy Lane	TM461633	1.602835246	52.2124515	2012	
Slow-worm	Sizewell	Sizewell dunes	TM475625	1.622701889	52.20464584	2013	1 Count
Slow-worm	Leiston		TM447618	1.581299375	52.1996141	2012	7 Count
Slow-worm	Leiston	Sandy Lane	TM460632	1.601301747	52.21159878	2012	
Slow-worm	Leiston	Sandy Lane	TM462633	1.60429608	52.21240684	2012	
Slow-worm	Sizewell		TM475624	1.622628819	52.20374849	2012	
Slow-worm	Leiston	Field off Sandy Lane	TM461632	1.602762556	52.21155413	2011	
Slow-worm	Sizewell	Ivy Cottages	TM472619	1.617882395	52.19939634	2010	
Slow-worm	Minsmere B. R.	Compt 46: East Scrape (Centroid) path to east hide	TM475667	1.625774263	52.24233412	2009	
Slow-worm	Minsmere B. R.	Compt 55 (Centroid)	TM467670	1.614298906	52.24538522	2009	
Slow-worm	Minsmere B. R.	Minsmere Meadow Marsh Compt 40	TM446674	1.583887777	52.24991184	2008	
Slow-worm	Minsmere B. R.	Minsmere, Compt 47 West Scrape centroid	TM474667	1.624312481	52.24237906	2006	
Slow-worm	Dower House	Dower House	TM475619	1.62226353	52.19926177	2005	
Slow-worm	Minsmere B. R.	Minsmere	TM4667	1.604065517	52.24569848	2005	

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Slow-worm	Aldringham-cum-Thorpe		TM4460	1.569780401	52.18377115	2002	
Slow-worm	Eastbridge		TM4566	1.588721161	52.23717073	2001	1 Count
Slow-worm	Aldringham Common and Walks/Thorpeness Golf Course	The Walks	TM470612	1.6144514	52.1932045	1999	Present Count of adult
Slow-worm	Sizewell	Barley Rise	TM459624	1.599260024	52.20446447	1999	1 Count of adult
Slow-worm	Aldringham Common and Walks/Thorpeness Golf Course		TM468613	1.611603837	52.19419139	1998	1 Count of present
Slow-worm	Aldringham Common and Walks/Thorpeness Golf Course		TM4661	1.599704185	52.19185671	1998	
Slow-worm	Sizewell	Garden/heath	TM463623	1.605029601	52.20338854	1994	
Grass snake (*Natrix helvetica helvetica*)	Minsmere B. R.	Minsmere RSPB	TM4690866875	1.617248314	52.24417029	2017	
Grass snake	Dunwich		TM4767	1.618684587	52.24525069	2015	
Grass snake	Minsmere B. R.	Compt 55 (Centroid)	TM467670	1.614298906	52.24538522	2011	
Grass snake	Minsmere B. R.	Compt 57 (Centroid)	TM462672	1.607135094	52.24740377	2010	
Grass snake	Thorpeness	Ness House	TM476613	1.623285504	52.19383281	2010	
Grass snake	Leiston	Sandy Lane	TM463633	1.605756911	52.21236216	2012	
Grass snake	Eastbridge	4 Lyndon Cottages,	TM451661	1.590255332	52.2380236	2012	

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
		Cemetery Lane					
Grass snake	Leiston		TM447618	1.581299375	52.1996141	2012	1 Count
Grass snake	Sizewell	Ivy Cottages	TM472619	1.617882395	52.19939634	2011	
Grass snake	Minsmere B. R.	Compt 59: The Dunes (Centroid)	TM476653	1.626210754	52.22972646	2011	
Grass snake	Leiston	Sandy Lane/Rookyard Wood Con. Area	TM464633	1.607217738	52.21231746	2011	
Grass snake	Minsmere B. R.	Compt 87: 1st Fen Marsh (Centroid)	TM465659	1.610572879	52.23560396	2011	
Grass snake	Leiston	Field off Sandy Lane	TM461632	1.602762556	52.21155413	2011	
Grass snake	Aldringham-cum-Thorpe	Near Aldringham Church	TM452603	1.587516444	52.18593128	2011	
Grass snake	Leiston	Wood Farm, Westward Ho	TM437631	1.56763011	52.21172317	2011	
Grass snake	Leiston	Near Ash Wood	TM461653	1.604289838	52.23039871	2011	
Grass snake	Leiston	Garden of The Long House IP16 4DX	TM443619	1.575529653	52.20068886	2011	
Grass snake	Minsmere B. R.	The Scrape: Compts 46-48 (Centroid)	TM475666	1.625701033	52.24143678	2011	
Grass snake	Minsmere B. R.	Compts 1-107 (Centroid): Whole Reserve 06/2004 to pres	TM460672	1.604211132	52.24749319	2010	
Grass snake	Minsmere B. R.	Compt 95: Whinny Hill Skirts (Centroid)	TM469654	1.616054105	52.23093803	2010	

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Grass snake	Minsmere B. R.	Compt 40: Meadow Marsh (Centroid)	TM446674	1.583887777	52.24991184	2010	
Grass snake	Sizewell	Reckham Pits Wood/Rookyard Wood	TM462633	1.60429608	52.21240684	2010	
Grass snake	Minsmere B. R.	Bird Reserve Scrape area	TM475665	1.625627806	52.24053945	2010	
Grass snake	Eastbridge	Minsmere New Cut west of bridge	TM452664	1.591934645	52.24067119	2010	
Grass snake	Leiston	50 King George's Avenue	TM450625	1.586186985	52.20576255	2010	
Grass snake	Minsmere B. R.	Compt 54: South Belt (Centroid)	TM470669	1.618611491	52.24435335	2010	
Grass snake	Minsmere B. R.	Compt 35 (Centroid)	TM470667	1.618465313	52.24255867	2010	
Grass snake	Theberton	Potters Street	TM446652	1.582295737	52.23016952	2010	
Grass snake	Minsmere B. R.	Minsmere, Eastbridge	TM473627	1.619926817	52.20653028	2008	
Grass snake	Minsmere B. R.	Compt 32: Island Mere (Centroid)	TM460668	1.603919918	52.24390376	2009	
Grass snake	Leiston	Victory Car Sales Forecourt, King George's Avenue	TM453625	1.590568899	52.20562914	2009	
Grass snake	Eastbridge	Minsmere New Cut west of bridge	TM453663	1.593323851	52.23972928	2009	
Grass snake	Minsmere B. R.	Compt 47: West Scrape (Centroid) behind west hide	TM474667	1.624312481	52.24237906	2009	
Grass snake	Minsmere B. R.	Compt 26 (Centroid)	TM449670	1.5879841	52.24618895	2009	

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Grass snake	Minsmere B. R.	Compt 46: East Scrape (Centroid)	TM475667	1.625774263	52.24233412	2009	
Grass snake	Minsmere B. R.	Compt 48: North Girder (Centroid)	TM476664	1.627016274	52.23959715	2009	
Grass snake	Aldringham Common and Walks/Thorpeness Golf Course	Alexander Wood, Aldringham Walks	TM463604	1.603648761	52.18633863	2009	1 Count
Grass snake	Aldringham Common and Walks/Thorpeness Golf Course	Aldringham Common	TM457613	1.595541147	52.19468255	2009	
Grass snake	Minsmere B. R.	Compt 90: Rushy Marsh (Centroid)	TM466654	1.611669822	52.23107243	2009	
Grass snake	Sizewell	Sizewell Belts	TM465636	1.608897004	52.21496481	2008	1 Count
Grass snake	Sizewell	Sizewell Belts, Sizewell	TM454638	1.592971776	52.21725049	2008	
Grass snake	Sizewell	Nr Goose Hill, Sizewell	TM466645	1.611013712	52.22299626	2008	
Grass snake	Westleton	Westleton Nr Minsmere New Cut	TM448668	1.586377236	52.24443868	2007	
Grass snake	Eastbridge	Eastbridge, Near RSPB Gravel Pit	TM449669	1.587911622	52.24529158	2006	
Grass snake	Minsmere B. R.	Minsmere, Compt 56 centroid	TM462671	1.607062226	52.24650642	2006	
Grass snake	Minsmere B. R.	Minsmere, Compt 30 centroid	TM453665	1.593469001	52.24152401	2006	

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Grass snake	Eastbridge	Dam Bridge	TM452663	1.591862102	52.23977382	2006	
Grass snake	Theberton	Birchwood Farm, Theberton	TM447652	1.583757186	52.23012511	2006	
Grass snake	Sizewell	Sizewell Belts	TM461637	1.603126042	52.21604095	2005	1 Count
Grass snake	Leiston		TM471625	1.616859664	52.20482527	2005	1 Count
Grass snake	Sizewell	Sizewell, Goose Hill	TM467647	1.612620713	52.22474619	2005	
Grass snake	Sizewell	Bank south of Sizewell A power station	TM470631	1.615836716	52.21025419	2005	
Grass snake	Minsmere B. R.	Minsmere Near Bittern Hide	TM470668	1.6185384	52.24345601	2005	
Grass snake	Minsmere B. R.	Minsmere Road near Scottshall	TM463673	1.60866997	52.24825639	2005	
Grass snake	Sizewell	Leiston Rd	TM4662	1.600430121	52.20083039	2005	
Grass snake	Minsmere B. R.	Minsmere By Sluice	TM477662	1.628331409	52.23775751	2005	
Grass snake	Sizewell	Leiston Rd	TM4762	1.615034523	52.20038332	2005	
Grass snake	Sizewell	SizewellOn accees road to Powers Stations	TM474628	1.621460481	52.20738276	2005	
Grass snake	Westleton Walks		TM452672	1.592515131	52.24785014	2001	
Grass snake	Minsmere B. R.	Minsmere West Hide	TM474668	1.624385686	52.2432764	2004	
Grass snake	Scottshall Coverts	Minsmere Scoltishall Coverts	TM462673	1.607207965	52.24830112	2004	
Grass snake	Minsmere B. R.	Minsmere Compartment 26	TM450670	1.589446066	52.24614445	2004	
Grass snake	Minsmere B. R.	Minsmere Island Mere	TM463667	1.608232621	52.24287227	2004	

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Grass snake	Minsmere B. R.	Minsmere Scrape	TM477665	1.628551242	52.24044951	2004	2 Count
Grass snake	Leiston	Kenton Hills Leiston	TM454643	1.59333435	52.22173734	2004	
Grass snake	Minsmere B. R.	Minsmere Island Mere	TM470663	1.618173001	52.23896929	2004	
Grass snake	Minsmere B. R.		TM465672	1.611521008	52.24726951	2004	
Grass snake	Leiston	Leiston, Sandy (Ropes) Lane	TM454647	1.593624477	52.22532683	2004	
Grass snake	Minsmere B. R.	Minsmere Scrape	TM477667	1.628697816	52.24224417	2003	
Grass snake	Minsmere B. R.	Near Island Mere Hide, Minsmere	TM464668	1.609767357	52.24372488	2003	
Grass snake	Minsmere B. R.	Minsmere Scrape	TM473669	1.622997049	52.24421867	2003	
Grass snake	Minsmere B. R.	Near sluice at Minsmere	TM477661	1.628258139	52.23686017	2003	
Grass snake	Minsmere B. R.	Sheepwash Lane	TM468671	1.615833844	52.24623774	2002	
Grass snake	Minsmere B. R.		TM465673	1.611593968	52.24816686	2000	1 Count of present
Grass snake	Aldringham Common and Walks/Thorpeness Golf Course	The Walks	TM470612	1.6144514	52.1932045	1999	Present Count of adult
Common lizard (*Zootoca vivipara*)	Minsmere B. R.	Minsmere RSPB	TM4776765886	1.629080581	52.23490974	2017	
Common lizard	Sizewell	Sizewell Beach	TM475626	1.622774962	52.20554318	2015	1 Count
Common lizard	Sizewell	Sizewell Beach	TM476626	1.624235537	52.20549828	2015	1 Count of female

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Common lizard	Dunwich		TM4767	1.618684587	52.24525069	2015	
Common lizard	Leiston	Allotments	TM448626	1.583337972	52.20674878	2012	
Common lizard	TM461633	Sizewell Dunes	TM476635	1.624893632	52.21357435	2013	1 Count
Common lizard	Minsmere B. R.	Minsmere Near sluice	TM4766	1.617953808	52.23627726	2013	1 Count
Common lizard	Sizewell	Sizewell Dunes	TM476637	1.625039918	52.21536904	2013	1 Count
Common lizard	Minsmere B. R.	The Scrape: Compts 46-48 (Centroid)	TM475666	1.625701033	52.24143678	2011	
Common lizard	Leiston	Wood Farm, Westward Ho	TM437631	1.56763011	52.21172317	2011	
Common lizard	Minsmere B. R.	Compt 32: Island Mere (Centroid)	TM460668	1.603919918	52.24390376	2010	
Common lizard	Sizewell	Goose Hills, Sizewell	TM473645	1.621241803	52.22268249	2012	
Common lizard	Minsmere B. R.	Minsmere Bird Reserve	TM467665	1.613933909	52.24089848	2012	
Common lizard	Sizewell	Goose Hills, Sizewell	TM472642	1.619561496	52.22003534	2012	
Common lizard	Sizewell	Goose Hills, Sizewell	TM472644	1.6197076	52.22183003	2012	
Common lizard	Sizewell	Goose Hills, Sizewell	TM472645	1.619780658	52.22272737	2012	
Common lizard	Sizewell		TM475624	1.622628819	52.20374849	2012	
Common lizard	Leiston	Allotments	TM448627	1.583410257	52.20764617	2012	
Common lizard	Leiston	Allotments	TM449626	1.58479865	52.20670437	2012	
Common lizard	Leiston	Allotments	TM449627	1.584870965	52.20760175	2012	
Common lizard	Leiston		TM447618	1.581299375	52.1996141	2012	1 Count

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Common lizard	Leiston	Off Valley Road	TM449629	1.585015607	52.20939651	2012	
Common lizard	Leiston	Allotments	TM449628	1.584943284	52.20849913	2012	
Common lizard	Leiston	Allotments	TM448625	1.58326569	52.2058514	2011	
Common lizard	Minsmere B. R.	Minsmere Levels	TM469665	1.616857406	52.24080883	2011	
Common lizard	Minsmere B. R.	Minsmere Levels	TM464665	1.609548635	52.24103282	2011	
Common lizard	Sizewell	On coastal strip	TM475626	1.622774962	52.20554318	2011	
Common lizard	Sizewell	Nr Sizewell Hall	TM476622	1.623943151	52.20190891	2011	
Common lizard	Leiston	Goose Hill	TM469646	1.615470176	52.22375925	2011	
Common lizard	Minsmere B. R.	Minsmere Reserve Bet Bitten & Island Hide	TM467669	1.614225899	52.24448787	2011	
Common lizard	Sizewell	Just off road nr Halfway Cottages	TM465624	1.608023437	52.20419652	2011	
Common lizard	Eastbridge	Near Bridge of Minsmere New Cut	TM453663	1.593323851	52.23972928	2010	
Common lizard	Thorpeness	Conservation area near Alexander Wood	TM462608	1.602479252	52.18997273	2010	
Common lizard	Leiston	Field adjacent Sandy Lane	TM461632	1.602762556	52.21155413	2010	
Common lizard	Sizewell	In front of power station at back of beach on steps N of car park	TM476639	1.625186218	52.21716372	2010	
Common lizard	Minsmere B. R.	Lowered areas: Compts 31,35,36,38,39 (Centroid)	TM471667	1.61992711	52.24251379	2010	

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Common lizard	Sizewell	Ivy Cottages	TM472619	1.617882395	52.19939634	2010	
Common lizard	Thorpeness	Ness House	TM476613	1.623285504	52.19383281	2010	
Common lizard	Minsmere B. R.	Compt 48: North Girder (Centroid)	TM476664	1.627016274	52.23959715	2009	
Common lizard	Leiston	Allotments between King George's Avenue & Valley Road, Leiston	TM450626	1.586259325	52.20665993	2008	
Common lizard	Sizewell	Sizewell Belts, Sizewell	TM475628	1.622921119	52.20733787	2008	
Common lizard	Minsmere B. R.	Minsmere South Belts Crossroads near Bottern Hide Compt 54	TM471669	1.620073348	52.24430847	2008	
Common lizard	Minsmere B. R.	Minsmere Compt 55, boundary compts 16 & 17	TM467670	1.614298906	52.24538522	2008	
Common lizard	Leiston	Grimseys Lane	TM459621	1.599042245	52.20177236	2008	
Common lizard	Leiston	Valley Road Conservation Area	TM450629	1.586476369	52.20935207	2007	
Common lizard	Sizewell	Sizewell Outside the Tea Rooms	TM476628	1.624381754	52.20729296	2005	
Common lizard	Dower House	Dower House	TM475619	1.62226353	52.19926177	2005	
Common lizard	Minsmere B. R.	Minsmere Dunes	TM478665	1.630012954	52.24040451	2005	
Common lizard	Aldringham Common and Walks/Thorpeness Golf Course	Aldringham Common atNW corner of Alexander Wood	TM462607	1.602406628	52.18907537	2005	

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Common lizard	Minsmere B. R.	Minsmere East Hide	TM458665	1.600777982	52.24130102	2004	
Common lizard	Sizewell	Lane south of Sizewell	TM474617	1.620657125	52.19751195	2003	
Common lizard	Minsmere B. R.	Sheepwash Lane	TM468671	1.615833844	52.24623774	2002	
Common lizard	Minsmere B. R.	Minsmere	TM477664	1.62847796	52.23955217	2002	
Common lizard	North Warren	Alexander Wood	TM463605	1.603721403	52.18723599	2002	
Common lizard	Aldringham-cum-Thorpe		TM4460	1.569780401	52.18377115	2002	
Common lizard	Eastbridge		TM4566	1.588721161	52.23717073	2001	0 Count
Common lizard	Leiston	Leiston/Saxmund	TM428631	1.554482138	52.21212039	1999	1 Count of female
Common lizard	Aldringham Common and Walks/Thorpeness Golf Course	The Walks	TM470612	1.6144514	52.1932045	1999	Present Count of adult
Common lizard	Aldringham Common and Walks/Thorpeness Golf Course		TM468613	1.611603837	52.19419139	1998	10 Count of juvenile
Common lizard	Aldringham Common and Walks/Thorpeness Golf Course	Aldringham Walks	TM460608	1.599559044	52.19006197	1997	3 Count of present
Common lizard	Sizewell	garden/heath	TM463623	1.605029601	52.20338854	1994	
Common lizard	Sizewell	garden	TM458625	1.597872013	52.20540643	1994	
Adder (*Vipera berus*)	Minsmere B. R.	Minsmere RSPB reserve	TM4766	1.617953808	52.23627726	2017	
Adder	Minsmere B. R.	Minsmere East hide, Leiston	TM47696671	1.628558968	52.2423384	2017	3 Count

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Adder	Sizewell		TM4556564066	1.595575443	52.21956398	2017	
Adder	Minsmere B. R.	Minsmere	TM4767	1.618684587	52.24525069	2017	
Adder	Minsmere B. R.	Minsmere	TM477661	1.628258139	52.23686017	2016	
Adder	Leiston	Sandling SPA	TM4632262249	1.605313832	52.20292106	2016	
Adder	Sizewell		TM476645	1.625625213	52.22254775	2016	
Adder	Minsmere B. R.	RSPB Minsmere	TM472669	1.621535201	52.24426358	2015	
Adder	Sizewell	Sizewell Beach	TM476626	1.624235537	52.20549828	2015	1 Count of Male
Adder	Minsmere B. R.	Minsmere	TM468668	1.615614734	52.2435457	2015	3 Count
Adder	Sizewell	Sizewell dunes	TM475625	1.622701889	52.20464584	2013	1 Count
Adder	Minsmere B. R.	RSPB Minsmere	TM4669366969	1.614173941	52.24511018	2013	Four Count of Male
Adder	Sizewell	Kenton Hills, Sizewell	TM459640	1.600422088	52.21882232	2012	
Adder	Leiston	Goose Hills, Sizewell	TM475630	1.623067293	52.20913256	2012	
Adder	Leiston	Kenton Hills	TM474640	1.622337398	52.21815089	2012	
Adder	Leiston	Sizewell (car-park)	TM470644	1.616785359	52.22191973	2012	
Adder	Sizewell	Reckham Wood Pits	TM463636	1.605975178	52.21505423	2011	
Adder	Aldringham-cum-Thorpe	Near Aldringham Church	TM452603	1.587516444	52.18593128	2011	
Adder	Minsmere B. R.	Near Bittern Hide	TM465670	1.6113751	52.24547481	2011	
Adder	Leiston	Ashfield Drive	TM442620	1.57414124	52.20163056	2011	

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Adder	Leiston	Goose Hill	TM468646	1.614008987	52.22380405	2011	
Adder	Sizewell	Ivy Cottages	TM472619	1.617882395	52.19939634	2011	
Adder	Minsmere B. R.	Bird Reserve north of Scrape	TM467670	1.614298906	52.24538522	2011	
Adder	Sizewell	On coastal strip	TM475626	1.622774962	52.20554318	2011	
Adder	Minsmere B. R.	Minsmere Reserve Bet Bitten & Island Hide	TM467669	1.614225899	52.24448787	2011	
Adder	Minsmere B. R.	Compt 57 (Centroid)	TM462672	1.607135094	52.24740377	2011	
Adder	Sizewell	Nr Sizewell Hall	TM474623	1.621095262	52.20289603	2011	
Adder	Minsmere B. R.	Compt 46: East Scrape (Centroid)	TM475667	1.625774263	52.24233412	2011	
Adder	Minsmere B. R.	Compt 40: Meadow Marsh (Centroid)	TM446674	1.583887777	52.24991184	2011	
Adder	Sizewell	Sizewell Beach Strip	TM476633	1.624747362	52.21177967	2011	
Adder	Sizewell	Reckham Wood Pits	TM465636	1.608897004	52.21496481	2011	
Adder	Leiston	Goose Hill	TM472645	1.619780658	52.22272737	2011	
Adder	Leiston	Goose Hill	TM471645	1.61831951	52.22277223	2011	
Adder	Leiston	Goose Hill	TM470645	1.616858358	52.22281707	2011	
Adder	Sizewell	Coastal Strip	TM476635	1.624893632	52.21357435	2011	
Adder	Leiston	Sandy Lane/Rookyard Wood Con. Area	TM464633	1.607217738	52.21231746	2011	

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Adder	Minsmere B. R.	Compt 47: West Scrape (Centroid)	TM474667	1.624312481	52.24237906	2010	
Adder	Minsmere B. R.	Compt 48: North Girder (Centroid)	TM476664	1.627016274	52.23959715	2010	
Adder	Minsmere B. R.	Compt 49 (Centroid)	TM477666	1.628624527	52.24134684	2010	
Adder	Leiston	Sandy Lane	TM459632	1.599840934	52.2116434	2010	
Adder	Sizewell	Beach in front of power station	TM476634	1.624820495	52.21267701	2010	
Adder	Minsmere B. R.	Compt 95: Whinny Hill Skirts (Centroid)	TM469654	1.616054105	52.23093803	2010	
Adder	Minsmere B. R.	Compt 58: The Sluice (Centroid)	TM477660	1.628184873	52.23596284	2010	
Adder	Minsmere B. R.	Compt 59: The Dunes (Centroid)	TM476653	1.626210754	52.22972646	2010	
Adder	Minsmere B. R.	Compt 32: Island Mere (Centroid)	TM460668	1.603919918	52.24390376	2010	
Adder	Minsmere B. R.	Compts 1-107 (Centroid): Whole Reserve 06/2004 to pres	TM460672	1.604211132	52.24749319	2010	
Adder	Minsmere B. R.	Compt 54: South Belt (Centroid)	TM470669	1.618611491	52.24435335	2010	
Adder	Minsmere B. R.	Minsmere Bird Reserve	TM466671	1.612909986	52.24632737	2010	
Adder	Minsmere B. R.	Compts 31,35,36,38,39	TM471667	1.61992711	52.24251379	2010	

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
		(Centroid)					
Adder	Aldringham Common and Walks/Thorpeness Golf Course	Margaret Wood, Aldringham Walks	TM466607	1.608246881	52.18889669	2009	1 Count
Adder	Aldringham Common and Walks/Thorpeness Golf Course	Aldringham Walks	TM462610	1.60262451	52.19176747	2009	
Adder	Eastbridge	Minsmere New Cut west of bridge	TM452663	1.591862102	52.23977382	2009	
Adder	Aldringham Common and Walks/Thorpeness Golf Course	Square Covert, Aldringham Walks	TM464616	1.605981039	52.19706233	2009	1 Count
Adder	Minsmere B. R.	Compt 33 (Centroid)	TM466667	1.612618083	52.24273798	2009	
Adder	Leiston	By footpath near Round House	TM455651	1.595376055	52.22887174	2009	
Adder	Minsmere B. R.	Minsmere Beach Bridleway Compts 49 & 59	TM477665	1.628551242	52.24044951	2008	
Adder	Minsmere B. R.	Minsmere in Scrape, Eastbridge	TM476667	1.627236042	52.24228915	2008	
Adder	Sizewell	Nr Goose Hill, Sizewell	TM466645	1.611013712	52.22299626	2008	
Adder	Eastbridge	Eastbridge RSPB Quarry	TM448670	1.58652213	52.24623343	2007	
Adder	Aldringham Common and Walks/Thorpeness Golf Course	Aldringham Walks	TM462611	1.602697145	52.19266483	2007	

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
Adder	Eastbridge	Eastbridge RSPB Quarry	TM448669	1.586449681	52.24533606	2007	
Adder	Minsmere B. R.	Minsmere, Compt 97 Great Marsh centroid	TM473655	1.621972887	52.23165591	2006	
Adder	Aldringham-cum-Thorpe	Aldringham	TM461610	1.60116435	52.1918121	2005	
Adder	Sizewell	Sizewell, Track, possibly Sandy Lane	TM466635	1.610285064	52.21402272	2005	
Adder	Minsmere B. R.	Minsmere, Compt 46-48 centroid The Scrape	TM475666	1.625701033	52.24143678	2006	
Adder	Minsmere B. R.	Minsmere, Compt 26 centroid	TM449670	1.5879841	52.24618895	2006	
Adder	Eastbridge	Eastbridge, RSPB Quarry	TM449669	1.587911622	52.24529158	2006	
Adder	Dower House	Dower House	TM475619	1.62226353	52.19926177	2005	
Adder	Sizewell	Sizewell Beach and dunes	TM4762	1.615034523	52.20038332	2005	
Adder	Aldringham-cum-Thorpe	Aldringham, Track east of Church Lane	TM457605	1.594961283	52.18750356	2005	
Adder	Minsmere B. R.	Minsmere Compartment 55	TM465672	1.611521008	52.24726951	2005	
Adder	Aldringham-cum-Thorpe	Aldringham, Church Lane	TM453605	1.589121128	52.18768158	2005	
Adder	Minsmere B. R.	Minsmere, East Walks Lane	TM462673	1.607207965	52.24830112	2004	
Adder	Minsmere B. R.	Minsmere, Island Mere path	TM463669	1.608378389	52.24466698	2004	
Adder	Minsmere B. R.	Minsmere, Sluice	TM478661	1.629719734	52.23681518	2004	
Adder	Aldringham Common and Walks/Thorpeness Golf	Thorpeness Common	TM460606	1.599413917	52.18826723	2004	

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
	Course						
Adder	Minsmere B. R.	Minsmere, Bitten Hide	TM469668	1.617076569	52.24350087	2004	
Adder	Minsmere B. R.	Minsmere, Whin Hill	TM467672	1.614444932	52.24717991	2004	
Adder	Westleton Walks	Westleton Walks	TM458675	1.601505428	52.25027461	2003	
Adder	Aldringham Common and Walks/Thorpeness Golf Course	Aldringham Common, near tumulus	TM455604	1.591968806	52.18669523	2003	
Adder	Minsmere B. R.	Near Island Mere Hide, Minsmere	TM464668	1.609767357	52.24372488	2003	
Adder	Minsmere B. R.	Minsmere, Near workcentre	TM469670	1.617222697	52.24529555	2003	
Adder	Aldringham Common and Walks/Thorpeness Golf Course	Aldringham Common,	TM456607	1.593646135	52.18934285	2003	
Adder	Aldringham Common and Walks/Thorpeness Golf Course	Aldringham Walks	TM464615	1.605908326	52.19616497	2002	
Adder	Aldringham Common and Walks/Thorpeness Golf Course	Aldringham Walks	TM468613	1.611603837	52.19419139	2002	
Adder	Aldringham-cum-Thorpe		TM4460	1.569780401	52.18377115	2002	
Adder	Minsmere B. R.	Near East Hide	TM477667	1.628697816	52.24224417	2002	
Adder	Minsmere B. R.	Scott's Hall, Miinsmere	TM4667	1.604065517	52.24569848	1999	
Adder	Aldringham Common and	The Walks	TM470612	1.6144514	52.1932045	1999	Present

Species	Location	Site Detail	Grid Reference	Longitude	Latitude	Year	Abundance
	Walks/Thorpeness Golf Course						Count of adult
Adder	Thorpeness		TM4760	1.613577175	52.18243623	1998	
Adder	Aldringham Common and Walks/Thorpeness Golf Course		TM4661	1.599704185	52.19185671	1998	
Adder	Aldringham Common and Walks/Thorpeness Golf Course	Aldringham Walks	TM460608	1.599559044	52.19006197	1997	2 Count of present
Adder	Thorpeness		TM4761	1.614305658	52.19140979	1994	
Leathery Turtle (*Dermochelys coriacea*)	Sizewell	beach	TM476643	1.625478866	52.22075307	1998	1 Count of dead

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1.2 Suffolk Biodiversity Information Service. 2015. Priority Species and Habitats. (Online) Available from: https://www.suffolkbis.org.uk/biodiversity/speciesandhabitats (Accessed 01 February 2019).

1.3 Natural Environment and Rural Communities Act. 2006. (Online). Available from: http://www.legislation.gov.uk/ukpga/2006/16/contents (Accessed 01 March 2016).

SIZEWELL C DEVELOPMENT – MAIN DEVELOPMENT SITE: VOLUME 2, CHAPTER 14, APPENDIX 14A6 – REPTILES

Documents included within this Appendix are as follows:

ANNEX 14A6.3 SECONDARY DATA

- Annex 14A6.3 Amec 2012 Sizewell C New Nuclear Power Station: Terrestrial and Freshwater Ecology, and Ornithology. Reptile Survey Report 2007

- Annex 14A6.3 Amec 2012 Sizewell C New Nuclear Power Station: Terrestrial and Freshwater Ecology, and Ornithology: Coronation Wood Reptile Survey Report 2012.

- Annex 14A6.3 Entec 2008 Sizewell Power Station ISFSI and Car Park Extension Reptile Survey Report 2008.

- Annex 14A6.3 Entec 2010 Aldhurst Farm Reptile Survey Report 2010

EDF Energy

Sizewell C New Nuclear Power Station: Terrestrial and Freshwater Ecology, and Ornithology

Draft Reptile Survey Report 2007

June 2012

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Document Revisions

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1	Draft Report	June 2012

Contents

1. Introduction

1.1 Purpose of this Report

An area of land directly north of Sizewell B Nuclear Power Station, which is located near Leiston in Suffolk, has been identified as having the potential to accommodate the proposed development of one or more new nuclear reactors. This proposed development is known as Sizewell C. The site of the proposed development has an approximate central National Grid Reference (NGR) of TM473640.

AMEC Environment & Infrastructure UK Ltd ('AMEC') was commissioned in 2007 to provide terrestrial and freshwater ecological, and ornithological services in relation to Sizewell C. The purpose of this report, which outlines the findings of survey work undertaken for reptiles during 2007, is to inform the design of Sizewell C and the Environmental Statement for the scheme.

1.2 Survey Area and Scope

The survey area and methodologies used have been adopted following consultation with statutory and non-statutory consultees and other stakeholders, taking into account best practice guidelines, and site-specific and project-specific characteristics. The survey area adopted is precautionary in that it allows for the iterative development of the scheme design by covering a larger area than is likely to be affected by the proposals. Based on the information available at the time the survey was undertaken, it was assessed that the relevant Zones of Influence of the proposed development would be likely not to extend further than the defined study area.

2. Methods

2.1 Desk Study

Existing information regarding reptiles within the preliminary works area and surrounding land was obtained from the following sources (further detail is provided in the Sizewell Desk Study report):

- The Suffolk Wildlife Trust (SWT): this included a report by Gooch (2002);
- Suffolk Biodiversity Records Centre (SBRC);
- Cresswell Associates (2005).

2.2 Field Survey

The survey methodology followed guidance provided in Froglife's Advice Sheet 10 (Froglife, 1999) and took into account additional guidance provided by the *Herpetofauna Workers' Manual* (Gent & Gibson, 1998) and *Reptiles: guidelines for developers* (English Nature, 2004).

Artificial refugia, comprising 0.5 m x 1 m roofing felt or corrugated tin sheets, were laid out in locations considered to have the highest potential to support reptiles (although see constraints below) on 4 June 2007. When conducting survey work aimed at deriving indicative population sizes for reptiles, the Froglife guidance recommends placing 5-10 refugia per hectare (ha) of suitable habitat. Please note that this does not refer to the entire developable area but the area of habitat considered to be suitable to support reptiles. A maximum of approximately 26ha of habitat within the study area was identified as being suitable for reptiles and as such, following Froglife guidance, this would require between 130 and 260 refugia being placed within the survey area.

Taking into account the nature of the habitats on the ground cover and problems with access, a total of 163 refugia were used[1] in order to undertake the survey, thereby meeting the requirements of the Froglife guidance. The location of each refugium was recorded using a GPS. Refugia were located away from public and permissive footpaths where possible to limit the potential for interference or disturbance of reptiles. Figure 2.1 illustrates the locations of the refugia.

Twenty-six survey visits were made between June and October 2007, during which reptiles basking on, near and under the refugia were recorded. Any reptiles observed while walking across the site were also recorded. Survey effort was concentrated towards September and October when the weather for surveying reptiles is identified to be optimal by Froglife (Froglife, 1999) when temperatures are cooler compared with June, July and August, thereby making reptile sightings more frequent. Reptile activity is very dependent on the weather and

[1] Some of these were existing refugia laid previously by SWT.

time of year, therefore surveys were conducted as far as was practically possible in optimum conditions. As ectotherms, reptiles must bask in order to warm themselves and become active. April, May and September/October are key months for detecting basking reptiles, as more continuous mid-summer heat means reptiles require less basking time to become active. Successful surveys may still be carried out from June to August however, if weather conditions are suitable. Optimum conditions are intermittent sunshine with little or no wind, particularly after a spell of cooler or wetter weather. Individual species have some specific preferences although generally it is preferable to survey when the temperature is between 10 and 17°C.

The weather conditions encountered during the survey period are considered to be suitable for surveying reptile populations. Weather conditions were recorded in detail on each visit as were details of all reptiles observed, including species, age class and sex.

Approximately 10-15 refugia located along the access tracks within the plantation were destroyed as a result of forestry operations, which included the rotational felling of some forest compartments. Subsequent to this incident, maps and information relating to the location of the reptile refugia were provided to the logging contractors to avoid further disturbance of the refugia and possible harm to reptiles. The temporary loss of this small proportion of the refugie is not considered to have affected the results of the survey significantly.

2.3 Population Size Class Assessment

As per Froglife's guidelines (Froglife, 1999), the classification of the relative size of viviparous lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*), adder (*Vipera berus*) and grass snake (*Natrix natrix*) populations was assessed on the basis of maximum survey counts of adults seen by observation and/or under artificial refugia (placed at a density of up to 10 per hectare), by one person in one day. The criteria for classification of population size, based on the Froglife guidelines, are outlined in Table 2.1.

Table 2.1 Classification of the relative size of reptile populations

Species	Low population	Good population	Exceptional population
Viviparous lizard	< 5	5 – 20	> 20
Slow worm	< 5	5 – 20	> 20
Adder	< 5	5 – 10	> 10
Grass snake	< 5	5 – 10	> 10

2.4 Personnel

The survey team comprised suitably experienced ecologists led by Dyfrig Hubble.

3. Results

3.1 Desk Study

A reptile survey of Leiston Common in 2002 (Gooch, 2002) recorded adder, grass snake and slow-worm. A further presence/likely absence survey was conducted on behalf of British Energy during 2006 (ADAS & SWT, 2007) that focused on the plantation woodland habitats of Kenton and Goose Hill (20 refugia were placed): this identified frequent occurrences of grass snake with more occasional observations of slow worm and viviparous lizard. No adders were recorded during that survey. The Sizewell Land Management Report for 1997-1998 (ADAS & SWT, 1998) also includes regular sightings of adders and viviparous lizards.

Adder is a Suffolk BAP species, and is particularly common on the Sandlings heaths, which represent a national stronghold for the species (ADAS, 2006).

Data from SBRC provided in 2007 indicate that all four common reptile species are widespread throughout the Sizewell Estate and beyond. All four species have been recorded within the estate within the last 9 years with many recent records for viviparous lizard, adder and grass snake. However, only seven records exist for slow worms dating back to 1980. Extensive records of viviparous lizard, adder and grass snake exist for the land surrounding the estate, with the majority of the observations being made by Robin Harvey at the Minsmere Birds reserve located to the north. The study of aerial photography indicates that there is connective habitat suitable for reptiles between Minsmere and the study area.

3.2 Field Survey

Table 3.1 summarises the results of the survey; full survey results are presented in Appendix A.

Table 3.1 Summary of reptile survey results

Visit no.	Date	Reptile observations*			
		Viviparous lizard	Slow worm	Adder	Grass snake
1	16/06/07	2M 1F	1M 1F	1F	1(A)
2	18/06/07	5M 6F 1(A)	1F	1F	1(A)
3	05/07/07	1M 2F 1(A)	2M 2F	-	3(A) 2Juv
4	07/07/07	3M 3F 2Juv	3M 3F 2Juv	2M 1F 1 Juv	2(A)
5	08/07/07	2M 1F 2(A)	1M 8F	1M 1F	3(A)
6	10/07/07	7M 4F	4M 2F	1F	-
7	17/07/07	2M 3F 2(A)	3M 14F 3Juv	4F 7(assorted sizes & sexes)[2]	2(A) 1 Juv
8	21/07/07	1M 1(A)	4M 8F	1F 2(A)	3(A)
9	22/07/07	1F 5(A)	8M 15M 6Juv	8F 1Juv 9(A)	5(A) 4Juv
10	23/07/07	5M 2F	17M 12F 1Juv	5F 1(A)	9(A) 1 Juv
11	04/08/07	1M 2F 1Juv	10M 7F 6Juv 6(A)	1M 1F	2(A)
12	05/08/07	1F	14M 5F 1Juv	1M 1F 3Ju	2(A)
13	16/08/07	5F 7Juv 3(A)	11M 15F 13Juv	1M 3F 3Juv 8(A)	9(A) 1Juv
14	31/08/07	6M 4Juv 3(A)	15M 16F 5Juv	4M 1F 3Juv	11(A)
T15	05/09/07	2F 7Juv	4M 8F 1Juv	2M 2Juv	5(A) 4Juv
16	06/09/07	1M 10Juv	5M 8F 4Juv 4(A)	1M 2Juv	9(A) 6Juv
17	09/09/07	5F 1Juv 8(A)	8F 6F 5Juv 2(A)	2F	4(A) 7Juv
18	14/09/07	1F 3Juv 2(A)	3M 10F 1Juv	-	4(A) 2Juv
19	15/09/07	1M 1(A)	2M 4F	1F	1(A)
20	18/09/07	3M 1(A)	2M 5F	-	1(A) 1Juv
21	22/09/07	2M 1F 7Juv 1(A)	1M 2F 3Juv	2F	2A
22	23/09/07	1M 3F 4Juv 1(A)	1M 1F 2Juv	2M 3F	3(A)
23	01/10/07	2M 7F 6Juv 6(A)	1M 4F 4Juv	2F	3Juv
24	02/10/07	4F 10Juv 3(A)	3F 6Juv	1F	3(A) 1Juv
25	05/10/07	1F 1Juv	2F 1 Juv	-	1(A)
26	07/10/07	2M 6F 6Juv	1M	1F	1(A) 1Juv

* M = Male, F = Female, Juv = Juvenile, (A) = Adult but sex is unknown.

[2] In instances where it was not possible to determine either sex or age class (e.g. brief sighting, or large number of individuals grouped together), the total number of individuals was noted.

The survey identified the presence of viviparous lizard, slow worm, adder and grass snake. Regular observations were made of all four species throughout the survey period, including adults, sub-adults and juveniles.

Viviparous lizards were observed throughout the survey period. There was a clear concentration of this species in the habitats closer to the coastline, most notably within the ungrazed improved grassland swards and the coastal grassland habitats. Viviparous lizards were observed in low numbers at isolated locations within the plantation woodland of Dunwich Forest and Goose Hill but records were absent further west. This distribution is illustrated in Figure 3.1.

In contrast to the viviparous lizard distribution, large numbers of slow worms were recorded in greater densities and more frequently within the woodland habitats along ride edges. This distribution was fairly even across the plantation woodland habitats. An absence of records was apparent in more open habitats towards the coastline with only a few reptiles observed within ungrazed grassland. Slow worms were found primarily in areas close to dense scrub and/or woodland habitats that provided denser cover. This distribution is illustrated in Figure 3.2**.**

Adders were observed in both the open grassland habitats to the east of the survey area and within the plantation woodland habitats with no clear distinction between the two. There appeared to be hubs of greater densities of this species within Dunwich Forest with lower numbers elsewhere. This distribution is illustrated in Figure 3.3.

Grass snakes, although slightly more frequently recorded, exhibited a similar distribution to the adder population recorded within the survey. Grass snakes were observed throughout the survey area with a relatively even distribution although, again, there is a greater density of records in Dunwich Forest. This distribution is illustrated in Figure 3.4.

3.3 Population Size Class Assessment

The classification of the relative size of populations for each species within the survey area is summarised in Table 3.2.

Table 3.2 Reptile population size classification

Species	Maximum adult count	Population size class
Viviparous lizard	15	Good
Slow worm	31	Exceptional
Adder	17	Exceptional
Grass snake	9	Good

4. Summary

All four common reptile species were recorded within the survey area including exceptional populations of adders and slow worms, a good population of viviparous lizard and a low population of grass snake. The viviparous lizard populations identified were primarily distributed in open grassland and scrub habitats within the survey area, whereas the slow worm population was focussed within woodland edge habitats. The two snake species were fairly evenly distributed between the two habitat types.

5. References

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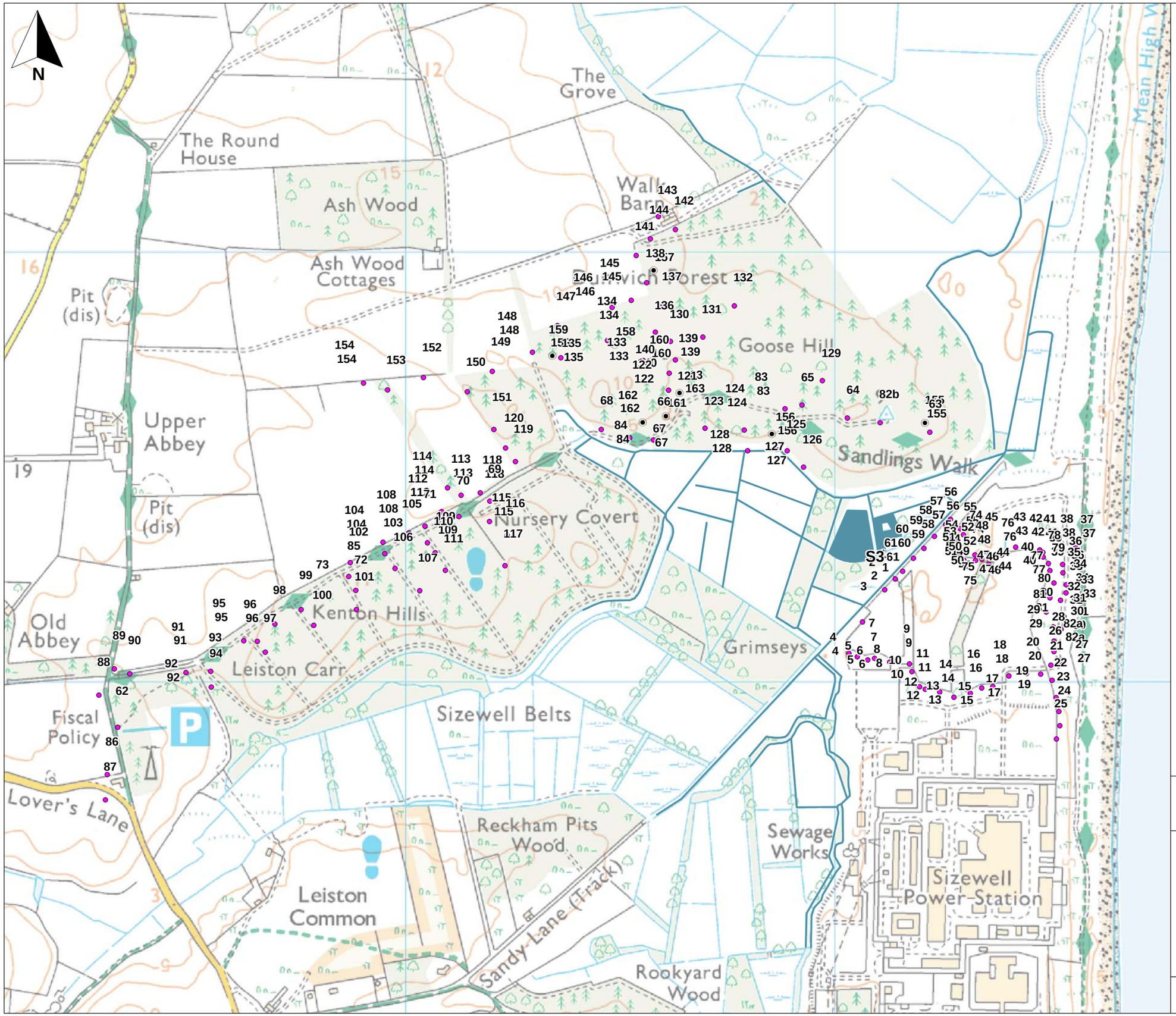
Gooch M (2002). Reptile survey of Leiston Common, Sizewell, Suffolk. Report to Suffolk Wildlife Trust.

Figures



Key

- Pond / ditch
- AMEC Refugia
- Suffolk WT refugia

0 m — 300 m

Scale 1:8500 @ A3

Sizewell Reptile Survey Report 2007

Figure 2.1
Approximate locations of reptile refugia

June 2012
28130-A426.wor tugwc

N

The Round House

The Grove

Walk Barn

Ash Wood

Ash Wood Cottages

Dunwich Forest

Goose Hill

Sandlings Walk

Mean High W

Pit (dis)

Upper Abbey

Pit (dis)

Nursery Covert

Kenton Hills

Old Abbey

Leiston Carr

Grimseys

Fiscal Policy

Sizewell Belts

Lover's Lane

Reckham Pits Wood

Sewage Works

Sizewell Power Station

Leiston Common

Sandy Lane (Track)

Rookyard Wood

Key

Viviparous Lizards - Maximum count

(per day at any point during the survey period)

- Total 1 - 3
- Total 4
- Total 5

0 m 300 m

Scale 1:8500 @ A3

Sizewell Reptile Survey Report 2007

Figure 3.1
Viviparous Lizard distribution map

June 2012
28130-A427.wor tugwc

N

The Round House

The Grove

Walk Barn

Ash Wood

Ash Wood Cottages

Dunwich Forest

Goose Hill

Sandlings Walk

Mean High W

Pit (dis)

Upper Abbey

Pit (dis)

Nursery Covert

Kenton Hills

Old Abbey

Leiston Carr

Grimseys

Fiscal Policy

Sizewell Belts

Lover's Lane

Reckham Pits Wood

Sewage Works

Sizewell Power Station

Leiston Common

Sandy Lane (Track)

Rookyard Wood

Key

Slow Worm - Maximum count

(per day at any point during the survey period)

- Total 1 - 3
- Total 4 - 5
- Total 6 - 8

0 m 300 m

Scale 1:8500 @ A3

Sizewell Reptile Survey Report 2007

Figure 3.2
Slow Worm distribution map

June 2012
28130-A428.wor tugwc

N

The Round House

The Grove

Walk Barn

Ash Wood

Ash Wood Cottages

Dunwich Forest

Pit (dis)

Goose Hill

Upper Abbey

Sandlings Walk

Pit (dis)

Nursery Covert

Old Abbey

Kenton Hills

Grimseys

Leiston Carr

Fiscal Policy

Sizewell Belts

Lover's Lane

Reckham Pits Wood

Sewage Works

Sizewell Power Station

Leiston Common

Sandy Lane (Track)

Rookyard Wood

Mean High W

Key

Adders - Maximum count

(per day at any point during the survey period)

- Total 1 - 3
- Total 6
- Total 9

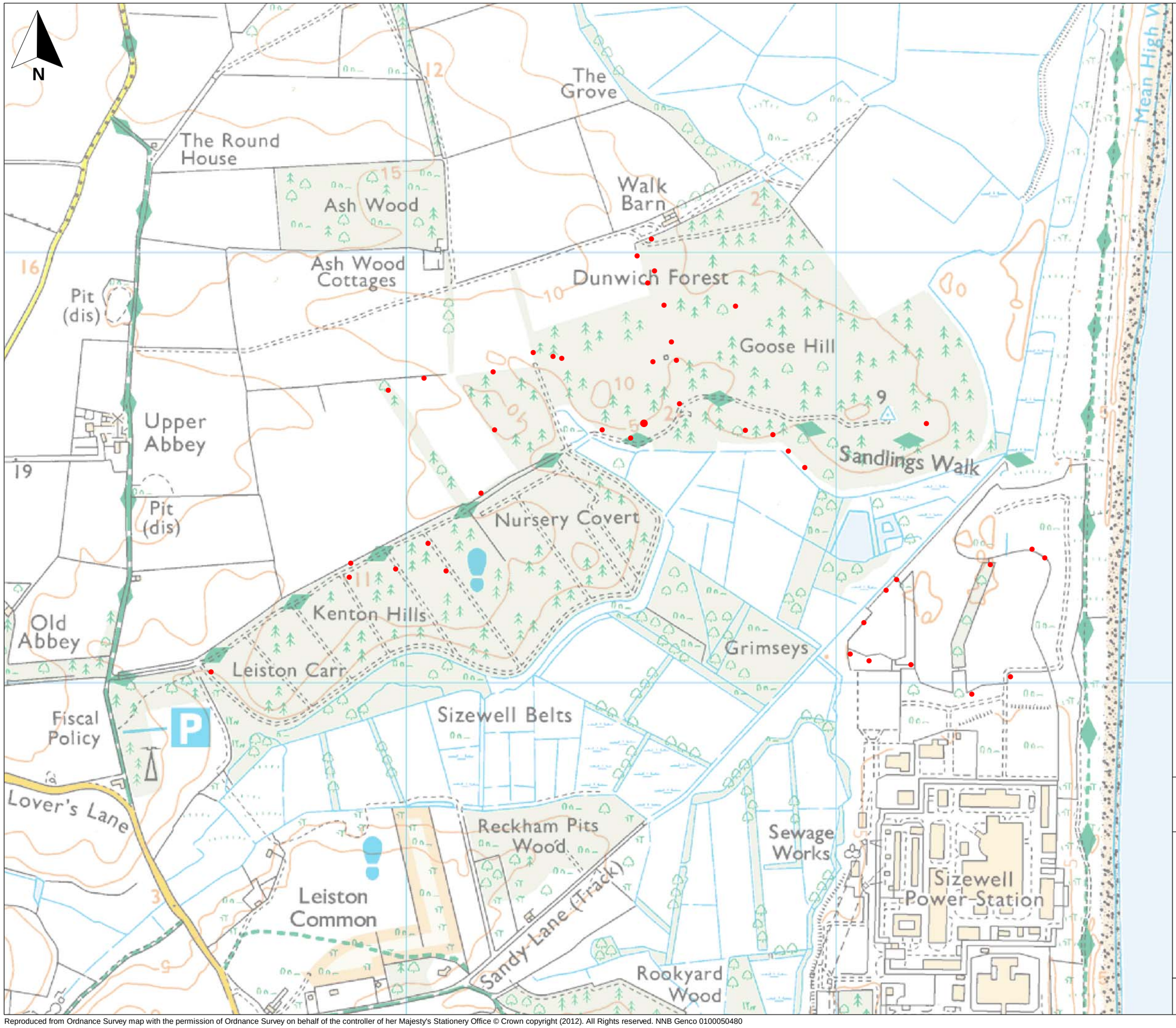
0 m 300 m

Scale 1:8500 @ A3

Sizewell Reptile Survey Report 2007

Figure 3.3
Adder distribution map

June 2012
28130-A429.wor tugwc



Key

Grass Snakes - Maximum count

(per day at any point during the survey period)

- Total 1 - 3
- Total 6

0 m 300 m

Scale 1:8500 @ A3

Sizewell Reptile Survey Report 2007

Figure 3.4
Grass Snake distribution map

June 2012
28130-A430.wor tugwc

Appendix A
Full Reptile Survey Results

31 Pages

REPTILE SURVEY RECORDING FORM (1)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreeve & Tim Sykes **Date: 16/06/07**

Weather

Start Temp: C	**Finish Temp: C**	**Wind Speed: Light**
Cloud cover: 50%	**Rain: None**	**Ground Moisture: None**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
4	Viviparous lizard	1 Adult Male
6	Grass snake	1 Adult
37	Snake Spp.	
58	Viviparous lizard	1 Adult Female
59	Slow worm	1 Adult Female
61	Adder	1 Adult Female

REPTILE SURVEY RECORDING FORM (2)

Site name: Sizewell **Project code: 19801**

Surveyor: Tim Sykes **Date: 18/06/07**

Weather
Start Temp: C Finish Temp: C **Wind Speed: Light**
Cloud cover: 100% **Rain: Rain** **Ground Moisture: Damp**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
6	Viviparous lizard	1 Adult Male
12	Viviparous lizard	1 Adult Male 1 Adult Female
14	Viviparous lizard	1 Adult
17	Viviparous lizard	1 Adult Female
23	Viviparous lizard	1 Adult
26	Viviparous lizard	1 Adult Female
30	Viviparous lizard	1 Adult Female
36	Adder	1 Adult Female
37	Grass snake	-
46	Viviparous lizard	1 Adult Male
47	Viviparous lizard	1 Adult Female
59	Slow worm	1 Female

REPTILE SURVEY RECORDING FORM (3)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreeve & Tim Sykes **Date: 5/07/07**

Weather

Start Temp: 19C	**Finish Temp: 19C**	**Wind Speed: Light**
Cloud cover: 50-95%	**Rain: None**	**Ground Moisture: Dry**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
2	Grass snake	1 Adult
3	Grass snake	1 Adult
4	Grass snake	1 Juv.
15	Grass snake	1 Juv.
17	Viviparous lizard	1 Adult Male
29	Viviparous lizard	1 Adult Female
50	Viviparous lizard	1 Adult
66	Grass snake	1 Juv.
72	Slow worm	1 Adult Female

REPTILE SURVEY RECORDING FORM (4)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreeve **Date: 7/07/07**

Weather

Start Temp: 22C	**Finish Temp: 19C**	**Wind Speed: Moderate**
Cloud cover: 40%	**Rain: Rain**	**Ground Moisture: Wet**

Other weather obs: Two heavy survey showers during survey

Observations

Refugia ID	Species	No. / Age / Sex
5	Viviparous lizard	1 Adult Male
6	Adder	2 Sub-adult Male 1 Adult Female
9	Slow worm	1 Adult Male
	Grass snake	1 Adult
62	Adder	1 Juv.
70	Slow worm	1 Juv.
72	Slow worm	1 Adult Female

REPTILE SURVEY RECORDING FORM (5)

Site name: Sizewell **Project code: 19801**

Surveyor: Tim Sykes **Date: 8/07/07**

Weather

Start Temp: 24C	**Finish Temp: 23C**	**Wind Speed: Light**
Cloud cover: 10-20%	**Rain: None**	**Ground Moisture: None**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
2	Grass snake	1 Adult
6	Adder	1 Adult Female
8	Viviparous lizard	1 Adult
11	Viviparous lizard	1 Adult
48	Adder	1 Sub-adult Male
51	Viviparous lizard	2 Adult Male 1 Adult Female
56	Slow worm	1 Adult Female
58	Slow worm	1 Adult Male
70	Slow worm	1 Adult Female

REPTILE SURVEY RECORDING FORM (6)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreeve **Date: 10/07/07**

Weather

Start Temp: 18C	**Finish Temp: 18C**	**Wind Speed: Light**
Cloud cover: 100%	**Rain: None**	**Ground Moisture: Slightly moist**

Other weather obs: Spots of rain

Observations

Refugia ID	Species	No. / Age / Sex
5	Adder	1 Adult Female
6	Viviparous lizard	1 Adult Male
11	Viviparous lizard	1 Large Female
24	Viviparous lizard	1 Adult Female
27	Viviparous lizard	2 Adult Male
41	Viviparous lizard	1 Adult Male
45	Viviparous lizard	1 Adult Female
55	Viviparous lizard	2 Adult Male
56	Viviparous lizard	1 Adult Male
	Slow worm	1 Adult Male
59	Viviparous lizard	1 Adult Female
70	Slow worm	1 Adult Male
84	Slow worm	2 Adult Male 2 Adult Female

REPTILE SURVEY RECORDING FORM (7)

Site name: Sizewell **Project code: 19801**

Surveyor: Tim JS **Date: 17/07/07**

Weather

Start Temp: 20C	**Finish Temp: 21C**	**Wind Speed: Moderate -strong**
Cloud cover: 20%	**Rain: A few spots**	**Ground Moisture: Dry**

Other weather obs: Blustery windy conditions

Observations

Additional mats distributed on site

Refugia ID	Species	No. / Age / Sex
6	Adder	1 Adult female
9	Viviparous lizard	1 Adult
12	Adder	1 Sub-adult Female
31	Viviparous lizard	1 Adult Male
45	Viviparous lizard	1 Adult Female
46	Grass snake	1 Juv.
59	Viviparous lizard	1 Adult Male
70	Slow worm	2 Adult Female
74	Viviparous lizard	1 Adult
75	Viviparous lizard	1 Adult Female
82	Slow worm	1 Sub-adult Male
84	Slow worm	2 Adult Female
93	Slow worm	1 Adult Female 1 Juv
94	Slow worm	1 Adult Female
103	Slow worm	1 Sub-adult Female
118	Slow worm	1 Adult Female
119	Slow worm	1 Adult Female
123	Slow worm	1 Adult Female 1 Juv.
134	Adder	1 Adult Female
135	Slow worm	1 Adult Female
	Adder	1 Adult Female
138	Slow worm	1 Sub-adult Female 1 Juv.
149	Slow worm	1 Female
150	Slow worm	1 Sub-adult Female
161	Slow worm	2 Adult Male
162	Grass snake	2 Sub-adults
	Adder	7 Mixed Sizes

REPTILE SURVEY RECORDING FORM (8)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreave **Date: 21/07/07**

Weather

Start Temp: 15C	**Finish Temp: 21C**	**Wind Speed: Moderate**
Cloud cover: 25%	**Rain: none**	**Ground Moisture: Dry**

Other weather obs: Increasing cloud cover during the day

Observations

Refugia ID	Species	No. / Age / Sex
2	Viviparous lizard	1 Adult Male
3	Grass snake	2 Adult
	Adder	1 Adult
43	Viviparous lizard	1 Adult
51	Adder	1 Adult Female
70	Slow worm	1 Adult Male
84	Slow worm	3 Adult Female
	Adder	1 Adult
85	Slow worm	2 Adult Female
93	Slow worm	1 Adult Male
109	Slow worm	1 Adult Male 1 Adult Female
121	Slow worm	1 Female
149	Slow worm	1 Adult male
	Grass snake	1
150	Slow worm	1 Adult female

REPTILE SURVEY RECORDING FORM (9)

Site name: Sizewell **Project code:19801**

Surveyor: Tim JS **Date: 22/07/07**

Weather

Start Temp: 17C	**Finish Temp: 20C**	**Wind Speed: Light**
Cloud cover: 25%	**Rain: None**	**Ground Moisture: Slight dampness**

Other weather obs: Occasional grey clouds passing over

Observations

Refugia ID	Species	No. / Age / Sex
1	Grass snake	1 Adult 1 Juv.
3	Grass snake	1 Adult
10	Viviparous lizard	1 Adult
22	Viviparous lizard	1 Adult Female
40	Adder	1 Adult Female
46	Viviparous lizard	1 Adult
55	Viviparous lizard	1 Adult
68	Grass snake	1 Adult
70	Slow worm	1 Adult Female
75	Adder	1 Adult Female
84	Slow worm	4 Adult Female 1 Sub-adult Female
85	Slow worm	1 Juv.
	Grass snake	1 Sub-adult
91	Slow worm	1 Sub-adult male
92	Slow worm	1 Sub-adult female
93	Slow worm	1 Sub-adult male 1 Juv.
94	Slow worm	1 Adult male
104	Slow worm	1 Sub-adult Female
109	Slow worm	1 Sub-adult Male
118	Slow worm	1 Adult Male
119	Slow worm	1 Adult Female
	Adder	1 Sub-adult Female
121	Viviparous lizard	2 Adults
	Slow worm	1 Adult Female
	Adder	3 Adult Female 1 Juv.
123	Slow worm	1 Sub-adult Female
126	Grass snake	1 Juv.
132	Grass snake	1 Juv.
138	Slow worm	1 Adult Female
139	Grass snake	1 Juv.
141	Slow worm	1 Adult Female
142	Snake Spp.	1
147	Slow worm	1 Juv.
148	Slow worm	1 Adult Male 1 Sub-adult male

150	**Slow worm**	**2 Juv.**
156	**Slow worm**	**2 Adult Female**
159	**Adder**	**2 Sub-adult Female**
161	**Slow worm**	**1 Adult Male 1 Juv**
162	**Adder**	**9 Adult 1 Juv.**
	Grass snake	**1 Adult**

REPTILE SURVEY RECORDING FORM (10)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreeve **Date: 23/07/07**

Weather

Start Temp: 11C	**Finish Temp: 13C**	**Wind Speed: Still**
Cloud cover: 100%	**Rain: None**	**Ground Moisture: Moist**

Other weather obs: Spots of rain later / drizzle at times

Observations

Refugia ID	Species	No. / Age / Sex
3	Grass snake	1 Adult
6	Adder	1 Adult Female
9	Grass snake	1 Adult
17	Viviparous lizard	1 Adult Male
26	Viviparous lizard	1 Adult Male
27	Viviparous lizard	1 Adult Male
32	Viviparous lizard	1 Adult Male
51	Viviparous lizard	1 Adult Female
70	Slow worm	1 Adult Male
80	Viviparous lizard	1 Adult Female
84	Slow worm	4 Adult Males
91	Slow worm	1 Adult Male 1 Adult Female
92	Slow worm	1 Adult Male
93	Slow worm	1 Adult Male
94	Slow worm	1 Adult Male
95	Slow worm	1 Adult Female
101	Slow worm	1 Sub-adult Female
107	Slow worm	1 Sub-adult Female
109	Slow worm	1 Adult Male
	Grass Snake	1 Adult
123	Slow worm	1 Adult male 2 Adult Female
124	Slow worm	1 Female
126	Grass snake	2 Adult
130	Grass snake	1 Adult
	Adder	1 Adult
132	Grass snake	1 Juv.
135	Slow worm	1 Sub-adult Female
	Grass snake	2 Adult
	Adder	4 Adult Female
138	Grass snake	1 Adult
141	Slow worm	1 Adult Male
147	Slow worm	1 Sub-adult Female
148	Slow worm	2 Adult Male 1 Adult Female
		1 Sub-adult Female
151	Slow worm	1 Juv.
156	Slow worm	I Adult Male 1 Adult Female

160	**Slow worm**	**1 Adult Male**
162	**Slow worm**	**1 Adult Male**
	Adder	**1 Adult Female**

REPTILE SURVEY RECORDING FORM (11)

Site name: Sizewell **Project code: 19801**

Surveyor: Tim JS **Date: 04/08/07**

Weather

Start Temp: 21C	**Finish Temp: 27C**	**Wind Speed: Light**
Cloud cover: 100-0%	**Rain: None**	**Ground Moisture: None**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
2	Slow worm	1 Adult Male
	Adder	1 Adult Male
13	Viviparous lizard	1 Juv.
31	Viviparous lizard	1 Sub-Adult Male
32	Viviparous lizard	1 Adult Female
34	Adder	1 Adult Female
46	Viviparous lizard	1 Adult Female
69	Slow worm	1 Adult Female
70	Slow worm	1 Sub-adult male
71	Slow worm	1 Adult Male
77	Grass snake	1 Adult
84	Slow worm	5 Adult
85	Slow worm	1 Adult Male
93	Slow worm	1 Adult Male
	Grass snake	1 Adult
104	Slow worm	2 Sub-adult Female
107	Slow worm	1 Juv.
108	Slow worm	1 Juv.
117	Slow worm	1 Juv.
119	Slow worm	1 Adult 1 Juv.
121	Slow worm	1 Adult Female
124	Slow worm	1 Sub-adult Male
133	Slow worm	1 Adult Female
134	Slow worm	1 Juv.
135	Adder	1 Adult Female
	Grass snake	1 Adult
141	Slow worm	1 Juv.
148	Slow worm	1 Adult Male 1 Adult Female
155	Grass snake	1 Juv.
157	Slow worm	1 Adult Male
161	Slow worm	2 Adult Male 1 Sub-adult Female
162	Grass snake	1 Adult

REPTILE SURVEY RECORDING FORM (12)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreeve **Date: 05/08/07**

Weather

Start Temp: 21C	**Finish Temp: 25C**	**Wind Speed: Light**
Cloud cover: 0%	**Rain: None**	**Ground Moisture: Damp in shade**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
50	Viviparous lizard	1 Adult Female
56	Slow worm	1 Adult Female
84	Slow worm	2 Adult Male
85	Slow worm	1 Adult Female
93	Slow worm	1 Adult Male
101	Slow worm	1 Sub-adult Female
104	Slow worm	1 Adult Male
108	Slow worm	2 Adult Male
109	Slow worm	1 Adult Male
117	Slow worm	1 Adult Male
119	Slow worm	1 Sub-adult Male
121	Slow worm	1 Adult Female
122	Slow worm	1 Juv.
124	Slow worm	1 Adult Male
141	Slow worm	1 Adult Male
148	Slow worm	1 Adult Male
157	Slow worm	1 Adult Male
159	Slow worm	1 Adult Male
	Grass snake	1 Adult
162	Adder	1 Adult Male 1 Adult Female
	Grass snake	1 Adult

REPTILE SURVEY RECORDING FORM (13)

Site name: Sizewell **Project code: 19801**

Surveyor: Tim JS **Date: 16/08/07**

Weather
Start Temp: 21C **Finish Temp: 20C** **Wind Speed:**
Cloud cover: 0-100% **Rain: brief shower** **Ground Moisture: Wet after shower**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
1	Adder	1 Adult Male 1 Adult Female
2	Grass Snake	1 Adult
3	Adder	1 Juv.
	Grass snake	2 Adult
10	Viviparous lizard	1 Adult Female
	Slow worm	1 Juv.
18	Viviparous lizard	1 Adult Female 2 Juv.
29	Slow worm	1 Adult Female
39	Viviparous lizard	1 Juv.
44	Viviparous lizard	1 Juv.
50	Viviparous lizard	1 Adult Female
55	Viviparous lizard	1 Adult
59	Slow worm	1 Adult Male 1 Adult Female
60	Viviparous lizard	1 Sub-adult
61	Viviparous lizard	1 Sub Adult
70	Slow worm	1 Sub-adult Male 1 Sub-adult Female
75	Adder	1 Adult
77	Viviparous lizard	2 Juv.
78	Viviparous lizard	1 Adult Female
84	Slow worm	1 Adult Male 4 Adult Female
	Grass snake	1 Juv.
91	Slow worm	1 Adult Female
93	Slow worm	1 Adult Male 1 Sub-Adult Male
107	Slow worm	1 Adult Male
109	Slow worm	1 Juv.
110	Slow worm	1 Adult Female
119	Slow worm	1 Adult Female
123	Viviparous lizard	1 Adult Female
	Slow worm	3 Juv.
124	Slow worm	1 Adult male 1 Juv.
130	Slow worm	1 Adult Female
135	Slow worm	3 Adult Male
	Adder	2 Adult Female
138	Viviparous lizard	1 Juv.

	Slow worm	**1 Adult Female**
141	**Slow worm**	**4 Juv.**
144	**Slow worm**	**1 Adult Female**
148	**Slow worm**	**1 Adult Female**
	Grass snake	**1 Adult**
151	**Slow worm**	**1 Sub-adult Female**
152	**Grass Snake**	**1 Adult**
161	**Slow worm**	**1 Adult Male 3 Juv.**
162	**Slow worm**	**1 Adult Male**
	Adder	**7 Adult 2 Juv.**
	Grass snake	**4 Adult**

REPTILE SURVEY RECORDING FORM (14)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreene **Date: 31/08/07**

Weather

Start Temp: 18C	**Finish Temp: 21.5C**	**Wind Speed: Light**
Cloud cover: 80%	**Rain: None**	**Ground Moisture: Dry**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
1	Viviparous lizard	1 Adult
2	Slow worm	2 Juv.
6	Slow worm	1 Adult Female
9	Grass snake	1 Adult
13	Viviparous lizard	1 Adult 1 Juv.
16	Viviparous lizard	1 Adult
18	Adder	1 Adult
20	Viviparous lizard	1 Juv.
24	Viviparous lizard	1 Adult Male
31	Viviparous lizard	2 Juv.
33	Viviparous lizard	1 Adult
34	Adder	1 Adult Male
42	Viviparous lizard	1 Adult Male
	Grass Snake	1 Adult
55	Viviparous lizard	1 Adult Male
74	Viviparous lizard	1 Adult Male
84	Slow worm	1 Adult Male
85	Slow worm	2 Adult Female
92	Slow worm	1 Adult Female
93	Slow worm	1 Adult Male
94	Slow worm	1 Adult Male
109	Slow worm	1 Adult Female
111	Adder	1 Adult Male
	Grass snake	1 Adult
123	Slow worm	1 Adult Male
	Adder	1 Juv.
126	Slow worm	2 Adult Female
130	Slow worm	1 Adult Male
134	Slow worm	1 Adult Female
135	Slow worm	1 Adult Female
	Adder	1 Adult Male 1 Adult Female 1 Juv.
	Grass Snake	3 Adult
141	Slow worm	1 Adult Male
147	Slow worm	1 Adult Male
148	Slow worm	1 Adult Male 1 Adult Female

149	**Slow worm**	**1 Adult Female 1 Juv.**
150	**Slow worm**	**1 Adult Male 1 Adult Female 1 Juv.**
151	**Slow worm**	**1 Adult Male**
	Grass snake	**1 Adult**
153	**Slow worm**	**1 Adult Female**
156	**Slow worm**	**2 Adult Male 1 Adult Female**
	Grass snake	**1 Adult**
159	**Viviparous lizard**	**1 Adult Male**
	Slow worm	**1 Adult Female**
161	**Slow worm**	**1 Adult Female 1 Juv.**
162	**Slow worm**	**3 Adult Male**
	Adder	**1 Juv.**
	Grass snake	**3 Adult**

REPTILE SURVEY RECORDING FORM (15)

Site name: Sizewell **Project code: 19801**

Surveyor: Tim JS **Date: 5/09/07**

Weather

Start Temp: C	**Finish Temp: C**	**Wind Speed: Light**
Cloud cover: 60%	**Rain: None**	**Ground Moisture: Dew**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
2	Grass Snake	2 Juv.
10	Viviparous lizard	1 Adult Female
19	Viviparous lizard	1 Sub-adult Female
29	Viviparous lizard	4 Juv.
30	Viviparous lizard	1 Juv.
85	Slow worm	1 Adult Male
92	Slow worm	1 Adult Male
93	Slow worm	2 Adult Female
111	Grass snake	2 Adults
126	Adder	1 Juv.
	Grass snake	1 Juv.
129	Slow worm	1 Adult Female
130	Slow worm	1 Adult Female
135	Slow worm	1 Adult Male
141	Grass snake	1 Adult
148	Slow worm	1 Adult Male
153	Slow worm	1 Sub-adult Female
	Grass snake	1 Adult
156	Slow worm	2 Adult Female
	Grass snake	1 Juv.
161	Slow worm	1 Juv.
162	Slow worm	1 Adult Female
	Adder	2 Adult Male 1 Juv
	Grass snake	1 Adult

REPTILE SURVEY RECORDING FORM (16)

Site name: Sizewell **Project code: 19801**

Surveyor: Tim JS **Date: 6/09/07**

Weather

Start Temp: C	**Finish Temp: C**	**Wind Speed: Still**
Cloud cover: 75%	**Rain: None**	**Ground Moisture: Dry**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
2	Grass snake	2 Juv.
10	Viviparous lizard	1 Adult Male 1 Juv.
16	Viviparous lizard	2 Juv.
19	Viviparous lizard	1 Juv.
31	Viviparous lizard	1 Juv.
85	Slow worm	2 Adult Female
92	Slow worm	1 Adult male 1 juv.
93	Slow worm	1 Adult Male 1 Adult Female
109	Slow worm	1 Sub-adult Female
126	Adder	1 Juv.
	Grass snake	4 Adult 1 Juv.
130	Slow worm	1 Adult Female
135	Slow worm	2 Adult
	Grass snake	3 Adult
140	Slow worm	1 Juv.
141	Viviparous lizard	3 Juv.
	Slow worm	1 Adult Male 1 Adult Female
	Grass snake	1 Juv.
144	Grass snake	1 Juv.
148	Slow worm	1 Adult Male
	Grass snake	1 Adult
151	Slow worm	1 Juv.
156	Slow worm	1 Adult Male 2 Adult Female
	Grass snake	1 Juv.
159	Grass snake	1 Adult
161	Slow worm	1 Sub-adult 2 Juv.
162	Slow worm	2 Adult
	Adder	1 Adult Male 1 Juv.
	Grass snake	1 Adult

REPTILE SURVEY RECORDING FORM (17)

Site name: Sizewell **Project code: 19801**

Surveyor: Tim JS **Date: 9/09/07**

Weather
Start Temp: C **Finish Temp: C** **Wind Speed:**
Cloud cover: 100-0% **Rain: None** **Ground Moisture: Damp**

Other weather obs: Overcast to Hot and Sunny

Observations

Refugia ID	Species	No. / Age / Sex
1	Grass snake	1 Adult 1 Juv.
2	Grass snake	1 Juv.
3	Viviparous lizard	1 Sub-adult
5	Viviparous lizard	1 Adult
9	Grass snake	1 Adult
13	Viviparous lizard	1 Juv.
18	Viviparous lizard	2 Sub-adult
19	Viviparous lizard	1 Adult
29	Viviparous lizard	1 Adult Female
39	Viviparous lizard	1 Adult
50	Viviparous lizard	1 Adult Female
53	Viviparous lizard	1 Adult Female
58	Slow worm	1 Juv.
84	Slow worm	1 Adult Female
92	Slow worm	1 Adult Female
93	Slow worm	1 Adult Female 1 Sub-adult Male
94	Slow worm	1 Adult
107	Slow worm	1 Sub-adult Male 1 Juv.
111	Grass snake	1 Adult
124	Viviparous lizard	1 Adult Female
125	Grass snake	1 Juv.
126	Viviparous lizard	1 Adult
	Grass snake	1 Juv.
129	Viviparous lizard	1 Sub-adult Female
130	Slow worm	1 Adult Male
134	Slow worm	1 Juv.
135	Slow worm	2 Adult Males
141	Slow worm	1 Sub-adult Female
148	Slow worm	1 Adult
150	Slow worm	1 Juv.
151	Grass snake	1 Juv.
153	Slow worm	1 Sub-adult Female
156	Slow worm	2 Adult Male
	Grass snake	2 Juv.
159	Slow worm	1 Adult Male

161	**Slow worm**	**1 Juv.**
162	**Slow worm**	**1 Adult Female**
	Adder	**2 Adult Female**
	Grass snake	**1 Adult**

REPTILE SURVEY RECORDING FORM (18)

Site name: Sizewell **Project code: 19801**

Surveyor: Tim JS **Date: 14/09/2007**

Weather

Start Temp: C	**Finish Temp: C**	**Wind Speed: Light**
Cloud cover: 100%	**Rain: Light Rain**	**Ground Moisture: Damp**

Other weather obs: ground wet, rain, started to rain

Observations

Refugia ID	Species	No. / Age / Sex
2	Grass snake	1 Juv.
15	Viviparous lizard	1 Adult
16	Viviparous lizard	1 Adult Female 1 Juv.
18	Grass snake	1 Adult
32	Viviparous lizard	1 Juv.
40	Viviparous lizard	1 Juv.
59	Viviparous lizard	1 Adult
70	Slow worm	1 Adult Female
85	Slow worm	1 Adult Male
92	Slow worm	1 Juv.
93	Slow worm	1 Adult Male 1 Adult Female
102	Grass snake	1 Adult
121	Slow worm	1 Sub-adult Female
125	Grass snake	1 Juv.
130	Slow worm	1 Adult Female
135	Slow worm	2 Adult Females
141	Slow worm	2 Sub-adult Females
148	Slow worm	1 Adult Male
151	Slow worm	1 Juv.
157	Grass snake	1 Adult
161	Slow worm	1 Adult Female
162	Slow worm	1 Sub-adult Female
	Grass snake	1 Adult

REPTILE SURVEY RECORDING FORM (19)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreeve **Date: 15/09/2007**

Weather

Start Temp: 20C	**Finish Temp: 23C**	**Wind Speed: Moderate**
Cloud cover: 35%	**Rain: None**	**Ground Moisture: None**

Other weather obs: ground wet, rain, started to rain

Observations

Refugia ID	Species	No. / Age / Sex
2	Adder	1 Adult Female
5	Viviparous lizard	1 Adult Male
38	Viviparous lizard	1 Adult
70	Slow worm	1 Adult Female
121	Slow worm	1 Adult Male 1 Adult Female
141	Slow worm	1 Adult Male 1 Adult Female
161	Slow worm	1 Adult Female
162	Grass snake	1 Adult

REPTILE SURVEY RECORDING FORM (20)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreeve **Date: 18/09/2007**

Weather

Start Temp: 15C	**Finish Temp: 19C**	**Wind Speed: Moderate**
Cloud cover: 75%	**Rain: None**	**Ground Moisture: Wet**

Other weather obs: Some over night rain

Observations

Refugia ID	Species	No. / Age / Sex
3	Grass snake	1 Juv.
15	Viviparous lizard	1 Adult Male
19	Viviparous lizard	1 Adult
44	Viviparous lizard	1 Adult Male
68	Viviparous lizard	1 Adult Male
70	Slow worm	1 Adult Female
93	Slow worm	1 Adult Male
135	Slow worm	1 Adult Female
141	Slow worm	1 Adult Male 1 Adult Female
159	Grass snake	1 Adult
161	Slow worm	1 Sub-adult Female
162	Slow worm	1 Adult Female

REPTILE SURVEY RECORDING FORM (21)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreeve **Date: 22/09/2007**

Weather

Start Temp: 19C	**Finish Temp: 20C**	**Wind Speed: Still**
Cloud cover: 25%	**Rain: None**	**Ground Moisture: Moist**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
2	Viviparous lizard	1 Juv.
6	Viviparous lizard	1 Juv.
9	Viviparous lizard	1 Juv.
	Adder	1 Adult Female
11	Viviparous lizard	1 Juv.
15	Viviparous lizard	1 Adult
22	Viviparous lizard	1 Adult Male
31	Viviparous lizard	1 Juv.
36	Viviparous lizard	2 Juv.
54	Viviparous lizard	1 Adult Male
55	Viviparous lizard	1 Adult Female
70	Slow worm	1 Adult Female
118	Grass snake	1 Adult
147	Slow worm	1 Juv.
148	Slow worm	1 Adult Female 1 Juv.
150	Slow worm	1 Sub-adult Male
151	Slow worm	1 Juv.
157	Grass snake	1 Adult
162	Adder	1 Adult Female

REPTILE SURVEY RECORDING FORM (22)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreeve **Date: 23/09/2007**

Weather

Start Temp: 20C	**Finish Temp: 22C**	**Wind Speed: Light**
Cloud cover: 15%	**Rain: None**	**Ground Moisture: Moist**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
3	Viviparous lizard	1 Juv.
8	Adder	1 Adult Male
9	Viviparous lizard	1 Juv.
	Adder	1 Adult Female
10	Viviparous lizard	1 Adult Female
11	Viviparous lizard	1 Juv.
19	Viviparous lizard	1 Adult Female
22	Viviparous lizard	1 Adult
30	Viviparous lizard	1 Juv.
53	Viviparous lizard	1 Adult Male
55	Viviparous lizard	1 Adult Female
56	Adder	1 Adult Male
92	Slow worm	1 Juv.
102	Adder	1 Adult Female
	Grass snake	1 Adult
106	Grass snake	1 Adult
135	Adder	1 Adult Female
	Grass snake	1 Adult
141	Slow worm	1 Adult Male
148	Slow worm	1 Juv.
161	Slow worm	1 Adult Female

REPTILE SURVEY RECORDING FORM (23)

Site name: Sizewell **Project code: 19801**

Surveyor: Tim Sykes **Date: 01/10/07**

Weather

Start Temp: 16C	**Finish Temp: 16C**	**Wind Speed: Moderate**
Cloud cover: 100%	**Rain: None**	**Ground Moisture: None**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
2	Viviparous lizard	1 Juv.
5	Viviparous lizard	1 Adult Male
9	Grass snake	1 Juv.
13	Viviparous lizard	3 Juv.
16	Viviparous lizard	2 Adult Female
18	Viviparous lizard	1 Sub-adult female
27	Viviparous lizard	1 Adult Female
28	Viviparous lizard	1 Sub-adult Female
30	Adder	1 Sub-adult Female
34	Adder	1 Sub-adult Female
44	Viviparous lizard	1 Adult Female 1 Juv.
50	Viviparous lizard	1 Adult Male 1 Sub-adult Female
51	Viviparous lizard	2 Sub-adult
54	Viviparous lizard	1 Juv.
55	Viviparous lizard	1 sub-adult
59	Slow worm	1 Adult Male
61	Slow worm	1 Sub-adult Female
74	Viviparous lizard	3 Sub-adult
85	Slow worm	1 Adult Male
135	Slow worm	1 Sub-adult Female
137	Grass snake	1 Juv.
141	Grass snake	1 Juv.
151	Slow worm	1 Sub-adult Female 4 Juv.
162	Slow worm	1 Sub-adult Female

REPTILE SURVEY RECORDING FORM (24)

Site name: Sizewell **Project code: 19801**

Surveyor: Tim Sykes **Date: 02/10/07**

Weather

Start Temp: 14C	**Finish Temp: 14C**	**Wind Speed: Light - Moderate**
Cloud cover: 100%	**Rain: None**	**Ground Moisture: None**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
1	Slow worm	1 Sub-adult Female
2	Viviparous lizard	2 Juv.
9	Grass snake	1 Adult
33	Viviparous lizard	1 Juv.
34	Adder	1 Sub-adult Female
39	Viviparous lizard	1 Juv.
43	Viviparous lizard	1 Juv.
44	Viviparous lizard	1 Adult 1 Sub-adult Female
50	Viviparous lizard	1 Adult Female 1 Sub-adult Female 1 Juv.
51	Viviparous lizard	1 Sub-adult Female
54	Viviparous lizard	1 Juv.
61	Viviparous lizard	1 Juv.
74	Viviparous lizard	2 Sub-adult
76	Viviparous lizard	1 Juv.
79	Viviparous lizard	1 Juv.
85	Slow worm	1 Juv.
95	Slow worm	1 sub-adult Female
111	Grass snake	1 Adult
124	Grass snake	1 Juv.
135	Slow worm	1 Juv.
148	Slow worm	1 Juv.
151	Slow worm	2 Juv.
160	Grass snake	1 Adult
161	Slow worm	1 Juv.
162	Slow worm	1 Sub-adult Female

REPTILE SURVEY RECORDING FORM (25)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreeve **Date: 5/10/07**

Weather

Start Temp: 17C	**Finish Temp: 21C**	**Wind Speed: Still**
Cloud cover: 0%	**Rain: None**	**Ground Moisture: Moist**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
28	Viviparous lizard	1 Adult Female
29	Viviparous lizard	1 Juv.
107	Slow worm	1 Adult Female
129	Snake Spp.	1 Adult
135	Slow worm	1 Adult Female
151	Slow worm	1 Juv.
159	Grass snake	1 Adult

REPTILE SURVEY RECORDING FORM (26)

Site name: Sizewell **Project code: 19801**

Surveyor: Alein Shreeve **Date: 7/10/07**

Weather

Start Temp: 16C	**Finish Temp: 18C**	**Wind Speed:**
Cloud cover: 0%	**Rain: None**	**Ground Moisture: Moist**

Other weather obs:

Observations

Refugia ID	Species	No. / Age / Sex
2	Viviparous lizard	1 Juv.
5	Viviparous lizard	1 Adult Female
6	Viviparous lizard	1 Adult Female
9	Adder	1 Female Sub-adult
10	Viviparous lizard	2 Juv.
11	Viviparous lizard	1 Juv.
28	Viviparous lizard	2 Adult Male 1 Adult Female
31	Viviparous lizard	1 Juv.
32	Viviparous lizard	1 Juv.
48	Viviparous lizard	1 Juv.
50	Viviparous lizard	1 Adult Female 1 Juv.
55	Viviparous lizard	1 Adult Female
93	Slow worm	1 Adult Male
121	Grass snake	1 Juv.
129	Slow worm	1 Adult Female
135	Slow worm	1 Adult Female 1 Juv
138	Grass snake	1 Juv.
150	Viviparous lizard	1 Adult Female
151	Grass snake	1 Adult
155	Grass snake	2 Juv.
157	Grass snake	1 Juv.

EDF Energy

Sizewell C New Nuclear Power Station: Terrestrial and Freshwater Ecology, and Ornithology

DRAFT Coronation Wood Reptile Survey Report 2012

November 2012

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Disclaimer

This report has been prepared in a working draft form and has not been finalised or formally reviewed. As such it should be taken as an indication only of the material and conclusions that will form the final report. Any calculations or findings presented here may be changed or altered and should not be taken to reflect AMEC's opinions or conclusions.

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Document Revisions

No.	Details	Date
1	First Draft to Client	Nov 2012

Contents

1. Introduction

1.1 Purpose of this Report

An area of land directly north of Sizewell B Nuclear Power Station, which is located near Leiston in Suffolk, has been identified as having the potential to accommodate the proposed development of one or more new nuclear reactors. This proposed development is known as Sizewell C. The site of the proposed development has an approximate central National Grid Reference (NGR) of TM473640.

AMEC Environment & Infrastructure UK Ltd (formerly Entec UK Ltd) was commissioned by EDF Energy in 2012 to undertake a reptile survey of Coronation Wood (a block of woodland located adjacent to the west of Sizewell A Power Station) and suitable habitats bordering the existing car parks to the west and north of Sizewell B. The area surveyed is hereafter called 'the site'.

The purpose of this report, which details the findings of survey work undertaken for reptiles in 2012, is to provide baseline information on the value of the site for reptiles, to inform the design of Sizewell C and the Environmental Statement for the scheme. The report documents the methods used to determine reptile presence on the site, and the results of the survey undertaken; brief recommendations are also made for mitigation and enhancement works appropriate to the proposed redevelopment of the site.

1.2 Site context

The site forms part of the Sizewell estate and is located adjacent to the west and north of the Sizewell power station. The area surveyed for reptiles consists predominantly of woodland edge habitat which comprises small areas of scattered scrub, tall ruderal vegetation, patches of rough grassland, and small woodland glades within an area of conifer plantation comprising of rough grassland and small patches of scrub.

1.3 Legislation

The four widespread[1] species of reptile that are native to Britain, namely viviparous lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*), adder (*Vipera berus*) and grass snake (*Natrix natrix*), are listed on Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and are afforded limited protection under Section 9 of this Act. This makes it an offence, inter alia, to intentionally kill or injure any of these species.

[1] The two other native species of British reptile (sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca*) receive a higher level of protection under the *Wildlife and Countryside Act* 1981 (as amended). However, the distribution of these species is restricted to a limited number of sites in particular geographic locations.

In addition to the legislation relating to reptiles, the National Planning Policy Framework ((NPPF) 2012 states that the planning system should contribute to and enhance the natural and local environment by "*minimising impacts on biodiversity and providing net gains in biodiversity where possible*"; that planning permission for developments should be refused if significant biodiversity harm cannot be "*avoided (through locating on an alternative site with less harmful impacts), adequately mitigated or, as a last resort, compensated for*"; and that "*opportunities to incorporate biodiversity in and around developments should be encouraged*".

2. Desktop Study

2.1 Methods

Existing information regarding reptiles within the Sizewell estate and the surrounding land was obtained from the following sources (further detail is provided in the Sizewell Desk Study report):

- Suffolk Biodiversity Records Centre (SBRC) 2012; and
- Entec UK (2007). British Energy Group PLC Sizewell Reptile Survey Report 2007.

2.2 Results

The 2007 reptile surveys conducted across the Sizewell estate confirmed the widespread presence of all four common reptile species. The population classification indicated that an exceptional population of both adder and slow worm are present within the Sizewell estate, with good populations of grass snake and common lizard. Additionally the desktop studies also confirmed the presence of all four species within the wider area. Extensive records of common lizard, adder and grass snake exist for the land surrounding the estate, with the majority of the observations being made by Robin Harvey at the Minsmere Birds reserve located to the north. The study of aerial photography indicates that there is connective habitat suitable for reptiles between Minsmere and the study area.

In addition to these formal records, a large number of incidental observations of reptiles have been made by AMEC surveyors across the Sizewell estate between 2007 and 2012 whilst undertaking survey work for other species.

3. Field Survey

3.1 Methods

A presence/absence survey for reptiles was carried out on the site within habitat highlighted by the initial ecological survey[2] to have the potential to support reptiles. The survey involved seven visits to the site between August and early October 2012. Survey visits comprised the following methods, based on those recommended by Griffiths and Inns[2], and Froglife[3]:

- Direct observation - during each survey visit to the site the locations of any reptiles observed basking in the open were recorded;
- Refugia searches - any existing potential refugia on the site were carefully searched for reptiles, especially log-piles, rubble and discarded wood or old carpet; and
- Artificial refugia - artificial refugia were placed across the site, as shown in Figure 3.1 (Appendix A). The survey was set up on 4 July, with 54 refugia positioned across the site. Refugia were placed along margins of scrub, rough grassland, bramble and ruderal vegetation, which are optimal reptile habitat, and also within open glades within the coniferous woodland plantation. The artificial refugia comprised 48 0.5m x 1.0m sheets of roofing felt and 6 0.5m x 0.5m sheets of corrugated metal. All reptiles observed on, alongside or under the refugia were recorded during each survey visit.

Reptile activity is very dependent on the weather and time of year, as reptiles are ectotherms and therefore must bask in order to warm themselves and become active. April, May and September are key months for basking reptiles, as more continuous mid-summer heat means reptiles require less basking time to become active[1]. Successful surveys may still be carried out from June to August and October, however, if weather conditions are suitable. Optimum conditions are intermittent sunshine with little or no wind, particularly after a spell of cooler or wetter weather. Individual species have some specific preferences but generally it is preferable to survey when the temperature is between 10°C and 17°C[2].

The weather conditions encountered during the survey period are considered to be suitable for surveying and assessing reptile populations. Weather conditions were recorded in detail on each visit, as were the species, age class and sex of reptiles observed.

3.2 Results

The results of the field survey are summarised in Table 3.1. Reptile distribution across the site is illustrated in Figure 3.2 (Appendix A) and full results are presented in Appendix B.

[2] Griffiths, R. and Inns, H. (1998). Surveying. *In*: Gent, A. H. and Gibson, S. D. eds. *Herpetofauna workers' manual*. Joint Nature Conservation Committee, Peterborough, pp1-13.

[3] Froglife (1999). *Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife Advice Sheet 10. Froglife, Halesworth.

Table 3.1 Summary of Reptile Survey Results

Survey visit no.	Date	Weather conditions	Reptiles recorded			
			Viviparous lizard	Slow worm	Adder	Grass snake
1	17/08/12	Cloud cover: 20%. Wind speed: light. Ground moisture: dry. Rain: none. Temperature: 17-19°C.	4M, 3F	1M	-	-
2	19/9/12	Cloud cover: 15%. Wind speed: light. Ground moisture: dry. Rain: none. Temperature: 14-15°C.	3M, 3F, 1A	1F	1 F	-
3	21/09/12	Cloud cover: 90%. Wind speed: light. Ground moisture: Dry. Rain: none. Temperature: 15-15°C.	4M, 2F, 2A	1F	-	-
4	28/09/12	Cloud cover: 10%. Wind speed: light. Ground moisture: moist. Rain: intermittent. Temperature: 14-15°C.	1M, 1F, 1A	1M	-	-
5	02/10/12	Cloud cover: 20%. Wind speed: Moderate. Ground moisture: damp. Rain: none. Temperature: 17-18°C.	9M, 6Juv	1M, 2F	-	1A
6	03/10/12	Cloud cover: 80%. Wind speed: light. Ground moisture: wet. Rain: none. Temperature: 18 -18°C.	2M, 2F, 5Juv	-	-	-
7	04/10/12	Cloud cover: 0%. Wind speed: Still. Ground moisture: dry. Rain: none. Temperature: 17-19°C.	-	-	-	-
Maximum survey count per species		Adult	9	3	1	1
		Juvenile	6	0	0	0

Key: M = Male, F = Female, Juv = Juvenile, A = Adult but sex unknown[4], Temperature=(start temp.)°C-(Finish temp.)°C, NR=Not recorded.

[4] In instances where it was not possible to determine either sex (brief/unclear sighting), total number of individuals with a size class was noted.

4. Evaluation

4.1 Methods

Evaluation of the reptile populations at Coronation wood is based on the availability of suitable habitats, and the findings of both the desk and field studies. This information has been interpreted using professional judgement in order to define whether or not the species' populations can be considered a 'valued ecological receptor', i.e. of sufficiently high value in terms of biodiversity conservation that an effect upon it could be significant in terms of favourable conservation status. That said, regardless of whether or not reptile populations are considered to be valued ecological receptors, there is a need to recognise that they are legally protected and measures must be taken to ensure that contravention of the relevant legislation is avoided.

4.2 Results

All four common native reptile species have been confirmed to be present on this part of the Sizewell estate, with maximum adult counts of 3 slow worms, 9 viviparous lizards, 1 grass snake and 1 adder recorded during the survey. The desk study revealed multiple records of viviparous lizard, slow worm, adder and grass snake within the study area. A full population estimate has not been undertaken; however, the results indicate the presence of a good viviparous lizard population and low populations of slow worm, grass snake and adder according with the Froglife[4] survey assessment criteria.

Reptiles within the survey area are distributed along the western boundary of the site/woodland edge and within the woodland glades that have minimal shading from trees. The habitats in these areas consist of rank improved grassland, scrub and patches of tall herbs which offer suitable habitat for sheltering, basking and foraging. The remaining areas of habitat comprise conifer plantation and offer little in the way of suitable habitat for reptiles. There is little to no ground vegetation beneath the canopy of the pine trees and these areas are heavily shaded.

All four species were recorded during the survey; however, only viviparous lizards were recorded within the pine plantation on the north of the survey area. All of the reptiles observed within this area were within the open glades, which comprise rough tussocky grassland. This part of the survey area is considered to be suboptimal for slow worms as they are a burrowing species and the hard dry ground conditions provide little burrowing potential. The conditions within this part of the site are also considered suboptimal for grass snake, due to the absence of suitable water bodies, which are a favoured hunting ground for this species. A number of Adders have been observed on the bund to the east of the pine plantation and within the areas of semi-improved grassland to the north during site walkovers. No observation of adder were made within the glades of the pine plantation, although it is considered likely that lower numbers of adder may use this part of the site due to the presence of suitable prey species and basking sites.

Both slow worm and viviparous lizard were also recorded along the entrance road/car park to the west of the site where patches of bramble scrub and a strip of unmanaged grassland offer

suitable habitat. These species are less susceptible to human disturbance than the other two common reptile species, and can often be found in similar edge habitats.

Grass snake and adder were only recorded in the southwestern part of the survey area. This part of the survey area is screened off from the power station by a large block of woodland. These species do not tolerate high levels of disturbance and as a result of the presence of suitable terrestrial habitat and in the case of grass snake suitable aquatic habitat also, this part of the site is optimal for these species.

In accordance with Froglife guidelines[5], as the site supports all four common native reptile species, it meets their criteria for a Key Reptile Site. However, the survey findings indicate that only a good population of viviparous lizards is likely to be present, with low populations of the other three reptile species present. The reason for this is likely that the majority of the site is suboptimal for reptiles due to both the high levels of disturbance from human activity at the power station and the limited availability of optimal reptile habitat with reptile populations restricted mainly to small areas including the woodland glades and areas of scrub and unmanaged habitat around the periphery of the site.

Given the low densities of reptiles present, the limited area of suitable habitat, and the fact that large areas of habitat optimal for reptiles is present with the Sizewell estate and wider area, the area of habitat at Coronation wood is not regarded as a 'valued ecological receptor' for reptiles. Notwithstanding this, there is still a requirement to ensure that any development works on-site comply with the legislation that relates to these species (see section 1.4).

5. Conclusion and Recommendations

5.1 Conclusions

The results of the presence/absence survey of Coronation Wood for reptiles indicate the presence of a good population of viviparous lizard and low populations of grass snake, adder and slow worm. The majority of the site, however, is currently suboptimal for reptiles due to a combination of poor habitat suitability across most of the site and the high level of disturbance from activities at the power station including site maintenance work, with reptile populations restricted to the woodland edge and the open glades within the woodland. The site is therefore not regarded a 'valued ecological receptor' for reptiles.

Best practice guidelines recommend that 20 survey visits should be undertaken in order to make a population estimate. However, provided development proposals are limited principally to areas of suboptimal reptile habitat, AMEC does not consider that any additional useful information would be gained from increasing the survey effort to this level.

The results of this survey work should be used to inform the design and implementation of any proposed development with the ultimate aim being to 'design out' any adverse effects on the reptile populations. If this is not possible there will be a need to produce and execute a comprehensive mitigation strategy prior to any development works. This should ensure the avoidance of harm to reptiles, thus avoiding contravention of the legislation regarding these species, as well as fulfilling local and regional policy requirements in respect of biodiversity conservation and enhancement.

5.2 Recommendations

It is recommended that an ecologist is involved in the development planning process from an early stage. This will allow the ecologist to work closely with other members of the design team to best address the issues related to reptiles.

Planning must aim to protect reptiles from any harm that might arise during the development work and show consideration of NPPF which stipulates a need to '*minimising impacts on biodiversity and providing net gains in biodiversity where possible'*.

In order to adequately address these requirements, the new development will likely need to implement a comprehensive reptile mitigation strategy, taking into account available guidance[5,6,7] prior to any works commencing on-site as well as incorporating features within the

[5] English Nature (2004). *Reptiles: guidelines for developers*. English Nature, Peterborough.

[6] Herpetofauna Groups of Britain and Ireland (1998). *Evaluating local mitigation/translocation programmes: maintaining best practice and lawful standards. HGBI advisory notes for Amphibian and Reptile Groups (ARGs).* HGBI, c/o Froglife, Halesworth.

[7] Clemons, J. and Langton, T. (1998). Species translocations. *In*: Gent, A. H. and Gibson, S. D. eds. *Herpetofauna workers' manual*. Joint Nature Conservation Committee, Peterborough, pp107-112.

development design to enhance the habitats not only for herpetofauna, but also for biodiversity in general.

Mitigation

Principally the design should look to avoid the removal of optimal reptile habitat, identified as being the woodland edge habitat and the open glades within the woodland. Ideally the mitigation strategy would involve retaining and managing these on-site habitats as a nature area for reptiles. By designing out adverse effects on optimal reptile habitat the mitigation strategy can avoid the necessity for extensive mitigation measures described below which include the location and creation of compensatory habitat and translocation of whole reptile populations.

Where impacts on optimal habitat can not be avoided the design must provide compensatory habitat of sufficient quality, quantity and connectivity to accommodate the reptile population with no net loss of local reptile conservation status. Compensatory habitat should ideally be provided either on or directly adjacent to the site.

Enhancement and preparation works on compensatory habitat would need to be implemented prior to any development work affecting reptile habitats. A translocation exercise may then be required to trap and relocate reptiles from the areas being affected by the development into the newly created habitats. The translocation exercise can take between 2 and 6 months with works seasonally constrained, being limited to the April-early October period.

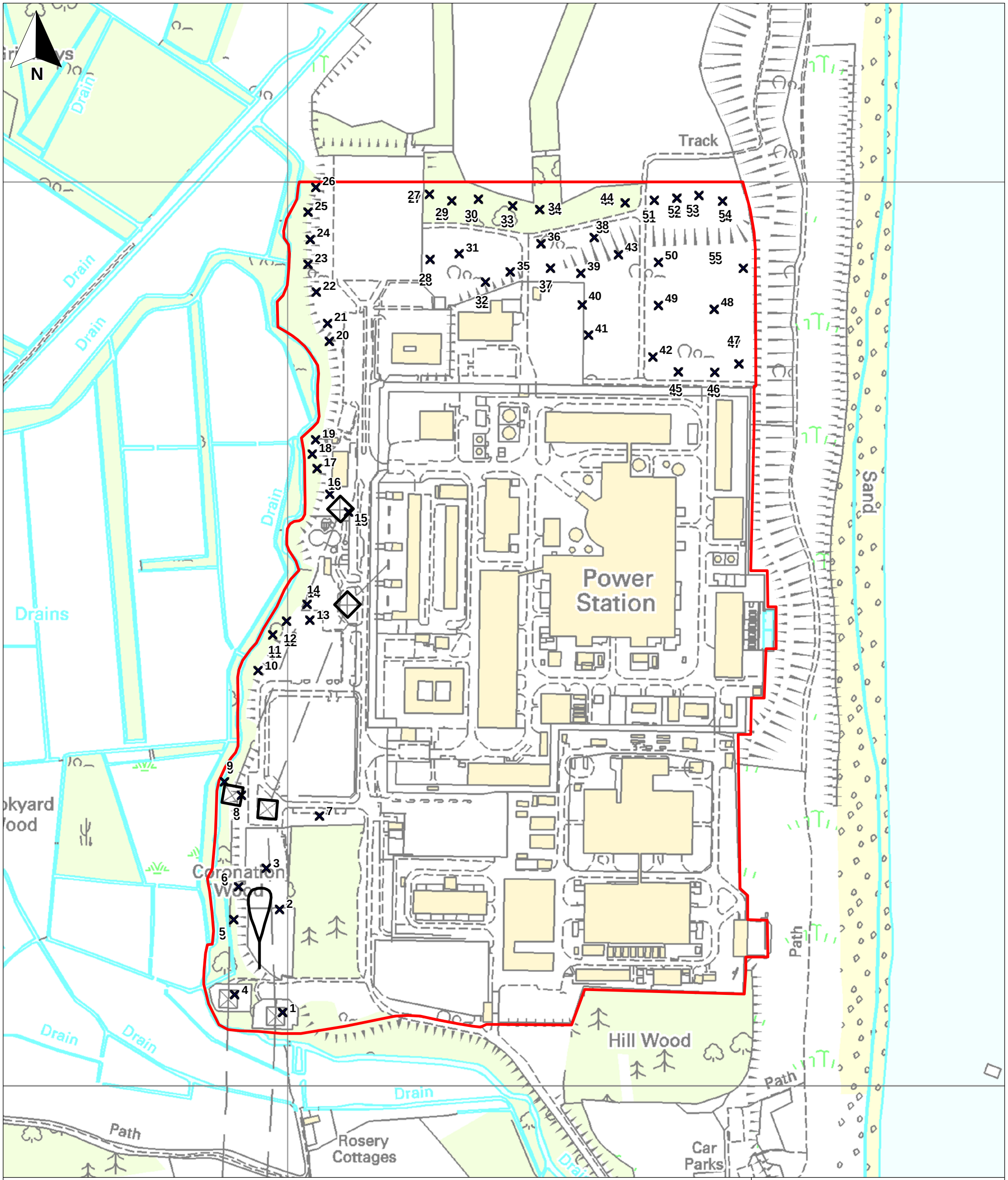
If impacts on optimal habitat can be avoided then mitigation will still be required for all vegetation removal required as part of the development including the removal of less optimal habitat for reptiles, such as the pine woodland plantation. Mitigation works will likely involve manually strimming vegetation in two stages to ground level followed by a destructive search. This would involve searching through vegetation and debris and removing topsoil using a suitable excavator. A suitably qualified ecologist would supervise such works and catch any reptiles that may be disturbed.

Enhancement

In order to meet the criteria of NPPF policies the habitats on the site can be easily managed to enhance their value to reptiles and biodiversity in general. Such features may involve:

- Periodic thinning of heavy scrub cover in areas of optimal habitat such as the south western corner of the site, to increase basking opportunities and prevent a reduction in habitat quality over time;
- Installing hibernacula in areas of optimal habitat to increase opportunities for hibernation and shelter.

Appendix A
Figures



Key:

- Survey area
- ✕ 1 — Reptile refugia locations
- Pylon

0 m — 250 m

Scale 1:4,000 @ A3

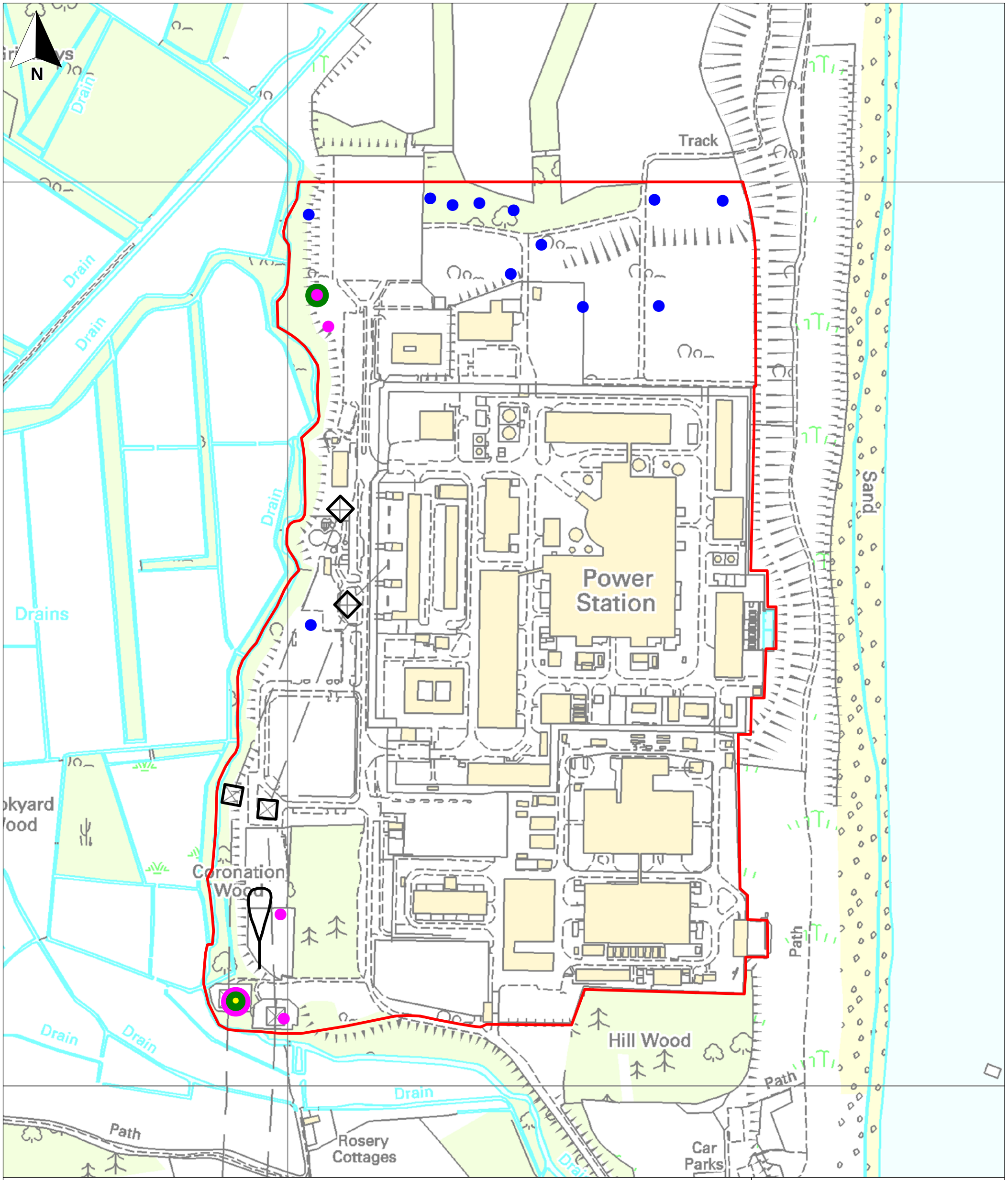
EDF

Sizewell Coronation Wood
Reptile Survey Report 2012

Figure 3.1
Survey Area and Refugia Locations

November 2012
28130-A459.wor tugwc

amec



Key:

- Survey area
- Slow worm
- Common lizard
- Grass snake
- Adder
- Pylon

0 m — 250 m

Scale 1:4,000 @ A3

Sizewell Coronation Wood
Reptile Survey Report 2012

Figure 3.2
Reptile Distribution Map

November 2012
28130-A473.wor tugwc

Appendix B
Full Reptile Survey Results

Date of survey visit	Weather	Refugium no.	Reptiles observed
17/08/12	Cloud cover: 20%. Wind speed: light. Ground moisture: dry. Rain: none. Temperature: 17-19°C.	2	1 adult male slow worm
		4	1 adult ale common lizard
		27	1 adult male common lizard
		29	1 adult male + 1 female common lizard
		30	1 adult male + 1 female common lizard
		54	1 female common lizard
19/9/12	Cloud cover: 15%. Wind speed: light. Ground moisture: dry. Rain: none. Temperature: 14-15°C.	4	1 adult female slow worm
			1 adult female Adder
		13	1 adult female common lizard
		25	1 adult male + 1 female common lizard
		35	1 adult male common lizard
		36	1 adult male common lizard
		49	1 adult common lizard
		51	1 adult female common lizard
21/09/12	Cloud cover: 90%. Wind speed: light. Ground moisture: Dry. Rain: none. Temperature: 15-15°C.	13	1 adult male + 1 female common lizard
		21	1 adult female slow worm
		27	2 adult male + 1 female + 2 adult common lizard
		36	1 adult male common lizard
		51	1 adult common lizard
28/09/12	Cloud cover: 10%. Wind speed: light. Ground moisture: moist. Rain: intermittent. Temperature: 14-15°C.	22	1 adult male slow worm
			1 adult common lizard
		27	1 adult male common lizard
		35	1 adult female common lizard

Date of survey visit	Weather	Refugium no.	Reptiles observed
02/10/12	Cloud cover: 20%. Wind speed: Moderate. Ground moisture: damp. Rain: none. Temperature: 17-18°C.	1	2 adult female slow worm
		2	1 adult male common lizard
		4	1 adult male slow worm
			1 adult grass snake
		13	1 adult male common lizard
		29	1 adult male common lizard
		30	6 juvenile common lizard
		33	2 adult male common lizard
		40	1 adult male common lizard
		51	1 adult male common lizard
		54	2 adult male common lizard
03/10/12	Cloud cover: 80%. Wind speed: light. Ground moisture: wet. Rain: none. Temperature: 18 -18°C.	2	1 adult female common lizard
		4	1 adult female common lizard
		27	2 juvenile common lizard
		30	3 juvenile common lizard
		29	1 adult male common lizard
		40	1 adult male common lizard
04/10/12	Cloud cover: 0%. Wind speed: Still. Ground moisture: dry. Rain: none. Temperature: 17-19°C.	-	none

Royal Haskoning
Sizewell Power Station ISFSI and Car Park Extension Reptile Survey Report 2008

1. Introduction

1.1 Background

Entec UK Ltd have been commissioned by Royal Haskoning (working on behalf of British Energy) to provide ecological support for an Environmental Impact Assessment for a new proposed development that will be located within and immediately adjacent to the existing Sizewell B nuclear plant. The proposed development comprises two components;

- The creation of a new independent spent fuel storage installation (ISFSI) to the south of the existing Sizewell 'B' Power Station (located on an existing car park); and
- A car park extension to the north of the existing western car park servicing Sizewell 'B' (to replace the car park lost as a result of the ISFSI).

The location of the proposed development site is shown in **Figure 1.1**.

The first phase of ecological works comprised an Extended Phase 1 Habitat Survey, carried out in August 2008. The results of this survey are illustrated in **Figure 1.2** and a summary is included within the Ecological Scoping Report already issued (Entec Doc. Reg. 23693cw005r, 2008). During the survey, the presence of common lizards (*Zootoca vivipara*) was recorded within the proposed footprint of the car park extension and habitats with the potential to support reptiles were noted within this area. A reptile survey to determine which species were present and the relative size of any populations was therefore recommended.

1.2 Site Description and Context

The site of the new ISFSI is primarily an existing car park and therefore predominantly comprises hard-standing. The current site boundary overlaps with a small electricity substation building which is surrounded by gravel and hard-standing. Adjacent to this part of the proposed development area are further areas of hard-standing, amenity grassland and a small strip of introduced shrub (located to the west). This area was considered to have negligible potential to support reptiles, and was therefore excluded from the survey.

The site of the proposed car park (central OS Grid Reference TM 470 634) comprises an open area of poor, semi-improved grassland of about 0.4ha, that has either regenerated or been re-seeded following the construction of the Power Station and which supports species indicative of calcareous substrates. The majority of the grassland and herb sward is short and disturbed by fairly extensive grazing by rabbits and trampling, especially in the central and eastern section. Although some scattered tall ruderal plants also occur, this area of the survey area is considered unlikely to support reptiles due to the lack of cover provided by the vegetation present.

The western section of the grassland is less grazed, rougher and damper, with a more complex sward structure. Beyond the western site boundary the land drops away to a wooded valley. The upper part of this bank is un-shaded and there are several small log piles and areas of scattered scrub. Given the habitat structure, this area is by far the most suitable to support reptiles within the survey area.

The grassland is bordered to the south by dense and scattered scrub, introduced shrub and scattered trees. These are generally characterized by sparse ground flora, offering little shelter for reptiles. To the east a sparse, narrow 'hedge' with very little ground flora borders the grassland. This hedge is planted on a 30-50cm high bank, located on the grassland and is supported by logs and stones, several of which are loose providing small gaps into the bank. Some potential for reptiles was noted here, though little vegetation cover is present.

Immediately to the west of the wooded valley, approximately 30m from the development area, lies the Sizewell Marshes SSSI, which covers an area of 104ha. This site was designated on the basis of the large area of lowland unimproved wet meadow it contains. Associated with the wet meadows are outstanding assemblages of invertebrates, breeding birds and several nationally scarce plant species. The SSSI is on an area of deep fen peat with a permanently high water table. There is an extensive ditch system and the area is prone to flooding.

The main Sizewell 'B' Power Station (and associated hard-standing) lies to the east of the survey area. Areas of hard standing are also present to the north and south of the site. Linear, semi-natural habitats occur to the north of the survey area in the form of grass borders and scrub, which link the survey area to suitable reptile habitats to the north of the power station.

1.3 Legislation

All the common, native species of reptiles (common or viviparous lizard, adder *Vipera berus*, grass snake *Natrix natrix* and slow worm *Anguis fragilis*) are listed under Schedule 5 of The Wildlife and Countryside Act (1981). Part of Section 9(1) and all of Section 9(5) apply. As such it is an offence to:

- Intentionally kill or injure an individual of these species; and
- Transport for sale or exchange, or offer for sale or exchange a live or dead an individual or any part of an individual of these species.

All native reptile species are listed on the new UK BAP Priority Species list published in 2007, as well as on the List of Species of Principal Importance under Section 41 of the NERC Act 2006[1]. The Suffolk BAP lists adder as a character species.

Entec has interpreted 'intentionally' as meaning 'not taking steps to avoid' in line with current interpretation of legal terminology (Simpson, 2007). It is therefore necessary for proposed developments to take account of potential effects on reptiles.

[1] The Secretary of State for Environment, Food and Rural Affairs was required under Section 41(1) of the NERC Act 2006 to prepare a list of the species and habitats considered to be of principal importance for the purpose of conserving biodiversity in England. It replaces the list published by Defra in 2002 under Section 74 of the Countryside and Rights of Way (CRoW) Act 2000.

1.4 Purpose of Survey Work

The implication of the legislation is that proposed developments need to take account of potential effects on reptiles. In areas where suitable habitat exists, and in the absence of contemporary baseline data existing for the species (that is directly relevant to a proposed development site), survey work is necessary to establish whether reptiles are present, and if present to determine an indicative population size. This enables appropriate mitigation, translocation, habitat enhancement and creation initiatives to be planned and incorporated into the design of the development concerned, and ensures that there is no significant negative effect on the conservation status of the species at local level. The presence of reptiles within the area is well documented (refer to section 3.1). The aim of the survey work in this case was to determine which species currently use the area of the proposed car park extension and in what relative numbers.

2. Methods

2.1 Desk Study

Existing information regarding reptiles within the Sizewell Estate and surrounding land was obtained from the following sources:

- Multi-Agency Geographical Information System website (www.magic.gov.uk);
- Suffolk Wildlife Trust (SWT);
- ADAS and SWT: Sizewell Land Management Report – Annual Review 2007-2008 and 2006-2007;
- British Energy (including the Integrated Land Management Plan [ILMP] and studies undertaken by ecological consultants, SWT, the Environment Agency, universities and colleges, special interest groups and individuals; and
- Suffolk Amphibian and Reptile Group. Suffolk Amphibian and Reptile Atlas Provisional (2007) by Martin Sanford (Suffolk Biological Records Centre) and John Baker (Suffolk Amphibian and Reptile Group).

2.2 Field Surveys

The survey methodology followed guidance provided in Froglife's Advice Sheet 10 – Reptile Survey, an introduction to planning, conducting and interpreting surveys for snake and lizard conservation (Froglife, 1999) and took into account additional guidance provided by Gent & Gibson (2003).

2.2.1 Survey Area

The proposed car park extension site consists of roughly 0.5ha. The areas within this targeted by the reptile survey include the areas of rough grassland on the western section of the site, the more open areas of grassland on the upper part of the slope and the areas of scrub bordering the site as a whole. Photographs of representative areas of habitat are included in **Appendix A**.

2.2.2 Artificial Refugia

Artificial refugia, comprising of 0.5m x 1m roofing felt and corrugated tin sheets, were laid out within the preliminary works area in locations considered to have the highest potential to support reptiles on the 8th September 2008.

When conducting survey work aimed at deriving indicative population sizes for reptiles, Froglife (1999) recommend placing 5-10 refugia per hectare (ha) of suitable habitat. A total of 40 reptile refugia were used for this survey of 0.5ha, significantly exceeding the recommended density. All the refugia were numbered and mapped for ease of data recording. **Figure 2.1** illustrates the locations and numbers of these refugia on the site.

The surveys were not limited to refugia checks. While moving between tiles, surveyors recorded any reptile flushed, basking or otherwise seen. For ease of data interpretation, these were recorded as being located at the nearest tile.

For each individual reptile sighted, the following data was recorded: refugia number, species, age class and sex.

2.2.3 Timing of Survey and Weather Conditions

Thirteen survey visits were made between 12th September and 3rd October 2008. Although a variety of weather conditions occurred on the survey days, these were suitable for surveying the reptile populations. Weather conditions were recorded in detail on each visit and these are included in the survey data in **Appendix B**.

2.2.4 Survey Limitations

The surveys were carried out within the time of year and weather conditions recommended by Froglife guidelines (1999) and are considered sufficient to characterise the reptile population present. The guidance recommends that surveys are carried out between March and October, with March, April and September being the most productive months, given suitable weather conditions. A suitable air temperature for surveys should be between 9° and 18° C (HGBI, 1999). These conditions were met throughout this survey, though low night time temperatures (5°-7° C) during the latter days at the beginning of October may have resulted in lower numbers of individual reptiles being observed, though the species present are all likely to have been recorded accurately.

It is not always possible to identify the species or sex of an animal in the time afforded by brief glimpses during a survey when reptiles are disturbed. On one occasion a brief sighting of a snake was made which could not be confirmed to species level with certainty. It was likely to have been a juvenile grass snake, based on the size and colour of the tip of the tail that was observed, and has therefore been recorded as such.

2.3 Biodiversity Evaluation

2.3.1 Population Classification

The Froglife (1999) guidelines set out a method for obtaining a population class for reptile species, based on the maximum number of adults recorded on a single survey visit. This is also the basis for the selection of Key Reptile Sites. Certain sites may qualify for Key Reptile Site status and this may in turn lead to their designation as a County Wildlife Site (CWS). **Table 2.1** below summarises the method used for calculating class size.

Table 2.1. Classification of the Reptile Populations

Species	Low Population (Score 1 point)	Good Population (Score 2 points)	Exceptional Population (Score 3 points)
Common lizard	< 5	5 – 20	> 20
Slow worm	< 5	5 – 20	> 20
Adder	< 5	5 – 10	> 10
Grass snake	< 5	5 – 10	> 10

N.B. Figures in the table refer to maximum number of adults seen by observation and/or under tins (placed at a density of 10 per hectare), by one person in one day.

To qualify for the Key Reptile Site Register a site must meet at least one of the following criteria:

- It supports three or more reptile species;
- It supports two snake species;
- It supports an exceptional population of one species;
- It supports an assemblage of species scoring a total of at least 4 points; or
- The site does not satisfy the above criteria but is of particular regional importance due to local rarity.

This population class assessment is also used to quantify any subsequent mitigation required, such as the recommended duration of any translocation exercises that may be necessary, as detailed by the Herpetofauna Groups of Britain and Ireland (HGBI, 1998). A population class assessment as outlined above was carried out for each reptile species found to be present within the survey area.

2.3.2 Habitat Evaluation

The value of the habitats present for reptiles within the survey area at Sizewell will be assessed based on the findings of the survey results as well as on contextual information, such as previous records, connectivity to suitable habitat outside the survey area and the status of each species within the local area, the county and across the country.

In terms of biodiversity conservation value, species' populations, habitats and sites have been valued using the geographical frame of reference described below, which have been adapted from those set out by IEEM (2007):

- International;
- UK;
- National (i.e. England);
- Regional (i.e. East of England);
- County (i.e. Suffolk);

- District;
- Parish; and
- Less than parish.

The above frame of reference is intended to standardise the evaluation process and ensure that the scale of any impacts can be clearly understood.

With reference to these IEEM categories, when attempting to value the importance of a site to reptiles the consultant must ultimately make an informed decision based on professional judgement. To inform the process of evaluation, a wide ranging desk study is required to complement the results of survey work and subsequent estimations of relative population size, as this will inform as to whether the site is:

- Typical of the county, region or area;
- To what extent the indicative size of the populations of the reptile species supported are notable; and
- Where the site is located in relation to other areas of nearby suitable reptile habitat (i.e. it could comprise sub-optimal habitat on the edge of more suitable habitat or it could provide an important link for a reptile population that could otherwise become fragmented).

Habitat quality, including structural and floristic diversity, the extent of the habitat available, its fragility and rarity, can also be factored into the evaluation process. Other tools that can be used for guidance include criteria for the selection of County Wildlife Sites and the Reptile Key Sites Criteria published by Froglife and summarised above.

3. Results

3.1 Desk Study

Historical Information relating to the Sizewell Estate

The Sizewell Land Management Report Annual Review 2007-2008 and 2006-2007 by ADAS and SWT indicate that slow worm, common lizard, adder and grass snake are all present within an area surveyed at Goose and Kenton Hills, 900 m to the north-west of the proposed development site.

SBRC indicates that all four common reptile species are widespread throughout the Sizewell Estate and beyond. All four species have been recorded within the estate within the last 9 years with many recent records for common lizard, adder and grass snake. However, only seven records exist for slow worms dating back to 1980.

Previous Entec Surveys of parts of the Sizewell Estate (2007)

A reptile survey undertaken by Entec in 2007 (in relation to the new nuclear build proposals) found that all four common reptile species were present within the area surveyed (which is located to the north of the existing Power Station and proposed development site) with exceptional (as defined by Froglife, 1999) populations of adders and slow worms, a good

population of common lizard and a low population of grass snake present. This indicates the quality and continuity of reptile habitat within the Sizewell Estate.

Common lizards where observed throughout the survey period. The results show a clear concentration of this species in the habitats closer to the coastline, most notably the un-grazed, improved grassland swards and within the coastal grassland habitats. Common lizards were observed in low numbers at isolated locations within the plantation woodland of Dunwich Forest and Goose Hill, but records were absent further west.

In contrast to the common lizard distribution, high numbers of slow worms were recorded in greater densities and more frequently within the woodland habitats along ride edges. This distribution was fairly even across the plantation woodland habitats. An absence of records is apparent in more open habitats towards the coastline with only a few observations made within the un-grazed grassland within the potential new build area. These observations were made primarily in areas close to dense scrub and/or woodland habitats that provided denser cover.

Adders were observed in both the open grassland habitats to the east of the area surveyed and within the plantation woodland habitats, with no clear distinction between the two. There appear to be hubs of greater densities of this species within Dunwich Forest, with lower numbers elsewhere. Grass snakes, although slightly more frequently recorded, exhibit a similar distribution to the adder population recorded within the survey.

During this survey, all four species were recorded ~500m north from the proposed car park extension site, in an area connected to the site by further suitable habitat.

Information Relating to the Wider Area

Extensive records of common lizard, adder and grass snake exist for the land surrounding the estate, with the majority of the observations being made by Robin Harvey at the Minsmere RSPB Reserve located to the north. A study of aerial photography and knowledge of the habitats present gained through other survey work carried out for BE (in relation to the potential new nuclear build) indicate that there is connecting habitat suitable for reptiles between Minsmere and the Sizewell Estate.

Allan Miller and Carl Powell of the SWT[2] were contacted formally by Entec in January 2008 in relation to the potential new nuclear build. They supplied the results of the ongoing reptile surveys at Leiston Common, which lies about 900m to the west of the site. All four species were found to be present here.

At a county level, common lizard, grass snake and slow worm are general fairly widespread and all show a wide distribution within the area around the Sizewell Estate along the coastal habitats (Suffolk ARG, 2007). However, adder populations in Suffolk are nearly entirely restricted to sandy heathland areas (SWT, adder information fact sheet and Suffolk ARG, 2007). The adder population present within the Sandlings is of at least regional level biodiversity importance for the species, given the geographical continuity and size of the population. This area now covers about 2000ha in total, consisting of areas of remnant heath, which stretch along the Suffolk coast from Ipswich to Southwold.

[2] Allan Miller and Carl Powell are conservation managers of the Sizewell Estate and have considerable knowledge of the area.

3.2 Field Survey

A summary of the survey data is presented in **Appendix B**.

The surveys confirmed the presence of common lizard within the study area, with a maximum of 1 adult per visit (totalling 5 sightings, all females). However, higher numbers were recorded during the Extended Phase 1 Survey of the site and surrounding area, when six common lizards, of which at least 4 were adults, were seen. A possible sighting of a juvenile grass snake was also noted during the reptile surveys. The distribution of the reptile sightings was not uniform and most were made in the rough grassland at the top of the western slope.

Furthermore a dead adult adder, probably a road casualty, was found ~30m to the south-east of the survey area, within an area of gravel, adjacent to the main access roads. This individual is likely to have originated from the site, as this the nearest suitable habitat to where the carcass was found.

3.3 Biodiversity Evaluation

3.3.1 Population Classification

From the results of the survey it has been confirmed that, given the numbers of adult reptiles observed, a low population of common lizard is present. It is possible that very small numbers of adder and grass snake (i.e. 1 or 2 individuals) may also occur, based on the likely sighting of a juvenile grass snake and the dead adder found nearby. However, usage of the site by grass snake and adder is only likely to be occasional, given the size of the habitat available and because both snake species can range widely between hibernation and mating/summer foraging areas (Beebee and Griffiths, 2000).

Therefore, based on the survey results, the site does not currently qualify as a Key Reptile Site, as the adults of only one species were recorded here. Whilst it is acknowledged that both grass snake and adder are likely to occasionally use the site, and this would therefore meet the criteria of a Key Reptile Site, it is considered more appropriate to consider the potential development site as a small, peripheral area of the wider Sizewell Estate (which from the desk study data would clearly qualify as a Key Reptile Site) and not as a Key Reptile Site in its own right.

Given the site's size (0.5ha) and the low quality of habitat available, it does not qualify as a County Wildlife Site.

3.3.2 Habitat Evaluation

About 75% of the site (the central, eastern, northern and southern sections) comprises habitat which is considered unlikely to support reptiles, given the extent of rabbit grazing and lack of cover available for foraging or hibernating.

Therefore, a total of approximately 0.1ha of suitable reptile habitat exists on site. Optimum habitat is present on the slope on the western section of the site, in the form of the rough grassland, scrub and wood piles. This area has greatest potential for use during hibernation as it is free draining and supports mammal burrows and log piles. However, low numbers of reptiles were recorded in this area during the survey, suggesting it is unlikely to support large numbers of hibernating reptiles.

The rough grassland on the flatter areas is also suitable for reptiles, particularly during the times of year of peak activity, as is the southern margin of the site, which due to the vegetation cover it provides is likely to be used for foraging by small numbers of reptiles.

The low bund on the eastern boundary of the site may be suitable for hibernating reptiles, however little vegetation cover for reptiles is present immediately around this, resulting in a low probability of this area being found and subsequently used by reptiles.

Overall, based on the amount and quality of the habitat available for reptiles, the site is considered to be of no more that parish value for this species group.

4. Conclusions

Low numbers of common lizard were recorded during the surveys, concentrated around the slope on the western boundary of the site. Adder and grass snake are also likely to be present in very low numbers.

Because of the connective habitat to areas offsite, the survey area can not be considered to support a reptile population in its own right, rather a number of individuals which are part of the populations in the wider area. These individuals are linked through suitable connective habitat with the population to the north recorded during the previous survey conducted by Entec (Entec Doc. Reg. 19801cr166).

5. Recommendations

The loss of the central area of the site would not result in a detrimental effect to the reptile populations of the area, and may not even affect individual animals, due to the poor quality habitat present. Therefore, neither mitigation nor compensation would be required for development that avoids the best areas of reptile habitat.

Should areas of suitable reptile habit be affected (particularly the western area) by works to reinforce the bank for example, it would represent at least a short-term loss of a small area of suitable habitat. If it were to be lost entirely, a long-term loss of habitat would occur and compensatory measures are recommended.

Loss of suitable reptile habitat could be compensated for by modifying the management of the grass banks west of the existing car park to the south of the survey area. These are currently maintained as amenity grassland, offering little potential as reptile habitat. Even if the management were limited to stopping scrub encroachment and reducing mowing with the aim of obtaining a more diverse and longer grass sward, the local reptile population would benefit greatly. This new area of habitat would also still be linked to the SSSI to the east. The area to the west of the car park extension could also be managed in this way to maintain connectivity to reptile habitats to the north. This would minimise the habitat loss and potentially result in a conservation gain for the proposed car park development.

In order to avoid injury to individual reptiles, a phased clearance of the development area supervised by an ecologist from Entec UK is recommended ahead of the construction works. This should occur during the summer months when reptiles not in hibernation and could be achieved through strimming of grassland, manual cutting of scrub and a turf strip (destructive searching) and will encourage any reptiles present to move away from construction site. This is particularly important if it is necessary to clear the western area of the site and areas of scattered or dense scrub.

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Author:

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Reviewer:

Owain Gabb

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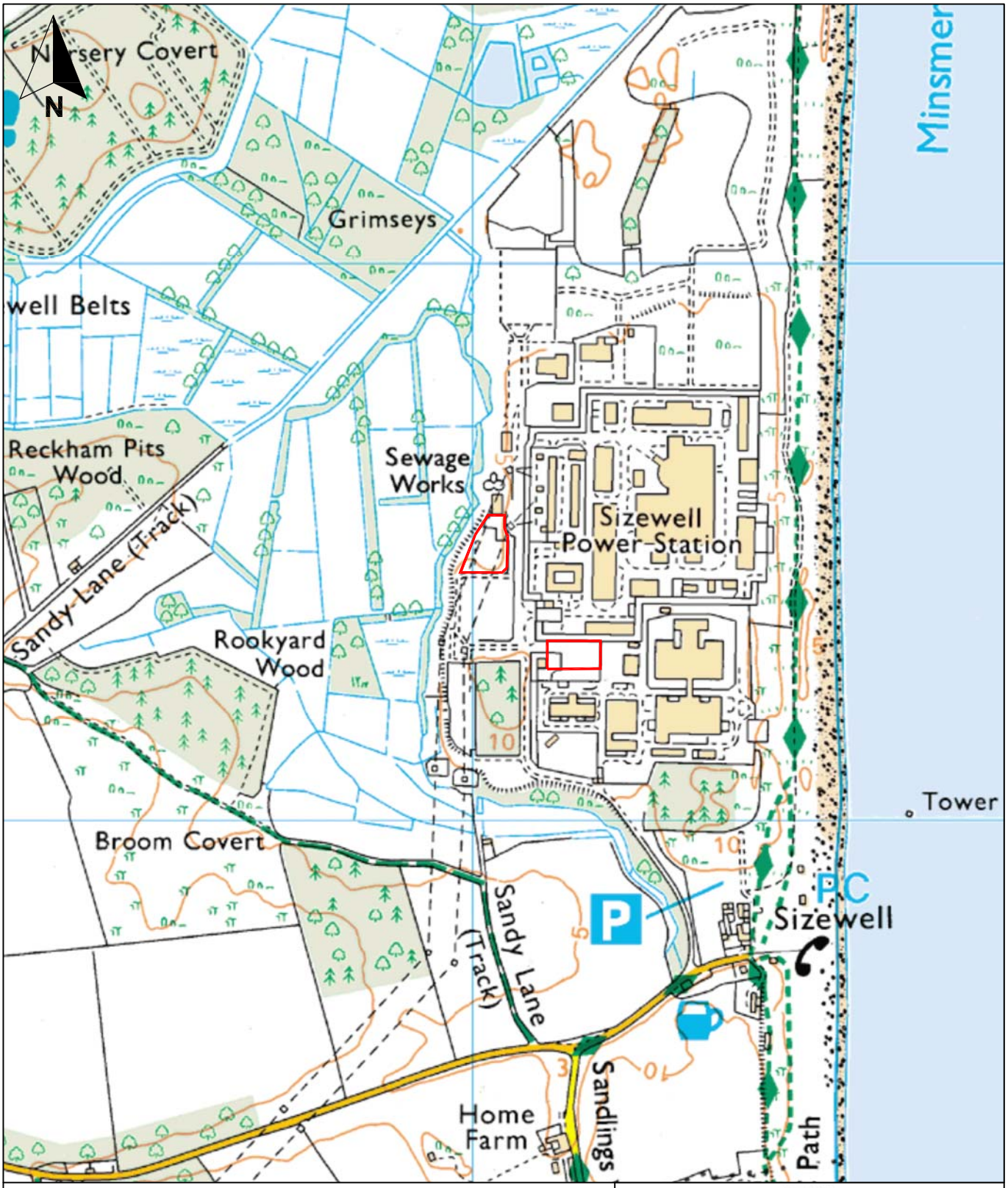


Key

Proposed Development Site Boundary

0 m 500 m

Scale 1:10,000 @ A4

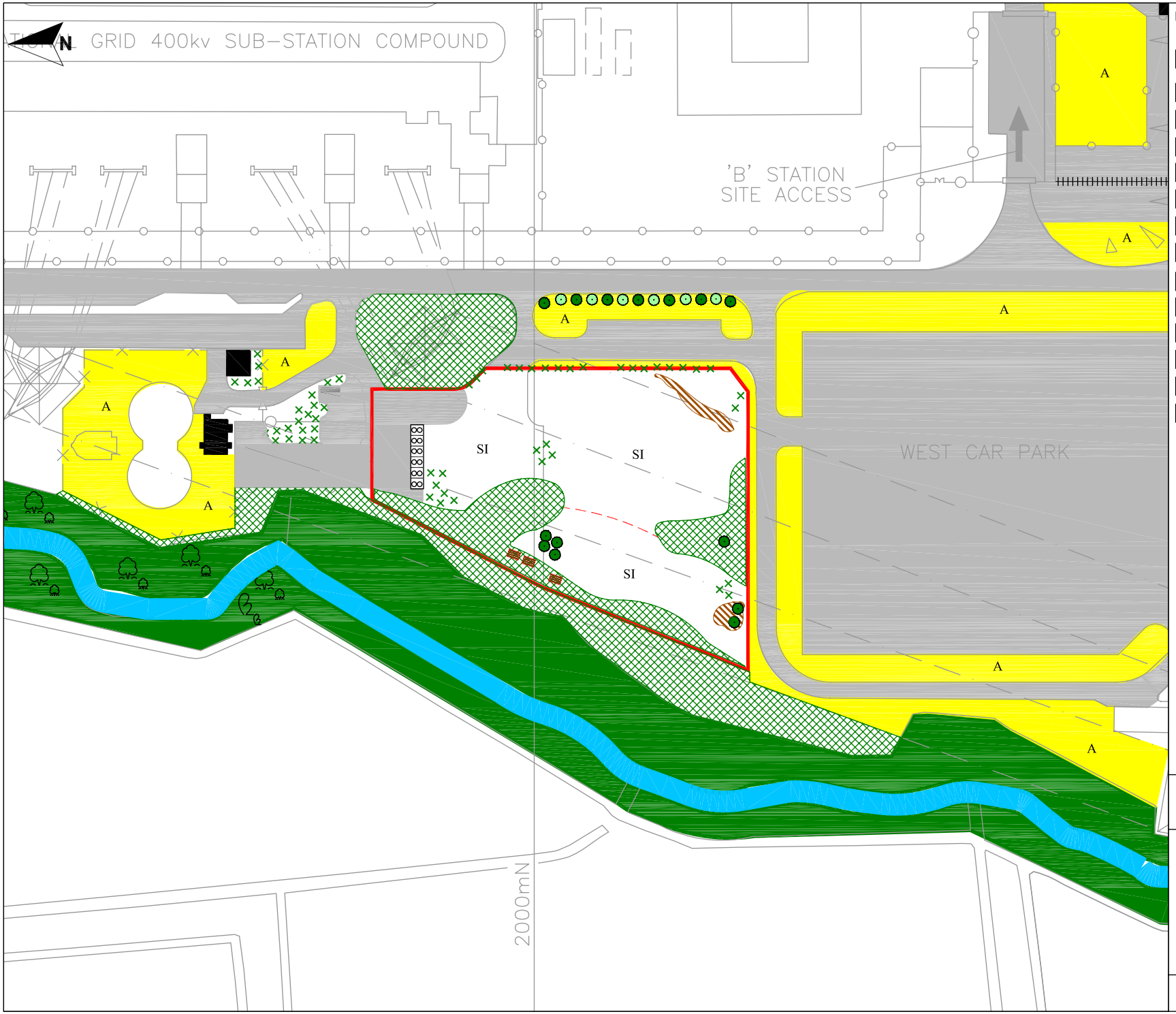
ROYAL HASKONING

Royal Haskoning
Sizewell Power Station ISFSI
and Car Park Extension
Reptile Survey Report 2008

Figure 1.1
Proposed Development Site Boundary

October 2008
23693-B06.dwg marsa01

Entec



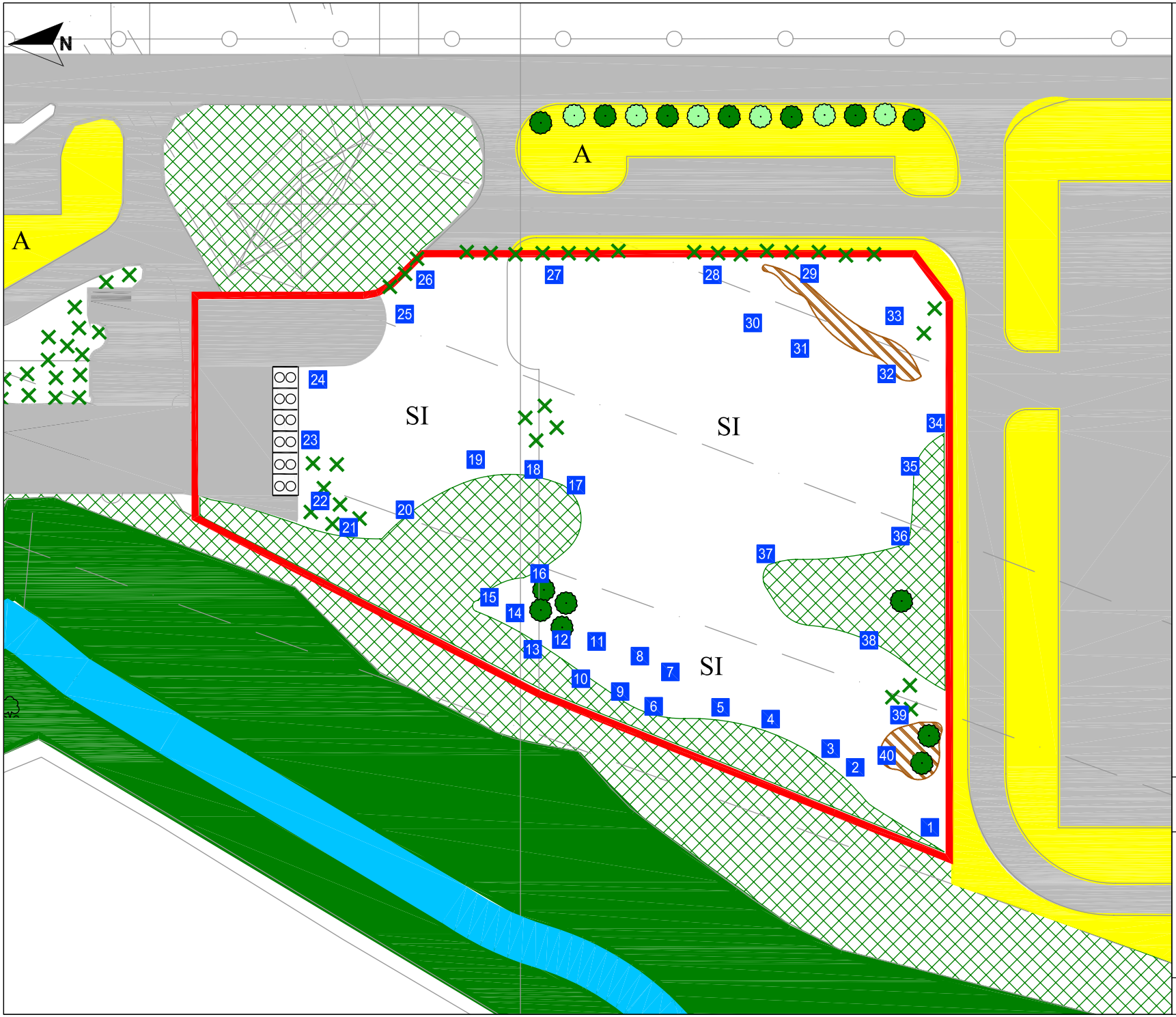
ROYAL HASKONING

Royal Haskoning
Sizewell Power Station ISFSI
and Car Park Extension
Reptile Survey Report 2008

Figure 1.2
Phase 1 Habitat Map of Car Park Extension

October 2008
23693-B07.dwg marsa01

Entec



Key

- Proposed development site boundary
- Structure / building
- Hardstanding
- A — Amenity grassland
- SI — Poor semi-improved grassland
- Dense scrub
- Scattered scrub
- Broadleaved woodland
- Mixed connifer and broadleaf trees
- Fence
- Wooden log piles
- Oil drums on wooden pallets
- 33 — Artificial refugia
- Tall ruderal

0 m — 30 m

Scale 1:500 @ A3

ROYAL HASKONING

Royal Haskoning
Sizewell Power Station ISFSI
and Car Park Extension
Reptile Survey Report 2008

Figure 2.1
Location of Artificial Refugia

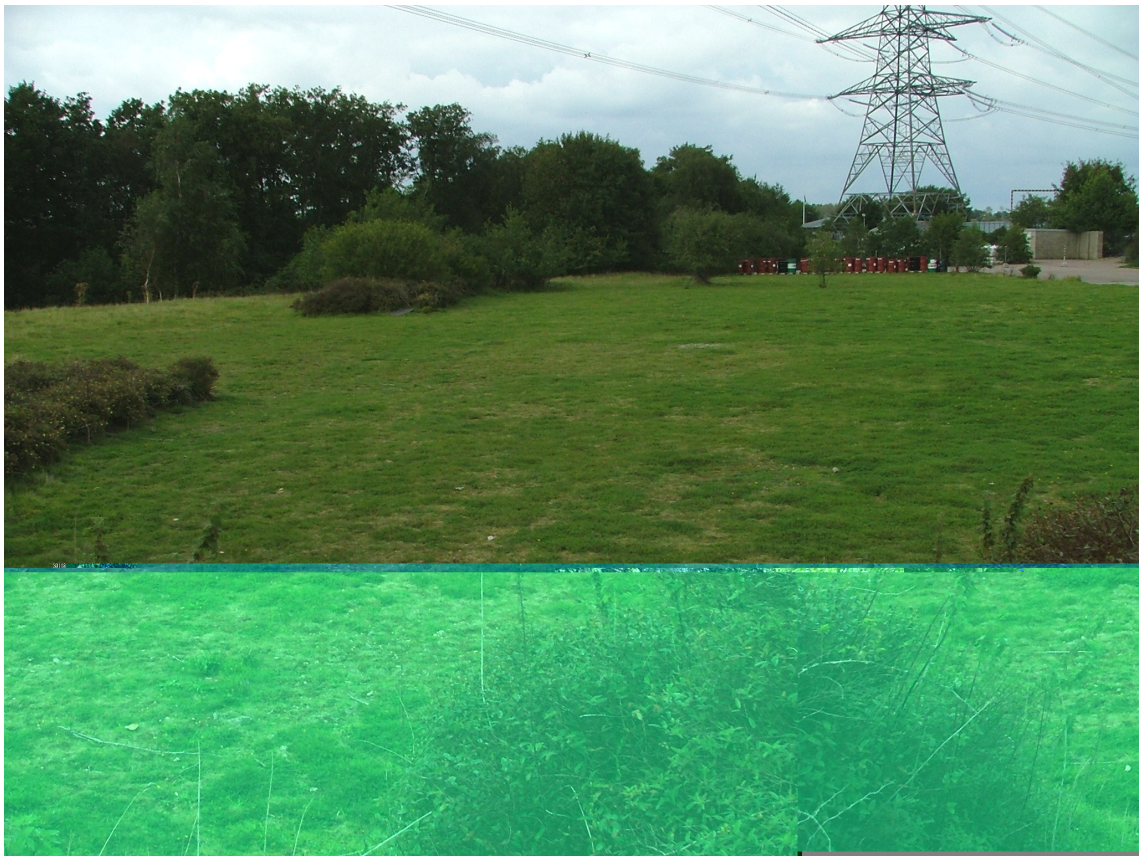
October 2008
23693-B08.dwg marsa01

Entec

Appendix A
Photographs Illustrating Habitats Surveyed

Photograph 1. View of slope to the west of the grassland area.

Photograph 2. View of central area of semi-improved grassland.



Appendix B
Summary of Reptile Survey Results

Survey Day	Date	Start time	Weather conditions					Surveyor	Common lizard (adults) total	Slow worm (adults) total	Grass snake (adults) total	Adder (adults) total	All species' adult total	All species' total (with juvs)
			Temp.	Wind	Cloud (%)	Ground	Rain							
1	12/09/2008	15:00:00	15 - 16 C	None	95	Wet	Earlier in day	JB						
2	13/09/2008	9:00:00	16	None	25	Damp	None	RC						
3	14/09/2008	09:45:00	17	2-3E	40	Damp	None	RC						
4	16/09/2008	12:30:00	16	None	95	Dry	None	JB	1				1	1
5	20/09/2008	11:00:00	19 - 20 C	0-1 SE	25	Damp	Overnight, none during survey	RC	1				1	1
6	21/09/2008	11:30:00	18- 19 c	0-1 SE	25	Damp	None	RC	1				1	2
7	24/09/2008	13:00:00	15	1-2 NE	90	Wet	Earlier in day, light	JB						
8	26/09/2008	12:00:00	17	0 -1	0.5	Dry	None	JB						
9	27/09/2008	11:30:00	18-19	0-1 SE	15	Damp from dew	None	RC	1				1	1
10	28/09/2008	12:30:00	14	2 to 3	70	Dry	None	JB						
11	29/09/2008	10:30:00	14	None	25	Dew	None	ET						
12	01/10/2008	12:30:00	14	2 to 3	70	Dry	None	JB	1				1	1
13	03/10/2008	12:00:00	10	1-2 N	90	Wet	Some as survey finished	JB						

EDF Energy
Sizewell Aldhurst Farm Reptile Survey Report 2010

1. Introduction

1.1 Background to Development

An area of land directly north of the Sizewell 'B' Power Station has been identified as having the potential to accommodate new nuclear plant 'Sizewell C'. This area, which covers 0.49km^2/49ha, is referred to in this document as the 'Strategic Site Area (SSA).' In addition to these permanent development proposals there will also be a number of temporary construction activities and other associated developments.

To facilitate the development of Sizewell C, based on current proposals, it is likely that around 6ha of Sizewell Marshes SSSI will be lost. This area comprises predominantly reed bed and open water with fringing wet woodland. As a result of the potential loss within the SSSI there is a proposal to create compensatory habitat on farmland at 'Aldhurst Farm' located immediately to the west of the SSSI and on the north-eastern edge of Leiston.

In February 2010 an extended Phase 1 habitat survey of Aldhurst Farm identified that this compensation area contained habitats that had the potential to support reptiles. Field studies undertaken by Entec UK Ltd also identified that all four commonly occurring species of reptile are widespread throughout the Sizewell estate and adjoining habitats[1].

The proposed conversion of land at Aldhurst Farm would likely result in the loss of habitats which have potential to support reptiles. Reptile survey work was therefore required to establish the presence of reptiles on site and undertake an assessment of any reptile populations in order to avoid contravention of the legislation that protects these animals in the UK (See section 1.2).

This report documents the methods used to undertake the reptile population assessment at Aldhurst Farm, and the results of the survey undertaken; recommendations are also made for appropriate mitigation required for the proposed conversion of the site to reed bed and open water.

1.2 Legislation

All six of the native reptile species of Britain are listed on Schedule 5 (Animals which are Protected) of the Wildlife and Countryside Act (1981), as amended. Under section 9 (parts 1 & 5) all species on Schedule 5 are protected from being intentionally killed, injured or taken or from being traded.

[1] Entec (2008) British Energy Group PLC. Sizewell Reptile Survey Report 2008.

Entec has interpreted 'intentionally' as meaning 'not taking steps to avoid' in line with current interpretation of legal terminology (Simpson, 2007). It is therefore necessary for proposed developments to take account of potential effects on reptiles.

2. Methods

2.1 Desk Study

Existing information regarding reptiles within the Sizewell estate and surrounding land was obtained (further detail is provided in the Sizewell Desk Study report) from Existing information regarding reptiles within the survey area and surrounding land was obtained from readily available sources including the NBN Gateway[2] and from the following sources.

- The Suffolk Wildlife Trust (SWT)[3]
- Suffolk Biodiversity Records Centre (SBRC)
- Cresswell Associates (2005). Sizewell A Power Station Decommissioning ES. Section 12: Ecology. Magnox Electric.
- Entec (2008) British Energy Group PLC. Sizewell Reptile Survey Report 2008.

2.2 Field Survey

2.2.1 Method

A preliminary presence/absence survey (seven visits) established the presence of reptiles and therefore the survey was extended to a full population assessment (twenty visits). A population class size assessment of Aldhurst Farm was undertaken in order to understand the extent of any existing reptile population present and its distribution. When conducting survey work aimed at deriving indicative population sizes for reptiles, Froglife (1999)[4] recommend placing 5-10 refugia per hectare (ha) of suitable habitat. Please note that this does not refer to the entire area but the area of habitat considered to be suitable to support reptiles.

A maximum of approximately 5ha of habitat within Aldhurst Farm was identified as being suitable to support reptiles and as such would require between 25 and 50 refugia being placed within the survey area. Taking into account the nature of the habitats on the ground a total of 44 refugia tiles were laid in order to undertake the survey, thereby meeting the requirements of the Froglife guidance.

Artificial refugia, comprising of 0.5m x 1m roofing felt and corrugated tin sheets, were laid out within the survey area in locations considered to have the highest potential to support reptiles. These were placed in three main regions, a field margin of rank grassland along the eastern site boundary, an area of rank grassland adjacent to a wet ditch to the east of the site and a section of

[2] http://data.nbn.org.uk/

[3] Information included a report [Gooch, M (2002). Reptile survey of Leiston Common, Sizewell, Suffolk. Report to Suffolk Wildlife Trust].

[4] Froglife (1999) Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

semi improved grassland in the centre of the site; **Figure 2.1** illustrates the locations of these tiles in the field.

While suitable habitat could be found around the majority of the site boundaries, these areas were often too narrow and in close proximity to areas of high agricultural activity, with a risk of interference to refugia mats and disturbance to reptiles.

2.2.2 Timing of Survey and Weather Conditions

Twenty survey visits were made between August and October. Survey effort was concentrated towards August and September when the weather for surveying reptiles is identified to be optimal by Froglife (Froglife 1999) when temperatures are cooler compared with June and July, thereby making reptile sightings more frequent. Reptile activity is very dependent on the weather and time of year, therefore surveys were conducted as far as was practically possible in optimum conditions. As ectotherms, reptiles must bask in order to warm themselves and become active. April, May and September are key months for basking reptiles, as more continuous mid-summer heat means reptiles require less basking time to become active. Successful surveys may still be carried into October however, if weather conditions are suitable. Optimum conditions occur under intermittent sunshine with little or no wind; particularly after a spell of cooler or wetter weather. Individual species have some specific preferences although generally it is preferable to survey when the temperature is between 10 and 17°C.

The weather conditions encountered during the survey period are considered to be suitable for surveying and accessing the reptile population present. Weather conditions were recorded in detail on each visit as were all reptile observations on site, including species, age class and sex of those found.

2.3 Valuation

The value of habitat for reptiles within the survey area at Aldhurst Farm will be assessed based on both the findings of the survey results, and factors such as availability of suitable habitat and the land management regime as recommended by Beebee and Grayson (1998)[5].

3. Results

3.1 Desk Study

No site specific data is available with regard to reptile species that have been previously recorded at the Aldhurst Farm site however Leiston Common is adjacent to the east of this site, separated only by Lovers lane. A reptile survey of Leiston Common in 2002 recorded adder (*Vipera berus*), grass snake (*Natrix natrix*) and slow-worm (*Anguis fragilis*). A further presence/likely absence survey was conducted on behalf of BE during 2006[6], this focussed in part on the plantation woodland habitat of Kenton Hill which is adjacent to the north east of Aldhurst Farm, and established frequent occurrences of grass snake with more occasional observations of slow worm and common lizard.

[5] Beebee, T. and Grayson, R. (1998) Site assessment and protection. *In*: Gent, A. H. and Gibson, S. D. eds. *Herpetofauna workers' manual*. Peterborough, Joint Nature Conservation Committee, pp95-106.

[6] ADAS & SWT (2007) Sizewell Land Management Report – Annual Review 2006-2007, ADAS, Sizewell

Data from SBRC provided in 2007 indicates that all four common reptile species are widespread throughout the Sizewell Estate and beyond. All four species have been recorded within the area within the last 9 years with many recent records for common lizard, adder and grass snake. However, only seven records exist for slow worms dating back to 1980. Extensive records of common lizard, adder and grass snake exist for the land surrounding the Sizewell estate. Habitats within Leiston common and the Sizewell estate are well connected and ecologically continuous, whilst Leiston common is separated from the Aldhurst farm site by a road, this may act to limit but not wholly prevent reptile movement between these habitats.

3.2 Overview of Site Habitats

Aldhurst Farm (Grid ref. TM449 633) sits to the west of the Sizewell Marshes SSSI, separated from the SSSI by Lover's Lane which bounds the east and north of the survey area. The survey area is also bounded by Valley Road and gardens of houses on Valley Road to the south and Abbey Road (and an industrial area) to the west. The survey area comprises of 69ha of farmland of which the majority is arable; **Figure 2.1** outlines the suitable habitat for reptiles within the Aldhurst Farm site.

3.2.1 Woodland Areas

Woodland areas present within Aldhurst Farm consist of a small block of broad-leaved deciduous woodland located adjacent to a former reservoir and a mixed conifer and deciduous plantation woodland (c. 0.8 ha) with species comprising predominantly of pine (*Pinus* sp.) and willow (*Salix* sp.) located in the south east of the site. Tree lines and field boundaries on site, consist predominantly of mature lime interspersed with blackthorn (*Prunus spinosa*), field maple (*Acer campestre*), cherry (*Prunus* sp.), alder (*Alnus glutinosa*) and elder (*Sambucus nigra*). There are also a range of other mature trees located within the site, predominantly adjacent to ditches, including pollarded crack willows (*Salix fragilis*), ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*), holly (*Ilex aquifolium*) and lime.

3.2.2 Grassland Areas

The majority of habitat within Aldhurst Farm consists of arable land however small areas of grassland are present within the survey area. Rank grass can be found in narrow strips around the field margins, boundary hedges and along the banks of a main stream which crosses the site. These rank grassland strips are widest along these features in the north eastern corner of the site. An area (c. 0.8 ha) of rank, semi-improved grassland and scattered scrub comprising predominantly of bramble (*Rubus fruticosus* agg.) is located on centrally on the highest point of the survey area.

he grassland areas present within Captains Wood are largely reverted arable habitats. The swards generally represent a neutral grassland with some indicative acidic species present in areas where the improved nature of the soil has reduced in time thereby allowing acidic influence to become apparent. The grassland areas to the south of Captains Wood have been in reversion for more than 5 years and a well established, tussocky sward has become established with some encroaching scrub. Some areas

3.2.3 Waterbodies

Waterbodies consist of a deep stream with little aquatic vegetation which flows from west to east across the site. At the western end, the stream flows around the edge of a small former

reservoir located which no longer holds water and is overgrown with reed (*Phragmites australis*).

3.3 Field Survey

During the survey of artificial refugia three reptile species were recorded: viviparous lizard, grass snake and adder, both adults and juveniles were recorded for viviparous lizard and grass snake; no slow worms were recorded. A maximum adult count of seven was made for viviparous lizard, the maximum count for grass snake was two and adder one.

Viviparous lizards were the most abundant reptile species recorded and were widespread across all three key survey areas, with the greatest densities recorded in the area of semi improved grassland at the centre of the site; the distribution is illustrated in **Figure 4.1**.

Grass snakes were less widespread but were still recorded in low numbers along the eastern field margin, the wet ditch and the area of semi improved grassland. Adders were only recorded under refugia seventeen adjacent to the wet ditch by the eastern boundary; the distribution of both species of snake is illustrated in **Figure 4.2**.

Table 3.1 below summarises the results of the survey across the whole survey area. Full reptile results are presented in **Appendix B**.

Table 3.1 Summary of Reptile Survey Data

Survey	Date	Weather conditions	Reptile observations			
			Common lizards	Slow worm	Adder	Grass snakes
1	19/08/10	Cloud cover: <5%. Wind speed: Light. Ground moisture: Dry. Rain: None Temperature. 16°C	1F, 5 Juv, 2M	0	0	2 adult
2	23/08/10	Cloud cover: <5%. Wind speed: Light. Ground moisture: Dry. Rain: None Temperature. 22°C	2 Juv.	0	0	0
3	24/08/10	Cloud cover: 0%. Wind speed: Light. Ground moisture: Dry. Rain: None Temperature. 15°C	4F, 11 Juv, 1M	0	0	2 adult, 1 Juv.
4	25/08/10	Cloud cover: <5%. Wind speed: Light. Ground moisture: Dry. Rain: None Temperature. 17°C	1F, 3 Juv, 1M	0	0	0
5	27/08/10	Cloud cover: 70%. Wind speed: Moderate. Ground moisture: Dry. Rain: None Temperature. 19°C	2 Juv, 1M	0	0	0

Survey	Date	Weather conditions	Reptile observations			
			Common lizards	Slow worm	Adder	Grass snakes
6	28/08/10	Cloud cover: 20%. Wind speed: Moderate Ground moisture: Damp. Rain: Overnight Temperature. 14°C	3F, 1 Juv, 1M	0	0	2 adult
7	7/09/10	Cloud cover: 0%. Wind speed: none. Ground moisture: Dry. Rain: None. Temperature. 17°C.	4F, 3 Juv, 3M	0	0	2 adult
8	8/09/10	Cloud cover: 100%. Wind speed: Moderate. Ground moisture: Dry. Rain: None. Temperature. 19°C.	2F, 5 Juv, 3M	0	0	1 adult
9	14/09/10	Cloud cover: 20%. Wind speed: None. Ground moisture: Dry. Rain: None. Temperature. 22°C.	3 Juv, 1M	0	0	1 adult
10	15/09/10	Cloud cover: 40%. Wind speed: Light. Ground moisture: Dry. Rain: None. Temperature. 14°C.	2F, 3 Juv, 2M	0	1 F adult	1 adult
11	16/09/10	Cloud cover: <5%. Wind speed: Moderate. Ground moisture: Dry. Rain: None. Temperature. 15°C.	2F, 3 Juv.	0	0	2 adult, 1 Juv
12	30/09/10	Cloud cover: <5%. Wind speed: Light. Ground moisture: Dry. Rain: None. Temperature. 20°C.	3 Juv.	0	0	1 adult, 1 Juv
13	1/10/09	Cloud cover: <5%. Wind speed: Light. Ground moisture: Dry. Rain: None. Temperature. 15°C.	2F, 1 Juv, 1M	0	0	2 adult
14	8/10/10	Cloud cover: 30%. Wind speed: Light. Ground moisture: Dry. Rain: None. Temperature. 19°C.	2F, 4 Juv, 1M	0	1F adult	1 adult
15	11/10/10	Cloud cover: <5%. Wind speed: Light/Moderate. Ground moisture: Dry. Rain: None. Temperature. 18°C.	2F, 3 Juv, 1M	0	0	1 juv.
16	12/10/10	Cloud cover: 40%. Wind speed: Still. Ground moisture: Dry. Rain: None. Temperature. 16°C.	1F, 5 Juv, 1M	0	0	2 adult
17	13/10/10	Cloud cover: 50%. Wind speed: Light. Ground moisture: Damp. Rain: None. Temperature. 14°C.	3F, 2 Juv,	0	0	0

Survey	Date	Weather conditions	Reptile observations			
			Common lizards	Slow worm	Adder	Grass snakes
18	15/10/10	Cloud cover: 30%. Wind speed: Light. Ground moisture: Damp. Rain: None. Temperature. 16°C.	2F, 6 Juv, 3M	0	0	0
19	19/10/10	Cloud cover: <5%. Wind speed: Moderate. Ground moisture: Damp. Rain: None. Temperature. 12°C.	1F, 1 Juv.	0	0	0
20	20/10/10	Cloud cover: <50%. Wind speed: Moderate. Ground moisture: Damp. Rain: Overnight. Temperature. 11°C.	0	0	0	0
Maximum survey count per species		**Adult**	7	0	1	2
		Juvenile	11	0	0	1

3.4 Population Classification

As per Froglife's guidelines[4], the classification of the relative size of common lizard, adder and grass snake populations was assessed on the basis of maximum survey counts of adults seen by observation and/or under artificial refugia (placed at a density of up to 10 per hectare), by one person in one day. The criteria for population size, based on the Froglife guidelines are outlined in **Table 3.2** below.

Table 3.2 Classification of the Relative Size of Reptile Populations

Species	Low Population	Good Population	Exceptional Population
Common lizard	< 5	5 – 20	> 20
Slow worm	< 5	5 – 20	> 20
Adder	< 5	5 – 10	> 10
Grass snake	< 5	5 – 10	> 10

N.B. Figures in the table refer to maximum number of adults seen by observation and/or under tins (placed at a density of up to 10 per hectare), by one person in one day.

Based upon these criteria, the classification of the relative size of populations for each species within the survey area as a whole is summarised in **Table 3.3** below.

Table 3.3 Reptile Population Classification Results for Survey Area at Sizewell Power Station

Species	Maximum Adult Count	Population Classification
Common lizard	7	Good
Slow worm	0	Low
Adder	1	Low
Grass snake	2	Low

3.4.1 Valuation Summary

In accordance with Froglife guidelines, the site, supporting 3 reptile species, meets the criteria of a Key Reptile Site. It is however worth noting that the site does lie within a county known to support high populations of reptiles where suitable habitat is present, therefore the site for reptiles is not considered to be exceptional within the county of Suffolk. The habitats on site also lack ecological continuity with the wider landscape with the majority of the habitat on site being sub-optimal for reptiles, therefore the site as a whole is not thought to be of great importance to the biological conservation of all three reptile species.

4. Discussion

Common lizard, grass snake and adder have been confirmed to be present at Aldhurst Farm in low (grass snake and adder) and good numbers (vivparous lizard). Common lizard is widely distributed across the entire survey area; however greatest numbers are seen the central area of semi improved rank grassland and scattered scrub. Grass snakes were found in low densities along the stream, site boundary and semi improved grass area but were less widespread than common lizard. Adder was only recorded in one location, adjacent to the stream in the east of the site. It is thought that the central area of semi improved grassland and scrub offers optimal habitat for reptiles, providing foraging, basking and sheltering opportunities, whilst the field margins and bank side vegetation of rank grassland are too small in area and prone to agricultural disturbance to support large populations of reptile.

Suitable reptile habitat within the Aldhurst farm site is well connected and ecologically continuous due to the hedges, field margins and tree lines on site. This connectivity has allowed the area of optimal semi improved grassland in the centre of the site to be colonised by a good population of common lizards and also suggests that reptiles will have likely colonised any areas of the site which have suitable habitat.

Slow worms were not recorded during the survey which is surprising given that they are known to inhabit the wider landscape and the presence of all other common reptile species. It is likely that slow worms are present within the Aldhurst farm site but in very low densities so that they were not recorded during the survey.

The desk study found that Leiston common directly east of the site supports adder, grass snake and slow-worm, while Kenton Hill plantation woodland directly north east of the site contains grass snake, slow worm and common lizard. Previous surveys have also established that all four common reptile species are widespread throughout the Sizewell Estate and beyond. It is likely

that the reptile species recorded on site have colonised the area from more optimal habitats to the north and the east. Lovers lane and Valley road which bound the site will act to limit migration and colonisation of Aldhurst Farm site by reptiles but will not wholly stop any reptile movement from the wider landscape.

5. Conclusion

As part of proposals to convert land at Aldhurst farm into compensation habitat, reptile survey work was required to establish the presence of reptiles and if present to undertake a full population assessment. Survey work was undertaken at Aldhurst farm on areas of habitat that were considered suitable to support native reptile species. This assessment was carried out in accordance with best practice guidelines and techniques through August to October 2010.

Common lizard, grass snake and adder were recorded within the survey area. A good population of viviparous lizards were widespread across the study area with the highest densities in an area of scrub and semi improved grassland. A low population of grass snakes were less widespread across the site, while adder was only recorded in one location adjacent to a stream.

In accordance with Froglife[4] guidelines, the site, supporting 3 reptile species, meets the criteria of a Key Reptile Site. However taking into account the small size and quality of habitats present, the ecological continuity within the wider landscape and the location within a county supporting high populations of reptiles, where suitable habitat is present, the site not considered to be exceptional within the county of Suffolk. Notwithstanding this, there is still a requirement to ensure that any development works on-site comply with the legislation that relates to this species.

If the site is to be converted to the proposed compensation habitat then a specific reptile mitigation scheme would be required.

6. Mitigation

Where it is impossible to avoid all potential effects on the reptile populations, a comprehensive reptile mitigation strategy must be developed, taking into account available guidance[7,8,9], prior to any works commencing on site. Due to the seasonality of reptile activity, and the time it may take to successfully implement mitigation works, it is recommended that advice be sought from a qualified ecologist with regard to designing the strategy at least two years in advance of construction work commencing. Mitigation measures adopted will vary depending on the design of the development, but could potentially include:

- Enhancement of a receptor site – this would be carried out well in advance of any on-site mitigation.

[7] English Nature (2004). *Reptiles: guidelines for developers*. English Nature, Peterborough.

[8] Herpetofauna Groups of Britain and Ireland (1998). *Evaluating local mitigation/translocation programmes: maintaining best practice and lawful standards. HGBI advisory notes for Amphibian and Reptile Groups (ARGs).* HGBI, c/o Froglife, Halesworth.

[9] Clemons, J. and Langton, T. (1998). Species translocations. *In*: Gent, A. H. and Gibson, S. D. eds. *Herpetofauna workers' manual*. Joint Nature Conservation Committee, Peterborough, pp107-112.

- Trapping – this would consist of similar methods to the initial survey, checking artificial refugia under suitable weather conditions between April and September, and capturing any reptiles found. This would continue until a satisfactory effort had been made to remove animals from the site.

- Destructive search – this would involve undertaking a destructive search of all semi-natural habitats to be affected by the compensation scheme, where appropriate. As such a hand-search of vegetation, debris and rubble piles would take place, before a more thorough destructive search using a large excavator with a toothed bucket to gradually strip vegetation, and then the top 2cm of earth. Deeper excavations would be made, to remove any remaining tree stumps and buried rubble. A suitably qualified ecologist would supervise these works and catch any reptiles that may be disturbed.

Reptiles captured from the site during the trapping and destructive search activities would be translocated to the prepared receptor site, or suitable retained habitats on-site.

7. References

Beebee, T. and Grayson, R. (1998) Site assessment and protection. In: Gent, A. H. and Gibson, S. D. eds. Herpetofauna workers' manual. Peterborough, Joint Nature Conservation Committee, pp95-106.

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Appendix A
Full Reptile Survey Results

Key

- Site boundary
- Suitable reptile habitat
- # Reptile refugia location

0 m 200 m

Scale 1:4,000 @ A3

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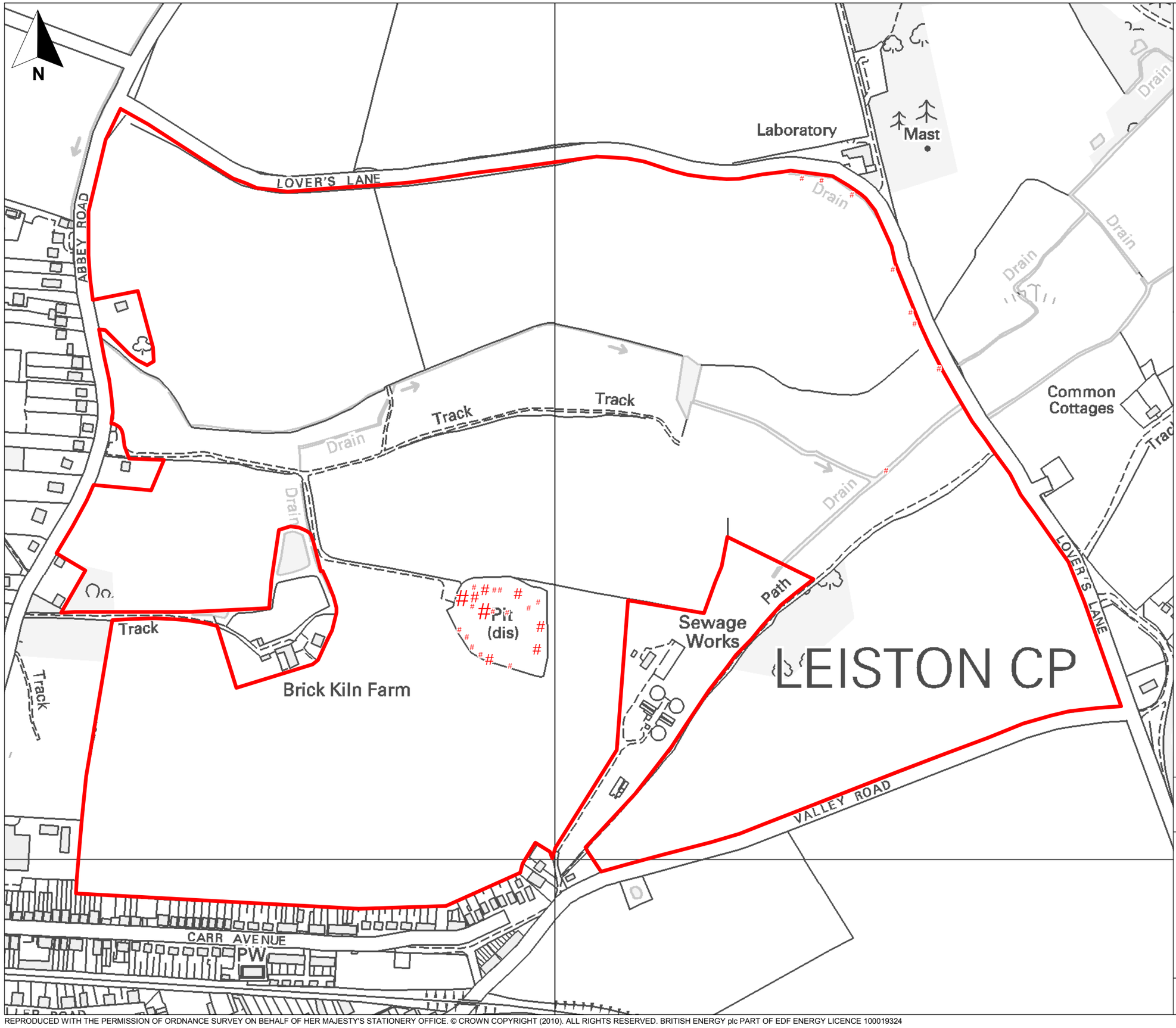
Aldhurst Farm Reptile Survey Report 2010

Figure 2.1

Approximate location of reptile refugia and suitable reptile habitat

November 2010
28130-A24.WOR tugwc

Entec



Key

Site boundary

Viviparous Lizards - Maximum count

(per day at any point during the survey period)

Total 1

Total 2

Total 3

0 m 200 m

Scale 1:4000 @ A3

Aldhurst Farm Reptile Survey Report 2010

Figure 4.1

Viviparous Lizard distribution map and Survey Area

November 2010
28130-A25.WOR tugwc

Entec

N

Laboratory

Mast

'S LANE

Drain

Drain

Drain

Track

Track

Drain

Path

Pit
(dis)

Sewage
Works

k Kiln Farm

LEISTON C

Key

Site boundary

Snakes - Maximum count

(per day at any point during the survey period)

Grass snake - Total 1

Adder - Total 1

0 m 100 m

Scale 1:2500 @ A3

EDF

Aldhurst Farm Reptile Survey Report 2010

Figure 4.2

Grass snake and Adder distribution map and Survey Area

November 2010
28130-A26.WOR tugwc

Entec

VOLUME 2, CHAPTER 14: APPENDIX 14A6 – REPTILES: ANNEX 14A6.4 PRIMARY DATA

Contents

Tables

Plates

Figures

None provided.

1. Primary Data

1.1 Introduction

1.1.1 This annex presents primary data from the Arcadis Consulting (UK) Limited (formerly Hyder Consulting, and hereafter referred to as Arcadis) 2014, 2015 and 2016 reptile surveys. Note this data has not been presented as a standalone report as the data was incorporated straight into the Technical Appendix Baseline **Appendix 14A6 - Reptiles**. It is presented here as raw for completeness. For full details of survey methodology, please refer to **Appendix 14A6 - Reptiles**.

1.2 2014 Reptile receptor site survey

1.2.1 Artificial refugia, in the form of squares of roofing felt (approximately 1 metre square (m^2)), were deployed in locations considered to have the highest potential to support reptiles in three of the proposed reptile receptor sites (Kenton Hills, St. James Covert and Broom Covert).

1.2.2 These surveys were carried out in the September/October seasonal survey window for reptiles. Refugia were allowed to 'bed in' for seven days before surveys commenced, to give sufficient time for discovery and use by reptiles. Refugia were then checked regularly between 18 September and 15 October 2014. The species, sex and age-class of any reptiles seen sheltering above and beneath the refugia were recorded.

1.2.3 Small numbers of reptiles were recorded at all three sites within the survey period. Common lizard (*Zootoca vivipara*) and slow-worm (*Anguis fragilis*) were recorded in all areas, while adder (*Vipera berus*) were only observed within the receptor site at Kenton Hills. No grass snake were recorded (*Natrix helvetica helvetica*).

Table 1.1: Receptor site survey dates and weather.

Survey Date	Weather conditions	Reptile receptor site		
		Kenton Hills	St. James Covert	Broom Covert
18/09/2014	12°C - 13°C, dry, sunny spells	1M slow-worm	None recorded	Not surveyed
25/09/2014	10°C -14°C, dry, overcast with sunny spells	1M slow-worm	None recorded	None recorded
30/09/2014	16°C, dry, sunny	None recorded	None recorded	1(A) common lizard
01/10/2014	18°C,	None recorded	None	None

Survey Date	Weather conditions	Reptile receptor site		
		Kenton Hills	St. James Covert	Broom Covert
	dry, overcast		recorded	recorded
09/10/2014	12°C-13°C, dry, sunny, still to light breeze.	None recorded	None recorded	None recorded
14/10/2014	17°C, dry, approx. 40% cloud cover, light breeze	1F, SU adder 1F, SU slow-worm 1Juv slow-worm 1(A) common lizard	1M common lizard	1F common lizard
15/10/2014	15°C, dry, 100% cloud cover, light breeze	1F, SU adder 1(A) common lizard	2F slow-worm 1Juv slow-worm 1M common lizard 1(A) common lizard	2Juv slow-worm 1F common lizard

Key: M=male, F=female, SU=sub-adult, Juv=juvenile, (A)=Adult but sex is unknown.

1.3 2015 Pillbox Field Reptile Survey

1.3.1 Surveys were carried out by Arcadis in Pillbox Field to the south of Sizewell A and B power stations, see **Figure 14A6.6**.

1.3.2 Forty-three reptile refugia were laid around the edge of this 7ha former arable field at approximately 10m intervals, on 17 August 2015. These refugia were then checked regularly between 8 September and 20 October 2015, and any reptiles seen classified to species, sex and age class as described above. Small populations of all four common reptile species were recorded within the survey period (see below).

Table 1.2: Pillbox Field site survey dates and weather.

Survey Date	Weather conditions	Reptile observations			
		Common lizard	Slow-worm	Adder	Grass snake
18/09/2015	15°C	1 SU	2 F	None recorded	1 SU
10/09/2015	16°C - 20°C, dry, sunny	None recorded	None recorded	None recorded	None recorded
14/09/2015	17°C, dry, light cloud	1 SU	None recorded	1 J	None recorded

Survey Date	Weather conditions	Reptile observations			
		Common lizard	Slow-worm	Adder	Grass snake
22/09/2015	11°C, dry, 80% cloud cover, light breeze	1 F, 1 M	None recorded	None recorded	None recorded
06/10/2015	17°C, dry, humid	None recorded	None recorded	None recorded	None recorded
12/10/2015	11°C, dry, 80% cloud cover, light breeze	None recorded	None recorded	None recorded	None recorded
20/10/2015	10°C, dry, 50% cloud cover, light breeze	None recorded	None recorded	None recorded	None recorded

1.4 2015 reptile surveys to estimate population densities at donor and receptor sites

a) Locations of the nine survey sites (shown in **Figure 14A6.6**)

Table 1.3: 2015 reptile survey site dates and weather.

Site	Site ID	Refugia distribution	Amount of habitat		Survey dates:		Number of surveys
			Area (ha)	Length (m)	Spring/ summer	Autumn	
Arable hedgerow margin	1	Linear along field margin	0.24[1]	599m	13/04/2015 - 06/07/2015	02/09/2015 - 14/10/2015	34
Conifer plantation, Goose Hill	2	Grid (10*10)	1.0	-	13/04/2015 - 06/07/2015	03/09/2015 - 13/10/2015	30
Ride habitat, Goose Hill	3	Linear along rides	0.27[1]	675m	13/04/2015 - 07/07/2015	03/09/2015 - 15/10/2015	33
Scrub habitat, Goose Hill	4	Grid (~25*4)	1.0	-	13/04/2015 - 07/07/2015	09/09/2015 - 20/10/2015	37
Open grassland/ scrub habitat, main platform	7	Irregular	0.7	-	15/04/2015 - 09/07/2015	02/09/2015 - 15/10/2015	32
Landscape plantation, main platform	8	Grid (10*10)	0.8	-	15/04/2015 - 09/07/2015	02/09/2015 - 15/10/2015	27

Site	Site ID	Refugia distribution	Amount of habitat		Survey dates:		Number of surveys
			Area (ha)	Length (m)	Spring/ summer	Autumn	
Clear fell habitat, Kenton Hills	5	Grid (10*10)	0.9	-	13/04/2015 - 07/07/2015	02/09/2015 - 14/10/2015	26
Clear fell habitat, St. James Covert	6	Irregular within reptile fencing	1.1	-	07/04/2015 - 06/07/2015	02/09/2015 - 20/10/2015	30
Former arable land, Studio Field	9	Grid	1.1	-	03/06/2015 – 15/07/2015	02/09/2015 – 20/10/2015	21

[1] Based on width of linear feature of 4m

b) Reptile survey site photographs

Plate 1.1: Reptile survey site photographs 2015.

Conifer plantation (Goose Hill): Area 2	Bracken scrub (Goose Hill): Area 4
	

Ride (Goose Hill) Area 3	Arable hedgerow margin: Area 1
	
Main platform, open grassland/scrub habitat: Area 7	Main platform, landscape plantation: Area 8
	
Kenton Hills: Area 5	St James Covert: Area 6

	
Studio Field: Area 9	
	

c) Adder and grass snake Capture-Mark-Recapture Methodologies 2015

1.4.1 In the case of adder, the unique head and neck patterns were used to identify individuals. For grass snake, the ventral scales around the cloaca were used to identify individuals. For both species, any damage or scarring (from old injuries) was also used to identify different individuals.

Plate 1.2: The distinctive patterns of adder and grass snake are shown below.

Head patterns of adder are unique to individuals and are useful for population estimates.	The ventral scale patterns of grass snake are unique to individuals and are useful for population estimates.
	

1.4.2 Where possible, capture-mark-recapture (CMR) data was analysed using Program MARK[1]. Population estimates were calculated using the POPAN formulation, which follows the Jolly-Seber mark recapture model[2]. This model was selected as it takes account of open populations and multiple trapping sessions.

1.4.3 Using the Jolly-Seber model assumes an open population, allowing individuals to both enter the population (births and immigration) and leave the population (deaths and emigration). There are a number of assumptions that need to be considered when using this model:

- animals retain their tags throughout the experiment (i.e. adders/grass snakes retain the same scale patterns);
- tags are read properly (i.e. surveyors correctly identify different individuals);
- catchability is the same for all animals (marked and unmarked) at each sampling location (homogeneous catchability);
- survival probabilities are the same for all animals (marked and unmarked) between sampling occasions (homogeneous survival);

[1] Details of the Program MARK, available at: http://www.phidot.org/software/mark/
[2] Details of the Jolly Seber mark recapture method available at: (http://oak.snr.missouri.edu/nr3110/topics/jolly.php)

- the study area is constant. If the study area changes over time then the population size many change.

d) Results

i. Capture mark recapture data

1.4.4 With regard to snakes, 54 adders and 27 grass snakes were caught and photographed for individual identification. Of these, 39 adders were different individuals (12 males, 23 females and 4 juveniles), and 20 grass snakes were different individuals. These results were used to ascertain a population number for the extent of donor habitat surveyed, and this figure has been extrapolated to provide a population estimate for the proposed development site as a whole.

1.4.5 Using the Jolly-Seber mark recapture model, the following population estimates have been made:

Adders within the scrub area of Goose Hill (Area 4)

1.4.6 There is an estimated population of 22.4 adders within the scrub area of Goose Hill. The lower 95% confidence limit is 16.2 adders, and the higher 95% confidence limit is 62.2 adders.

Adders within the main platform grassland/scrub habitat (Area 7)

1.4.7 There is an estimated population of 22.40 adders within the main platform grassland area. The lower 95% confidence limit is 16.18 adders, and the higher 95% confidence limit is 61.28 adders.

Adders within Kenton Hills east section (Area 5)

1.4.8 There is an estimated population of 5.0 adders within Kenton Hills east section. The lower 95% confidence limit is 5.0 adders, and the higher 95% confidence limit is also 5.0 adders.

Grass snakes within the arable margins (Area 1)

1.4.9 There is an estimated population of 6.0 grass snakes within the arable margins area. The lower 95% confidence limit is 6.0 grass snakes, and the higher 95% confidence limit is also 6.0 grass snakes.

ii. Non CMR population estimates

1.4.10 CMR data from snake recaptures could not be used to predict population sizes, in any of the other capture areas (Areas 2, 3, 5, 6, 8 and 9). For

these areas, population estimates were made using the total numbers of different adult individuals caught. The survey results for the different survey areas are summarised below.

iii. Donor sites

Arable margins (Area 1)

1.4.11 A "good" population of slow-worm (maximum seven adult individuals per survey) was identified within this survey site, which is located south-west of Ash Wood. In addition, nine adult grass snakes (six different individuals) were caught and photographed for CMR. No adder or common lizard were found within this site.

Goose Hill Conifer plantation (Area 2)

1.4.12 Three slow-worms (one adult, two juvenile) and one common lizard were found within this area. With the exception of one adult male slow-worm, all other reptiles were found along the edge of the conifer woodland. In addition, one small grass snake (potentially last year's young) was caught and photographed within the area.

Goose Hill Ride (Area 3)

1.4.13 A "good" population of slow-worm (maximum five adult individuals per survey), and two common lizards, were found along the rides in this survey area. Juvenile and sub-adult slow-worms were also found (maximum six per survey). Five grass snakes (two adults, three juveniles) have been caught and photographed for CMR, resulting in four different individuals being identified. One of these individuals was previously caught and photographed in the scrub survey area. One small grass snake was caught and photographed, and no adders were found.

Goose Hill Scrub (Area 4)

1.4.14 All four species of reptile identified within the wider landscape were found consistently within this area. Thirty-five adders were observed (15 different individuals identified through CMR) along with 14 grass snake records (eight different individuals caught and photographed). "Good" populations of slow-worm (maximum 15 adult individuals per survey), and a "good" population of common lizard (maximum seven adult individuals per survey) was also recorded. There was a higher proportion of female than male slow-worm (85:36), and sub-adults and juveniles of the species were also found (68 in total). There are potentially higher numbers of reptiles within this area than would be predicted from these findings, as the dense

bracken and bramble make it difficult to see individuals, especially in the case of common lizards.

Main platform grassland (Area 7)

1.4.15 A total of 22 adders have been observed in this area, all within the scrub area along the bund. Of these 22 adders, 18 were caught and photographed, and 15 different individuals were identified (five males, nine females and one juvenile). A "good" population of common lizard was also identified (maximum 11 adult individuals per survey) throughout the mid-length of the site in the long grassland, and within the scrub area, but not in the short grassland. A maximum of six adult slow-worms per survey was found, mainly on the scrub bund and also in the long, slightly wet patch of grassland. No grass snakes were observed.

Main platform landscape plantation (Area 8)

1.4.16 Low numbers of common lizards (four individual per survey) was found within the scrub area along the edge of the conifer plantation within the main platform site. In addition, one female adder was caught on two occasions from the patch of gorse scrub at the conifer plantation north east edge. No grass snake or slow-worm were found in this area.

iv. Receptor sites

Kenton Hills eastern section (Area 5)

1.4.17 Low numbers of all four common reptile species were found within the eastern section of Kenton Hills. Within this area, a maximum of one grass snake, three common lizards, eight slow-worms (four adult individuals), and five adders (one adult, four juvenile) were found per survey. Nine adders were caught and photographed for CMR within this section, of which five were different individuals (one male, three females and one juvenile). One adult grass snake was caught and photographed for CMR and was caught again at a later date.

St James Covert (Area 6)

1.4.18 A "good" population of slow-worm (maximum eight adult individuals per survey) and a "low" population of common lizard (maximum one per survey) was found within this area. The majority of slow-worm found were female (29:8), and 21 juveniles and sub-adults were also found. One grass snake was caught and photographed for CMR, and two adders were seen (one male, one female), of which one was caught and photographed.

Studio field (Area 9)

1.4.19 Reptile tins were deployed within Studio on 14/05/2015 (following the completion of mitigation work by third party in early May), and surveys commenced on 03/06/2015, once the tins had "bedded-in". A maximum of two common lizards were found per survey, and one gravid female adder was caught and photographed on two occasions. No grass snake or slow-worm have been observed within the area.

e) Population estimates

1.4.20 Using standard reptile survey population size evaluation criteria, based on maximum number of adults seen on any one survey occasion (Froglife, 1999[3]) (see below), and CMR data (where appropriate), it is possible to estimate population size/density for the nine survey sites. Survey results averaged over the six donor sites are also presented.

Table 1.4: Population size class estimates (Froglife, 1999[3]).

Species	Population size classes		
	Small	Medium	Large
Slow-worm	<10	10-40	>40
Common lizard	<5	5-20	>20
Adder	<5	5-10	>10
Grass snake	<5	5-10	>10

[3] Froglife. 1999. Reptile Survey, An introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Peterborough: Froglife.

Table 1.5: Maximum numbers of adult reptiles found per survey and population size/density estimation for each of the nine survey sites. NB CMR data is also included for snakes at three sites.

Site	Site ID	Amount of habitat		Slow-worm			Common lizard			Adder			Grass snake		
		Area (ha)	Length (m)	Max. no. adults	Population score	Density /ha	Max. no. adults	Population score	Density /ha	Max. no. adults	Population score	Density/ ha	Max. no. adults	Population score	Density/ha
Donor sites															
Arable hedgerow margin	1	0.2	599m	7	Good	29.2	0	Low	-	0	Low	-	2	Low	10.0
													6.01	Good	30.0
Conifer plantation, Goose Hill	2	1.0		1	Low	1 .0	1	Low	1.0	0	Low	-	1	Low	1.0
Ride habitat, Goose Hill	3	0.3	675m	5	Good	18.5	2	Low	7.4	0	Low	-	1	Low	3.3
Scrub habitat, Goose Hill	4	1.0		15	Good	15.0	7	Good	7.0	4	Low	4.0	2	Low	2.0
										22.4[1]	Exceptional	22.4			
Open grassland/	7	0.7		6	Good	8.6	11	Good	15.7	4	Low	5.7	0	Low	-

Site	Site ID	Amount of habitat		Slow-worm			Common lizard			Adder			Grass snake		
		Area (ha)	Length (m)	Max. no. adults	Population score	Density /ha	Max. no. adults	Population score	Density /ha	Max. no. adults	Population score	Density/ ha	Max. no. adults	Population score	Density/ha
scrub habitat, main platform										22.4[1]	Exceptional	32.0			
Landscape plantation, main platform	8	0.8		0	Low	-	4	Low	5.0	1	Low	1.3	0	Low	-
Receptor sites															
Clear fell habitat, Kenton Hills	5	0.9		4	Low	4.4	3	Low	3.3	2	Low	2.2	1	Low	1.1
										5.0[1]	Good	5.6			
Clear fell habitat, St. James	6	1.1		8	Good	7.3	1	Low	0.9	1	Low	0.9	1	Low	0.9
Former arable land, Studio Field	9	1.1		0	Low	-	2	Low	1.8	1	Low	0.9	0	Low	-

[1] Estimate by CMR for adder at Area 4 and Area 7 and for grass snake at Area 1

Table 1.6: Mean population density estimation for each of the nine survey sites. NB CMR data is also included for snakes at three sites.

	Slow-worm		Common Lizard		Adder		Grass snake	
	Mean max. adult count	Density/ ha	Mean max. adult count	Density /ha	Mean max. adult count	Density/ ha	Mean max. adult count	Density/ ha
Mean donor site score/density	5.7	12.1	4.2	6.0	1.5	1.8	1.0	2.7
Mean donor site score/density (incorporating CMR)	-	-	-	-	-	9.3	-	6.1

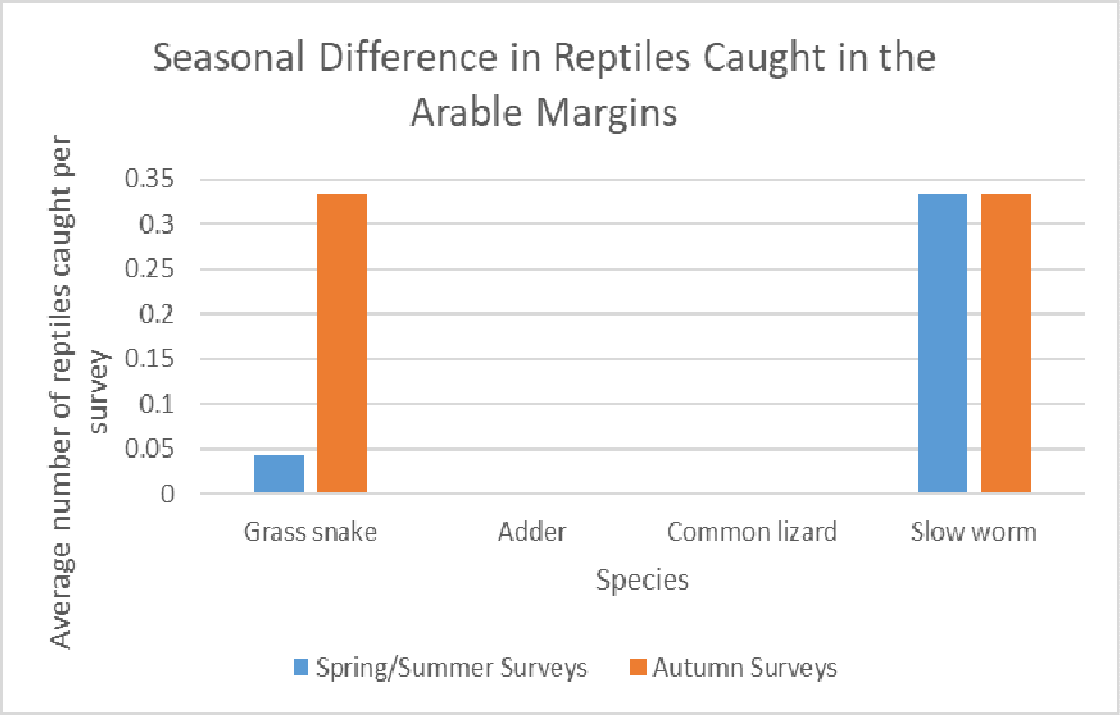
f) Seasonal variation in reptile catch

1.4.21 The subsequent diagrams show the differences in the average numbers of reptiles caught per survey during the Spring/Summer and Autumn surveys on the donor sites, with the season split between Spring/Summer (April-July) and Autumn (September-October). On all sites containing grass snake (with the exception of the conifer plantation), higher numbers of the species were caught in the Autumn survey period than the Spring/Summer survey period. This may be due to grass snake being a highly mobile species which disperse rapidly after emergence from hibernation in the Spring to waterbodies and marshy grassland, where they stay throughout the Summer, and therefore they were only being caught on their return from wetland sites to Winter hibernation quarters. With the exception of the scrub survey area, none of the survey sites are close to waterbodies which supports this suggestion.

i. Arable margin

1.4.22 For the arable margins (Area 1), the diagram below shows that more grass snake were caught in the autumn survey period (average 0.33 per survey) than the Spring/Summer survey period (average 0.14 per survey). Slow-worm captures remained the same throughout the year (average 0.33 per survey), and no adder or common lizard were found on the site.

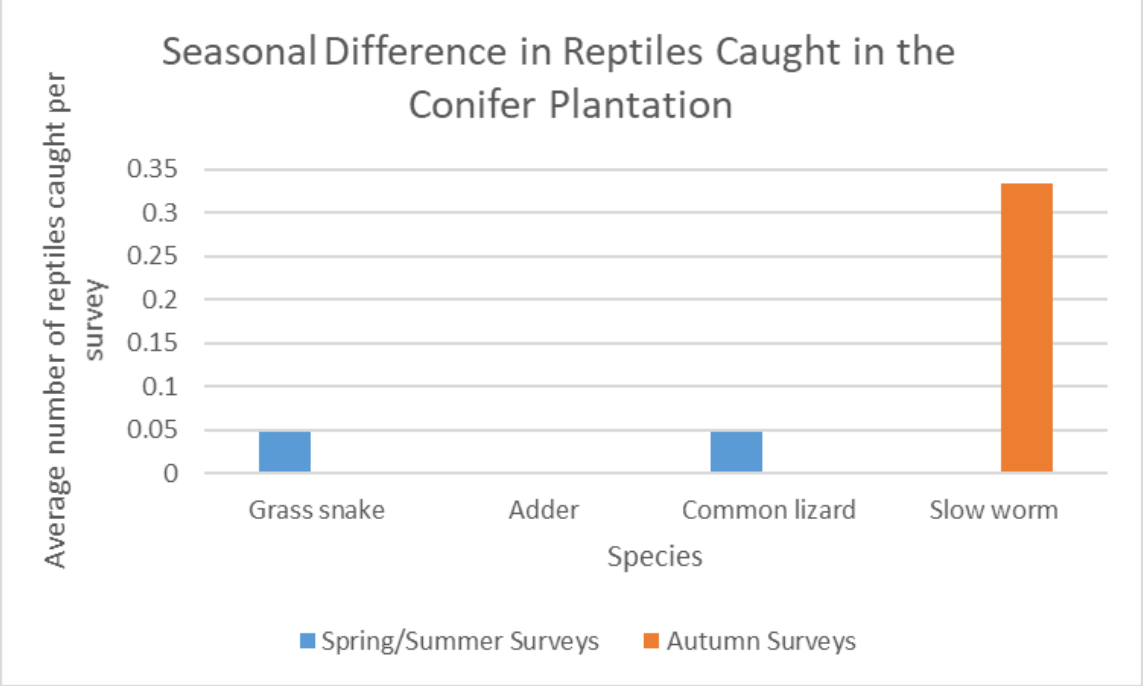
Plate 1.3: A comparison of the numbers of reptiles caught at the arable margins (Area 1) during Spring/Summer and Autumn surveying.



ii. Goose Hill conifer plantation

1.4.23 In the conifer plantation (Area 2) the diagram below shows that no slow-worm were found during the Spring/Summer survey period, whereas several (average 0.33 per survey) were found during the Autumn survey period. Although grass snake and common lizard were found during the Spring/Summer period and not the Autumn period, the numbers caught in Spring were very low (average 0.05 per survey) and so the differences between the two survey periods are not significant. No adder were caught during either survey period.

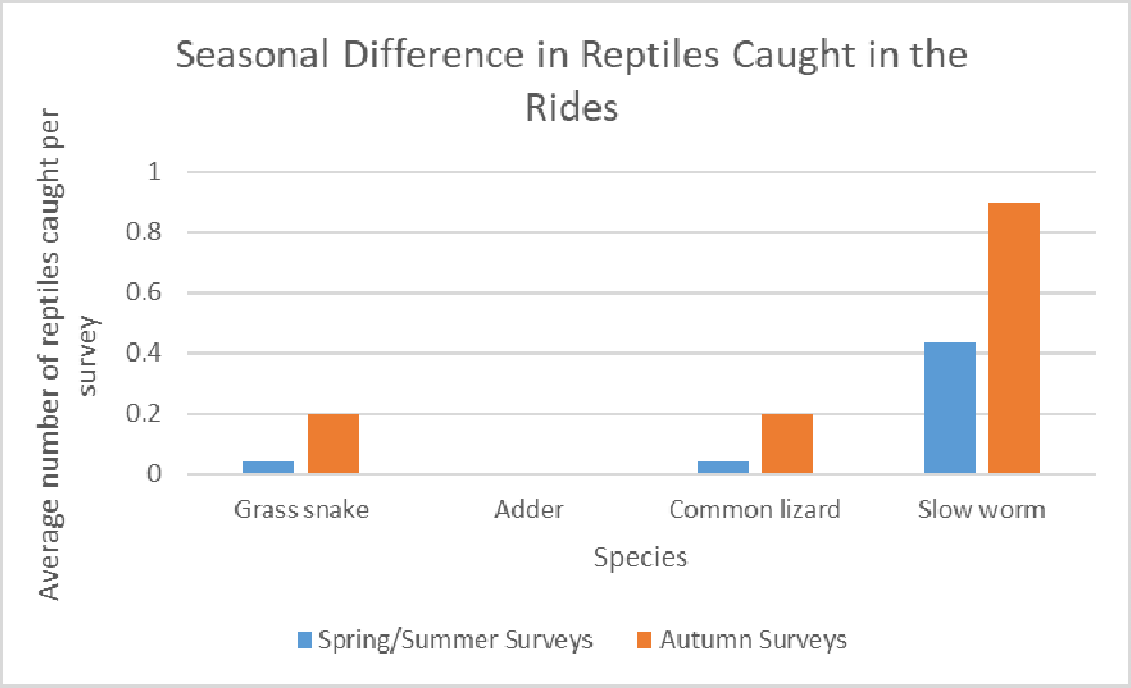
Plate 1.4: A comparison of the numbers of reptiles caught at the conifer plantation (Area 2) during Spring/Summer and Autumn surveying.



iii. Goose Hill conifer rides

1.4.24 As can be seen on the diagram below for the rides (Area 3), there were greater average capture rates of grass snake, common lizard and slow-worm during the Autumn surveys than the Spring/Summer surveys. This difference was most significant with slow-worm, with an average of 0.43 caught per survey in Spring/Summer, and 0.9 caught in Autumn. No adder were found throughout the year at this site.

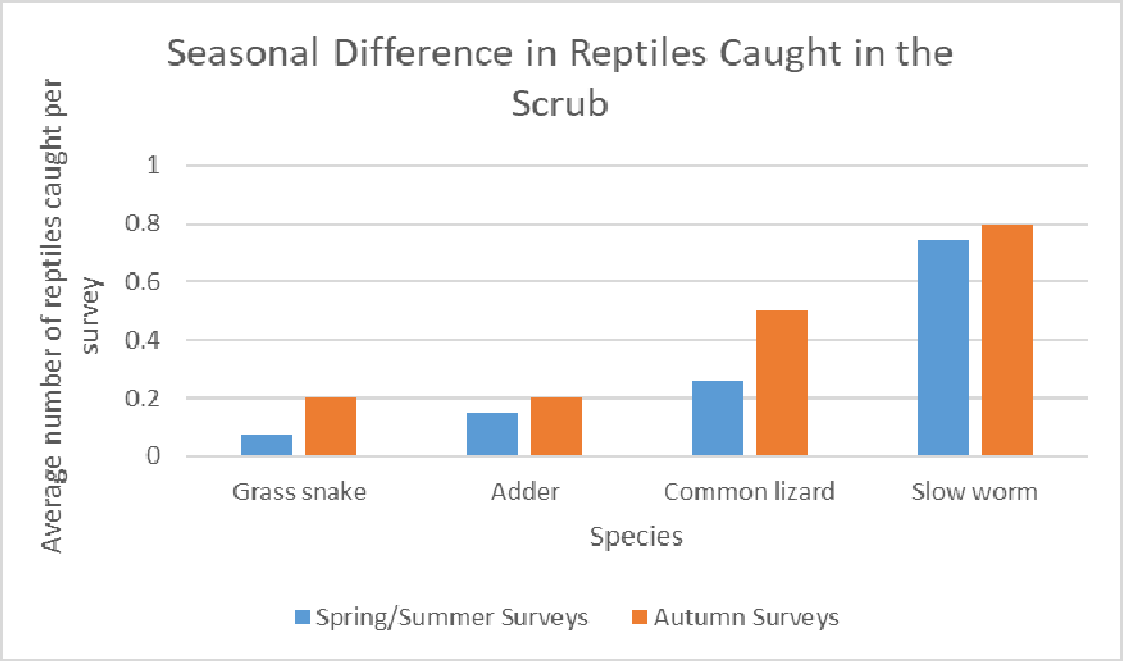
Plate 1.5: A comparison of the numbers of reptiles caught at the rides (Area 3) during Spring/Summer and Autumn surveying.



iv. Goose Hill scrub

1.4.25 The diagram below shows that in the Goose Hill scrub (Area 4) a greater average number of reptiles were caught per survey during the Autumn survey period than the Spring/Summer period for all four species. However, with the exception of common lizard (with an average of 0.26 per survey in spring/summer and 0.5 per survey in Autumn), this difference was not minimal

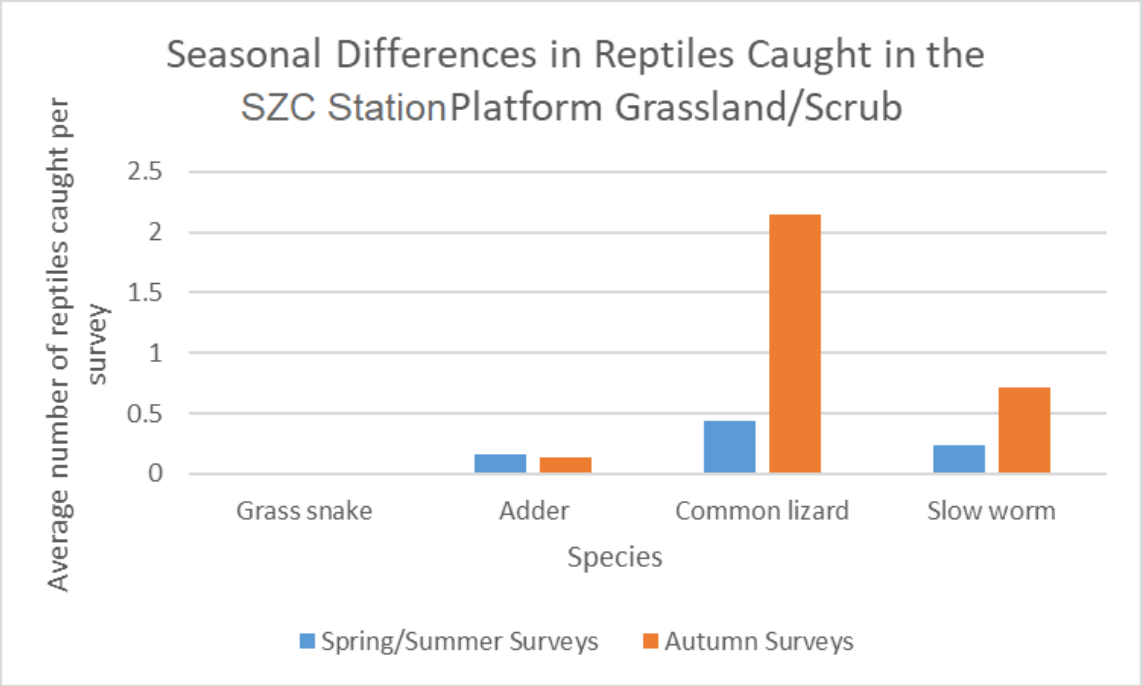
Plate 1.6: A comparison of the numbers of reptiles caught at the scrub (Area 4) during Spring/Summer and Autumn surveying.



v. Main platform grass/scrub

1.4.26 Within the main platform grass/scrub (Area 7) area, more common lizard were caught in Autumn than Spring/Summer with an average of 0.44 per survey in spring/summer and 2.14 in Autumn. Adder captures remained very similar throughout the year (average 0.16 per survey in spring/summer and 0.14 in autumn). Slightly higher average capture rates of slow-worm were found in the autumn than Spring/Summer, and no grass snake were found throughout the year.

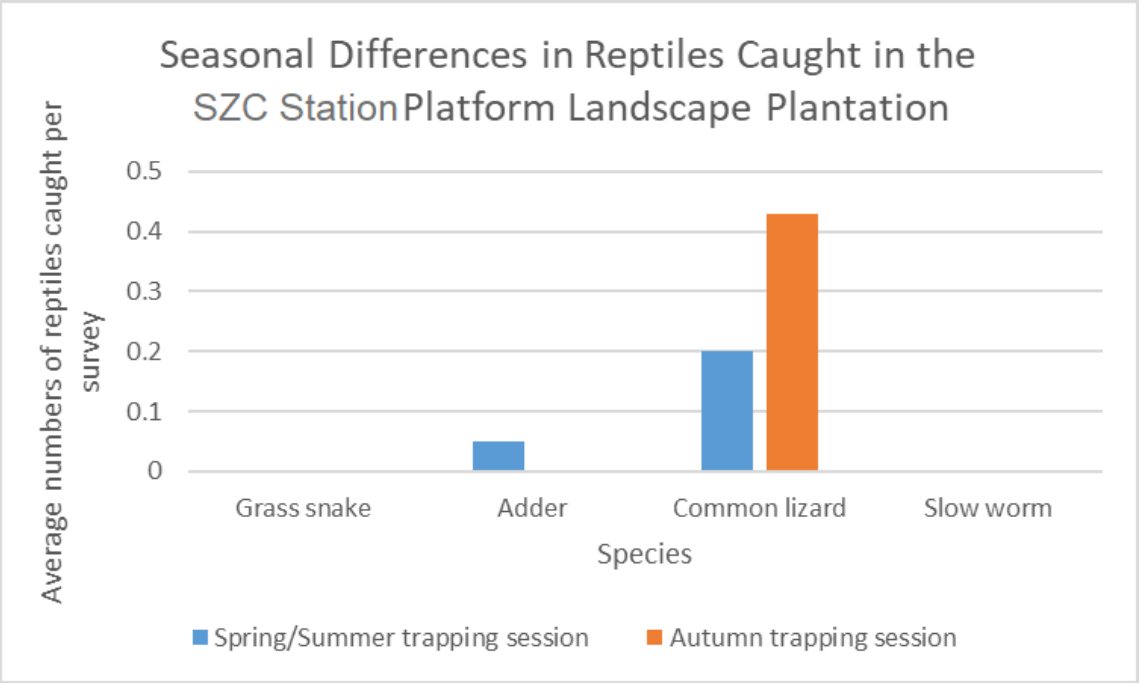
Plate 1.7: A comparison of the numbers of reptiles caught at platform grassland/scrub (Area 7) during Spring/Summer and Autumn surveying.



vi. Main platform landscape plantation

1.4.27 Within the main platform landscape plantation area (Area 8), there were greater average capture rates of common lizard in Autumn than Spring/Summer (0.2 per survey in Spring/Summer and 0.43 in Autumn). One adder was caught in Spring, whereas none were found during the Autumn period. No grass snake or slow-worm were found throughout the year on this site.

Plate 1.8: A comparison of the numbers of reptiles caught at the platform landscape plantation (Area 8) during Spring/Summer and Autumn surveying.



g) Detailed survey results

Table 1.7: Weather conditions during reptile surveys.

Date	Site	Start temp. ºC	End temp. ºC	Weather
07/04/2015	St James Covert	11	12	Dry, sunny
08/04/2015	St James Covert	11	11	Dry, sunny
13/04/2015	Scrub, Goose Hill	12	12	Dry, sunny
13/04/2015	St James Covert	12	13	Dry, sunny
13/04/2015	Rides, Goose Hill	13	13	Dry, sunny

Date	Site	Start temp. ºC	End temp. ºC	Weather
13/04/2015	Arable margins	13	13	Dry, sunny
13/04/2015	Kenton Hills West	12	13	Dry, sunny
13/04/2015	Kenton Hills East	12	13	Dry, sunny
14/04/2015	Scrub, Goose Hill	013	16	Dry, sunny
14/04/2015	Rides, Goose Hill	16	19	Dry, sunny
14/04/2015	Conifer, Goose Hill	18	19	Dry, sunny
15/04/2015	Main platform grassland	15	18	Dry, overcast
15/04/2015	Main platform plantation	19	18	Dry, sunny
15/04/2015	Scrub, Goose Hill	12	14	Dry, sunny
17/04/2015	Scrub, Goose Hill	12	11.5	Dry, sunny, patchy cloud
20/04/2015	Rides, Goose Hill	10	12	Dry, sunny, patchy cloud
20/04/2015	Kenton Hills West	14.5	13.5	Dry, sunny, clear
20/04/2015	Kenton Hills East	14.5	13.5	Dry, sunny, clear
20/04/2015	Conifer, Goose Hill	11	10	Dry, sunny, patchy cloud
21/04/2015	Arable margins	10	14	Dry, sunny, clear, moderate breeze
21/04/2015	St James Covert	14	14	Dry, sunny, clear
22/04/2015	Main platform grassland	11	11	Dry, light breeze
22/04/2015	Rides, Goose Hill	12	12	Dry, sunny, light breeze
22/04/2015	Conifer, Goose Hill	11	12	Dry, sunny, light breeze
22/04/2015	Arable margins	11	10	Dry, patchy cloud, light breeze
23/04/2015	Main platform plantation	16	18	Dry, sunny, light breeze
23/04/2015	Arable margins	10	11	Dry, overcast, light breeze
24/04/2015	Scrub, Goose Hill	14	16	Dry, sunny, clear
24/04/2015	Kenton Hills West	12	13	Dry, sunny, 20% cloud cover
24/04/2015	Kenton Hills East	12	13	Dry, sunny, 20% cloud cover
27/04/2015	Scrub, Goose Hill	14	16	Dry, sunny, 10% cloud cover
27/04/2015	Scrub, Goose Hill	13	13	Dry, sunny, 10% cloud cover
27/04/2015	Rides, Goose Hill	10	10	Dry, sunny
27/04/2015	St James Covert	23	13	Dry, sunny, 10% cloud cover
27/04/2015	Kenton Hills West	10.5	11	Dry, sunny
27/04/2015	Kenton Hills East	10.5	11	Dry, sunny
27/04/2015	Conifer, Goose Hill	9	9	Dry, patchy cloud, moderate

Date	Site	Start temp. ºC	End temp. ºC	Weather
				breeze
27/04/2015	Arable margins	11	11	Dry, sunny, patchy cloud, moderate breeze
28/04/2015	Scrub, Goose Hill	13	13	Dry, sunny, 30% cloud cover
28/04/2015	Arable margins	10	11	Dry, sunny, 30% cloud cover
28/04/2015	Kenton Hills West	9	10	Dry, sunny, clear, light breeze
28/04/2015	Kenton Hills East	9	10	Dry, sunny, clear, light breeze
29/04/2015	Scrub, Goose Hill	9	12	Overcast, light rain
29/04/2015	Rides, Goose Hill	12	13	Dry and sunny, recent heavy rain
29/04/2015	Kenton Hills West	11	11	Dry, sunny, recent heavy rain
29/04/2015	Kenton Hills East	11	11	Dry, sunny, recent heavy rain
29/04/2015	Arable margins	12	13	Dry, sunny, recent heavy rain
30/04/2015	Main platform grassland	10	11	Dry, clear, light breeze
30/04/2015	Rides, Goose Hill	13	12	Dry, patchy sun, light rain at end of survey
30/04/2015	St James Covert	13	13	70% cloud cover
05/05/2015	Main platform grassland	16	16	Dry, sunny, moderate breeze
05/05/2015	Main platform plantation	17	16	Dry, moderate breeze, 60% cloud cover
05/05/2015	Arable margins	15	16	Dry, sunny, moderate breeze, heavy rain overnight
05/05/2015	St James Covert	17	17	Dry, sunny, 30% cloud cover, moderate breeze
06/05/2015	Scrub, Goose Hill	13	13	Patchy cloud, moderate breeze
06/05/2015	Rides, Goose Hill	13	13	Patchy cloud, moderate breeze
06/05/2015	St James Covert	15	15	Dry, sunny, light breeze
07/05/2015	Conifer, Goose Hill	14	14	Dry, sunny, 40% cloud cover
07/05/2015	Conifer, Goose Hill	13	13	Dry, 90% cloud cover, heavy rain earlier in day
07/05/2015	St James Covert	13	15	Dry, sunny, 30% cloud cover
07/05/2015	Kenton Hills West	13	13	Dry, sunny, 10% cloud cover
07/05/2015	Kenton Hills East	13	13	Dry, sunny, 10% cloud cover
07/05/2015	Arable margins	15	14	Dry, light wind, 90% cloud cover

Date	Site	Start temp. ºC	End temp. ºC	Weather
08/05/2015	Main platform grassland	14	14	Dry, hazy sunshine, 60% cloud cover
08/05/2015	Scrub, Goose Hill	11	12	Dry, sunny
11/05/2015	Main platform grassland	17	20	Dry, light breeze
11/05/2015	Main platform plantation	21	22	Dry, sunny, light breeze, 10% cloud cover
11/05/2015	Scrub, Goose Hill	16	18	Dry, 80% cloud cover, light breeze
11/05/2015	Conifer, Goose Hill	18	18	Dry, sunny
11/05/2015	Arable margins	16	16	Dry, hazy sunshine with 80% cloud cover
12/05/2015	Main platform grassland	13	13	Dry, overcast, light breeze
12/05/2015	Main platform grassland	18	18	Dry, light breeze, 50% cloud cover
12/05/2015	Main platform plantation	14	14	Dry, overcast, light breeze
12/05/2015	Scrub, Goose Hill	17	16	Dry, sunny, patchy cloud
12/05/2015	Kenton Hills West	17	18	Dry, sunny, light breeze, 40% cloud cover
12/05/2015	Kenton Hills East	17	18	Dry, sunny, light breeze, 40% cloud cover
12/05/2015	Arable margins	15	15	Dry, 50% cloud cover, rain previously
13/05/2015	Main platform grassland	11	12	Dry, clear, light breeze
13/05/2015	St James Covert	15	16	Dry, sunny, clear
13/05/2015	Rides, Goose Hill	16	16	Dry, sunny, clear
13/05/2015	Conifer, Goose Hill	12	12.5	Dry, sunny
15/05/2015	Main platform grassland	12	13	Dry, 70% cloud cover, heavy rain previous night
15/05/2015	Rides, Goose Hill	13	13	Dry, 70% cloud cover, heavy rain previous night
18/05/2015	Main platform grassland	12	12	Sunny, dry, 10% cloud cover
18/05/2015	Main platform plantation	13	13	Dry, 50% cloud cover
19/05/2015	Main platform grassland	10	10	Sunny, 10% cloud cover
19/05/2015	Scrub, Goose Hill	12	12	Patchy sun, 90% cloud cover
19/05/2015	Kenton Hills West	13	14	Sunny intervals, 70% cloud cover

Date	Site	Start temp. ºC	End temp. ºC	Weather
19/05/2015	Kenton Hills East	13	14	Sunny intervals, 70% cloud cover
19/05/2015	St James Covert	12	12	Sunny, 20% cloud cover
20/05/2015	Main platform conifer	10	10	Sunny, dry
20/05/2015	Conifer, Goose Hill	11	11	50% cloud cover, sunny
21/05/2015	Scrub, Goose Hill	14	14	Sunny, clear
21/05/2015	Rides, Goose Hill	15	15	Sunny, clear
21/05/2015	Rides, Goose Hill	17	17	Sunny, 50% cloud cover
21/05/2015	Conifer, Goose Hill	14	14	Sunny, clear
21/05/2015	Arable margins	14	14	Sunny, clear
21/05/2015	Arable margins	16	16	Sunny, 30% cloud cover
26/05/2015	Main platform grassland	19	19	Dry, sunny, light breeze, 40% cloud cover
26/05/2015	Main platform plantation	17	16	Dry, sunny, 40% cloud cover
26/05/2015	Scrub, Goose Hill	15	14	Dry, 80% cloud cover
26/05/2015	Kenton Hills West	14	14	Dry, overcast, light breeze
26/05/2015	Kenton Hills East	14	14	Dry, overcast, light breeze
26/05/2015	Rides, Goose Hill	15	14	Dry, 80% cloud cover
26/05/2015	Conifer, Goose Hill	13	13	Dry, sunny, 50% cloud cover
26/05/2015	Arable margins	15	15	Dry, overcast, light breeze
27/05/2015	Main platform grassland	16	16	Dry, sunny, 30% cloud cover
27/05/2015	Main platform plantation	15	15	Dry, sunny, light breeze, 50% cloud cover
27/05/2015	St James Covert	15	17	Dry, sunny, 40% cloud cover
27/05/2015	Scrub, Goose Hill	12	14	Dry, sunny, 20% cloud cover
28/05/2015	Rides, Goose Hill	14	14	Dry, light breeze, 60% cloud cover
28/05/2015	Conifer, Goose Hill	14	14	Dry, 70% cloud cover, light breeze
28/05/2015	Arable margins	14	14	Dry, sunny, 40% cloud cover
01/06/2015	Scrub, Goose Hill	14	15	Dry, sunny, 20% cloud cover
01/06/2015	Rides, Goose Hill	15	15	Sunny, 50% cloud cover
01/06/2015	Conifer, Goose Hill	14	15	Dry, sunny, 40% cloud cover
02/06/2015	Rides, Goose Hill	21	19	Sunny, 40% cloud cover

Date	Site	Start temp. ºC	End temp. ºC	Weather
03/06/2015	Main platform grassland	17	17	Dry, sunny, 30% cloud cover
03/06/2015	Main platform plantation	17	16	Sunny, 40% cloud cover
03/06/2015	St James Covert	18	16	Sunny, 40% cloud cover
03/06/2015	Studio Field	17	17	Sunny, 40% cloud cover
03/06/2015	Conifer, Goose Hill	19	19	Dry, sunny
03/06/2015	Arable margins	22	19	Dry, sunny
04/06/2015	Main platform grassland	16	17	Dry, sunny, clear
04/06/2015	Main platform plantation	17	17	Dry, sunny, clear
04/06/2015	Scrub, Goose Hill	14	14	Sunny, clear
05/06/2015	Arable margins	17	17	Humid, 70% cloud cover, light rain
08/06/2015	Scrub, Goose Hill	14	15	Clear, sunny
08/06/2015	Rides, Goose Hill	16	17	Sunny, clear
08/06/2015	Conifer, Goose Hill	14	15	Sunny, clear
08/06/2015	Arable margins	16	16	Dry, sunny, 30% cloud cover
09/06/2015	Rides, Goose Hill	14	14	Sunny intervals, 40% cloud cover
09/06/2015	Conifer, Goose Hill	13	13	Sunny intervals, 40% cloud cover
09/06/2015	Studio Field	14.5	14.5	Sunny, 30% cloud cover
09/06/2015	St James Covert	13	14	Sunny, 40% cloud cover
09/06/2015	Kenton Hills West	14	14	Sunny, 20% cloud cover
09/06/2015	Kenton Hills East	14	14	Sunny, 20% cloud cover
10/06/2015	Main platform grassland	15	15	Sunny intervals, 50% cloud cover
10/06/2015	Main platform plantation	15	15	Sunny intervals, 50% cloud cover
10/06/2015	Arable margins	15	15	80% cloud cover
11/06/2015	Main platform grassland	15	16	Sunny, clear
11/06/2015	Main platform plantation	16	16	Sunny, clear
11/06/2015	Scrub, Goose Hill	14	14	Sunny, clear
12/06/2015	Studio Field	17	18	Sunny, clear
15/06/2015	Arable margins	14	14	Sunny, clear
15/06/2015	Kenton Hills West	13	13	Sunny, clear

Date	Site	Start temp. ºC	End temp. ºC	Weather
15/06/2015	Kenton Hills East	13	13	Sunny, clear
15/06/2015	St James Covert	13	13	Sunny, clear
15/06/2015	Studio Field	23	23	Sunny, clear
16/06/2015	Scrub, Goose Hill	18	15	Sunny, clear
16/06/2015	Rides, Goose Hill	15	15	Sunny, 70% cloud cover
16/06/2015	Studio Field	17	17	Sunny, clear
16/06/2015	Studio Field	13	14	Overcast
16/06/2015	Conifer, Goose Hill	15	15	Sunny intervals, 40% cloud cover
17/06/2015	Main platform grassland	18	18	Sunny, clear
17/06/2015	Main platform plantation	18	18	Sunny, clear
18/06/2015	Main platform grassland	15	15	Dry, 70% cloud cover
18/06/2015	Main platform plantation	14	14	Overcast, 90% cloud cover
18/06/2015	St James Covert	19	15	Sunny, 40% cloud cover
18/06/2015	Kenton Hills West	15	14	Patchy sun, 80% cloud cover
18/06/2015	Kenton Hills East	15	14	Patchy sun, 80% cloud cover
22/06/2015	Scrub, Goose Hill	15	16	Overcast, humid
22/06/2015	Rides, Goose Hill	16	16	Sunny, 30% cloud cover
22/06/2015	Arable margins	16	16	Overcast, humid
22/06/2015	Studio Field	18	18	Sunny
22/06/2015	Kenton Hills West	16	17	Sunny, 30% cloud cover
22/06/2015	Kenton Hills East	16	17	Sunny, 30% cloud cover
23/06/2015	Conifer, Goose Hill	13	13	Overcast
23/06/2015	St James Covert	14	14	Sunny
24/06/2015	Main platform grassland	17	19	Sunny, 20% cloud cover
24/06/2015	Main platform plantation	19	19	Sunny, 30% cloud cover
24/06/2015	Conifer, Goose Hill	20	20	Sunny
25/06/2015	Main platform grassland	18	19	Sunny, clear
25/06/2015	Main platform plantation	19	19	Sunny, clear
25/06/2015	Scrub, Goose Hill	16	17	Sunny, clear
25/06/2105	Studio Field	20	20	Sunny
25/06/2015	Arable margins	16	16	Sunny
01/07/2015	Main platform grassland	18	18	Sunny, clear

Date	Site	Start temp. ºC	End temp. ºC	Weather
01/07/2015	Main platform plantation	19	20	Sunny, hot, clear
01/07/2015	Arable margins	22	22	Sunny, hot, clear
02/07/2015	Main platform grassland	22	23	Sunny and hot, warm overnight
02/07/2015	Scrub, Goose Hill	19	20	Sunny, hot, overnight temperature in excess of 18 degrees
02/07/2015	Rides, Goose Hill	20	21	Sunny, hot, overnight temperature in excess of 18 degrees
03/07/2015	Conifer, Goose Hill	15	16	Sunny, clear
03/07/2015	Studio Field	18	18	Sunny, clear
03/07/2015	Kenton Hills West	15	15	Sunny, clear
03/07/2015	Kenton Hills East	15	15	Sunny, clear
03/07/2015	St James Covert	17	17	Sunny, clear
06/07/2015	Conifer, Goose Hill	19	19	Sunny, 30% cloud cover
06/07/2015	Arable margins	19	20	Sunny, 40% cloud cover
06/07/2015	St James Covert	18	20	Sunny, 15% cloud cover
06/07/2015	Studio Field	19	19	Sunny, clear
07/07/2015	Scrub, Goose Hill	19	19	Dry, 80% cloud cover
07/07/2015	Rides, Goose Hill	19	19	Dry, 80% cloud cover
07/07/2015	Kenton Hills West	21	20	Sunny, clear
07/07/2015	Kenton Hills East	21	20	Sunny, clear
09/07/2015	Main platform grassland	15	16	Sunny, 30% cloud cover
09/07/2015	Main platform plantation	15	16	Sunny, 30% cloud cover
15/07/2015	Studio Field	18	19	Sunny
02/09/2015	Main platform grassland	18	18	Sunny, dry
02/09/2015	Main platform plantation	18	18	Sunny, dry
02/09/2015	St James Covert	17	17	Sunny, dry
02/09/2015	Arable margins	15	15	Sunny, dry
02/09/2015	Studio Field	16	16	Sunny, dry
02/09/2015	Kenton Hills West	12	13	Dry, overcast
02/09/2015	Kenton Hills East	12	13	Dry, overcast
03/09/2015	Rides, Goose Hill	14	14	Overcast, dry
03/09/2015	Conifer, Goose Hill	13	13	Dry, overcast

Date	Site	Start temp. ºC	End temp. ºC	Weather
08/09/2015	Rides, Goose Hill	16	16	Dry, 95% cloud cover
08/09/2015	Conifer, Goose Hill	15	15	Dry, 90% cloud cover
08/09/2015	St James Covert	21	16	Sunny
08/09/2015	Studio Field	17	21	Sunny
08/09/2015	Kenton Hills West	16	16	80% cloud cover
08/09/2015	Kenton Hills East	16	16	80% cloud cover
09/09/2015	Main platform grassland	17	18	Sunny, dry
09/09/2015	Main platform plantation	18	19	Sunny
09/09/2015	Scrub, Goose Hill	18	18	Sunny
09/09/2015	Studio Field	20	19	Sunny, dry
09/09/2015	St James Covert	19	17	Sunny
09/09/2015	Arable margins	19	18	Sunny, dry
10/09/2015	Arable margins	19.5	19	Sunny, dry
10/09/2015	Kenton Hills West	18	19	Sunny
10/09/2015	Kenton Hills East	18	19	Sunny
11/09/2015	Main platform grassland	17	17	Sunny, dry
11/09/2015	Main platform plantation	16	15	Sunny
11/09/2015	Scrub, Goose Hill	17	17	Sunny, clear
11/09/2015	Rides, Goose Hill	17	17	Sunny
11/09/2015	Conifer, Goose Hill	17	17	Sunny
14/09/2015	Studio Field	16	14	Dry, light breeze, light rain at end of survey
15/09/2015	Main platform grassland	13	10	95% cloud cover, some light rain
15/09/2015	Main platform plantation	12	12	Overcast, dry to light rain
15/09/2015	Scrub, Goose Hill	18	19	Sunny
15/09/2015	Rides, Goose Hill	18	15.5	Dry, 25% cloud cover
15/09/2015	Kenton Hills East	15	16	Dry, 50% cloud cover
16/09/2015	Conifer, Goose Hill	14.5	14.5	Overcast, moderate breeze
16/09/2015	Arable margins	16	13.5	Overcast, occasional light rain
17/09/2015	Kenton Hills West	12	14	Overcast, then clear and sunny at the end of the survey
17/09/2015	Kenton Hills East	12	14	Overcast, then clear and sunny at the end of the survey

Date	Site	Start temp. ºC	End temp. ºC	Weather
17/09/2015	St James Covert	11.5	11.5	Overcast, dry, light breeze
22/09/2015	Main platform grassland	11	12	Dry, overcast, light breeze
22/09/2015	Main platform plantation	10	11	Dry, overcast, light breeze
22/09/2015	Scrub, Goose Hill	12.5	12.5	Dry, overcast, hazy sunshine
22/09/2015	Studio Field	11.5	11.5	Dry, overcast, light breeze
22/09/2015	St James Covert	11.5	13	Dry, 80% cloud cover, light breeze
22/09/2015	Rides, Goose Hill	14	14	Dry, overcast, hazy sunshine
22/09/2015	Arable margins	12.5	12.5	Overcast, hazy sunshine, light breeze
23/09/2015	Scrub, Goose Hill	13.5	13.5	Clear, sunny, light breeze
23/09/2015	Studio Field	12.5	12.5	Patchy cloud, light breeze
23/09/2015	St James Covert	14	14	Clear, sunny, light breeze
23/09/2015	Rides, Goose Hill	14.5	15	Patchy cloud, sunny, light breeze
23/09/2015	Conifer, Goose Hill	15	15	Sunny, patchy cloud, light breeze
23/09/2015	Kenton Hills West	14	14.5	Dry, patchy cloud, light breeze
23/09/2015	Kenton Hills East	14	14.5	Dry, patchy cloud, light breeze
23/09/2015	Arable margins	16	15	Dry, 50% cloud cover
24/09/2015	Conifer, Goose Hill	14	15	Dry, 50% cloud cover, light breeze
24/09/2015	Kenton Hills West	15	15	50% cloud cover, then clear and sunny at the end of the survey
24/09/2015	Kenton Hills East	15	15	50% cloud cover, then clear and sunny at the end of the survey
06/10/2015	Arable margins	16	16	Overcast, humid, light breeze
06/10/2015	St James Covert	16	16	Overcast, humid, light breeze
06/10/2015	Studio Field	17	18	Overcast, humid, light breeze
07/10/2015	Scrub, Goose Hill	15.5	16	Overcast, light breeze, light rain, heavy rain previous night
07/10/2015	Rides, Goose Hill	15	15	Dry, overcast, heavy rain previous night
07/10/2015	Studio Field	15	15	Overcast, light breeze

Date	Site	Start temp. ºC	End temp. ºC	Weather
07/10/2015	Conifer, Goose Hill	16	16	Overcast, humid, light breeze, light rain earlier in day
07/10/2015	Kenton Hills West	15	15	Dry, overcast, light breeze, heavy rain previous night
07/10/2015	Kenton Hills East	15	15	Dry, overcast, light breeze, heavy rain previous night
08/10/2015	Scrub, Goose Hill	13.5	14	Dry, sunny, light breeze, 10% cloud cover
08/10/2015	Rides, Goose Hill	11	11	Dry, sunny, clear, light breeze
08/10/2015	St James Covert	14.5	14.5	Dry, 10% cloud cover, sunny, light breeze
08/10/2015	Conifer, Goose Hill	12	12	Dry, sunny, 20% cloud cover, light breeze
08/10/2015	Kenton Hills West	13.5	14	Dry, sunny, 20% cloud cover
08/10/2015	Kenton Hills East	13.5	14	Dry, sunny, 20% cloud cover
08/10/2015	Arable margins	10.5	11	Dry, sunny, clear, light breeze
09/10/2015	Main platform grassland	10.5	12	Dry, sunny, light breeze
09/10/2015	Main platform plantation	10	10	Sunny, dry, cool
13/10/2015	Scrub, Goose Hill	12	12	Dry, moderate breeze, 70% cloud cover
13/10/2015	Rides, Goose Hill	12	12	Overcast, moderate breeze, dry
13/10/2015	St James Covert	11	12	Dry, 40% cloud cover, moderate breeze
13/10/2015	Conifer, Goose Hill	12	12	Overcast, moderate breeze, dry
14/10/2015	Arable margins	13	13	Dry, 50% cloud cover, on/off rain throughout the day
14/10/2015	Studio Field	12.5	12.5	Dry, 50% cloud cover, light breeze
14/10/2015	Kenton Hills West	10	11	Dry, light breeze, heavy rain previous night
14/10/2015	Kenton Hills East	10	11	Dry, light breeze, heavy rain previous night
15/10/2015	Main platform grassland	11	11	Overcast, dry, light breeze
15/10/2015	Main platform plantation	11	11	Dry, overcast, light breeze
15/10/2015	Scrub, Goose Hill	10	10	Dry, overcast, light breeze

Date	Site	Start temp. ºC	End temp. ºC	Weather
15/10/2015	Rides, Goose Hill	11	11.5	Dry, overcast, light breeze
20/10/2015	Scrub, Goose Hill	11	11	Dry, sunny, clear, light breeze
20/10/2015	Studio Field	10	11.5	Dry, 50% cloud cover, light breeze
20/10/2015	St James Covert	10	10	Dry, 50% cloud cover, light breeze

Table 1.8: Full reptile survey results. (NB? = adult of unknown sex).

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
07/04/2015	St James covert	6														1					1
08/04/2015	St James covert	6														1					1
13/04/2015	Scrub, Goose Hill	4	2	1			2	3								2	1				11
13/04/2015	Rides, Goose Hill	3					1														1
13/04/2015	Arable margins	1																			0
13/04/2015	Kenton Hills West	5																			0
13/04/2015	Kenton Hills East	5																			0
13/04/2015	St James covert	6						1													1
14/04/2015	Scrub, Goose Hill	4	2				1									3					6
14/04/2015	Rides, Goose Hill	3																			0
14/04/2015	Conifer, Goose Hill	2																			0
15/04/2015	Main platform grassland	7																			0
15/04/2015	Main platform plantation	8																			0

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
15/04/2015	Scrub, Goose Hill	4	2			1	1						1			2					7
17/04/2015	Scrub, Goose Hill	4	1													3					4
20/04/2015	Rides, Goose Hill	3														1					1
20/04/2015	Conifer, Goose Hill	2																			0
20/04/2015	Kenton Hills West	5						1													1
20/04/2015	Kenton Hills East	5																			0
21/04/2015	Arable margins	1						1													1
21/04/2015	St James covert	6						1									1				2
22/04/2015	Main platform grassland	7										1		4		1					6
22/04/2015	Rides, Goose Hill	3																			0
22/04/2015	Conifer, Goose Hill	2																			0
22/04/2015	Arable margins	1																			0
23/04/2015	Main platform plantation	8																			0
23/04/2015	Arable margins	1						1													1

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
24/04/2015	Scrub, Goose Hill	4											1			2					3
24/04/2015	Kenton Hills West	5						3													3
24/04/2015	Kenton Hills East	5																			0
27/04/2015	Scrub, Goose Hill	4											1				2				3
27/04/2015	Scrub, Goose Hill	4					1	2				1				1					5
27/04/2015	Rides, Goose Hill	3																			0
27/04/2015	Conifer, Goose Hill	2																			0
27/04/2015	Arable margins	1					1	4													5
27/04/2015	Kenton Hills West	5						2													2
27/04/2015	Kenton Hills East	5																			0
27/04/2015	St James covert	6									1					1					2
28/04/2015	Scrub, Goose Hill	4	1									1				2	1				5
28/04/2015	Arable margins	1						2													2
28/04/2015	Kenton Hills West	5						1													1
28/04/2015	Kenton Hills East	5																			0
29/04/2015	Scrub, Goose Hill	4						2				1									3

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
29/04/2015	Rides, Goose Hill	3																			0
29/04/2015	Arable margins	1					1	1													2
29/04/2015	Kenton Hills West	5						1	1												2
29/04/2015	Kenton Hills East	5																			0
30/04/2015	Main platform grassland	7										2				2					4
30/04/2015	Main platform plantation	8																			0
30/04/2015	Rides, Goose Hill	3					1														1
30/04/2015	St James covert	6						2													2
05/05/2015	Main platform grassland	7										1		2							3
05/05/2015	Main platform plantation	8																			0
05/05/2015	Arable margins	1					1	6													7
05/05/2015	St James covert	6					2									1					2
06/05/2015	Scrub, Goose Hill	4		1			1	2	1							1	1				7
06/05/2015	Rides, Goose Hill	3						1													1

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
06/05/2015	St James covert	6											1								1
07/05/2015	Conifer, Goose Hill	2																			0
07/05/2015	Conifer, Goose Hill	2														1					1
07/05/2015	Arable margins	1					1	4													5
07/05/2015	Kenton Hills West	5						3													3
07/05/2015	Kenton Hills East	5														1					1
07/05/2015	St James covert	6						4								1					5
08/05/2015	Main platform grassland	7	3									1				6					10
08/05/2015	Scrub, Goose Hill	4					2	3					2	1		1					9
11/05/2015	Main platform grassland	7	1	3												2					6
11/05/2015	Main platform plantation	8														1					1
11/05/2015	Scrub, Goose Hill	4	1	2			2	2	3								1				11
11/05/2015	Conifer, Goose Hill	2											1				1				2

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
11/05/2015	Arable margins	1						5	1								1				7
12/05/2015	Main platform grassland	7										1	1								2
12/05/2015	Main platform grassland	7											1			1					2
12/05/2015	Main platform plantation	8										3	1								4
12/05/2015	Scrub, Goose Hill	4		2			1	3								3	1				10
12/05/2015	Arable margins	1					2	5	1												8
12/05/2015	Kenton Hills West	5							1												1
12/05/2015	Kenton Hills East	5																			0
13/05/2015	Main platform grassland	7		1				1					1								3
13/05/2015	Rides, Goose Hill	3							3												3
13/05/2015	Conifer, Goose Hill	2																			0
13/05/2015	St James covert	6																			0
15/05/2015	Main platform grassland	7										1	2			2					5

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
15/05/2015	Rides, Goose Hill	3					1	1	2												4
18/05/2015	Main platform grassland	7											3			1					4
18/05/2015	Main platform plantation	8										1	1								2
19/05/2015	Main platform grassland	7										2	3			1					6
19/05/2015	Scrub, Goose Hill	4		2			3	7					1			1					14
19/05/2015	Kenton Hills West	5						1													1
19/05/2015	Kenton Hills East	5																			0
19/05/2015	St James covert	6								1											1
20/05/2015	Main platform plantation	8										1	1								2
20/05/2015	Conifer, Goose Hill	2																			0
21/05/2015	Scrub, Goose Hill	4						3													3
21/05/2015	Rides, Goose Hill	3								1											1
21/05/2015	Rides, Goose Hill	3					1	1													2

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
21/05/2015	Conifer, Goose Hill	2																			0
21/05/2015	Arable margins	1						5													5
21/05/2015	Arable margins	1						5		1											6
26/05/2015	Main platform grassland	7										2	4			3					6
26/05/2015	Main platform plantation	8																			0
26/05/2015	Scrub, Goose Hill	4		1			3	11	2	1		1									19
26/05/2015	Rides, Goose Hill	3					1	2	4	1											8
26/05/2015	Conifer, Goose Hill	2																			0
26/05/2015	Arable margins	1					2	3	1												6
26/05/2015	Kenton Hills West	5					1	4	2	1											7
26/05/2015	Kenton Hills East	5											1								1
27/05/2015	Main platform grassland	7						4			2										6
27/05/2015	Main platform plantation	8														2					2

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
27/05/2015	Scrub, Goose Hill	4	1	2		1	5	10	5			1	2			4					27
27/05/2015	St James covert	6						2													2
28/05/2015	Rides, Goose Hill	3						1	1	2											4
28/05/2015	Conifer, Goose Hill	2																			0
28/05/2015	Arable margins	1					2	3													5
01/06/2015	Scrub, Goose Hill	4					2	4	1	1						1					8
01/06/2015	Rides, Goose Hill	3						1	2												3
01/06/2015	Conifer, Goose Hill	2																			0
02/06/2015	Rides, Goose Hill	3					1	2	2	2								1			8
03/06/2015	Main platform plantation	8																			0
03/06/2015	Conifer, Goose Hill	2																			0
03/06/2015	Arable margins	1					1	2													3
03/06/2015	St James covert	6							1	1		1									3
03/06/2015	Studio Field	9														1					1

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
03/06/2105	Main platform grassland	7		1								1	1			3					6
04/06/2015	Main platform grassland	7	1									2	4								7
04/06/2015	Main platform plantation	8										1									1
04/06/2015	Scrub, Goose Hill	4					1	3	1			1					1				7
05/06/2015	Arable margins	1						1		2											3
08/06/2015	Scrub, Goose Hill	4		1			1	6		2						1					11
08/06/2015	Scrub, Goose Hill	4															1				1
08/06/2015	Rides, Goose Hill	3					1		2	1											4
08/06/2015	Conifer, Goose Hill	2																			0
08/06/2015	Arable margins	1								1											1
09/06/2015	Rides, Goose Hill	3																			0
09/06/2015	Conifer, Goose Hill	2																			0
09/06/2015	Kenton Hills West	5					3	1													4

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
09/06/2015	Kenton Hills East	5																			0
09/06/2015	St James covert	6		1																	1
09/06/2015	Studio Field	9																			0
10/06/2015	Main platform grassland	7	1	2				1		1		1	2			3					11
10/06/2015	Main platform plantation	8										1									1
10/06/2015	Arable margins	1						2													2
11/06/2015	Main platform grassland	7		1				2				3				8					14
11/06/2015	Main platform plantation	8										1				1					2
11/06/2015	Scrub, Goose Hill	4					2	1	2	1											6
12/06/2015	Studio Field	9																			0
15/06/2015	Arable margins	1					1														1
15/06/2015	Kenton Hills West	5					1	2													3
15/06/2015	Kenton Hills East	5	1																		1
15/06/2015	St James covert	6																			0

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
15/06/2015	Studio Field	9		1																	1
16/06/2015	Scrub, Goose Hill	4		2	1		2														5
16/06/2015	Rides, Goose Hill	3					1		4	1											6
16/06/2015	Conifer, Goose Hill	2																			0
16/06/2015	Studio Field	9																			0
16/06/2015	Studio Field	9																			0
17/06/2015	Main platform grassland	7		2	1			1				1	1			2					8
17/06/2015	Main platform plantation	8														1					1
18/06/2015	Main platform grassland	7		1				2	1				2			2					8
18/06/2015	Main platform plantation	8		1								1				1					3
18/06/2015	Kenton Hills West	5						1													1
18/06/2015	Kenton Hills East	5		1	1											1	1				4
18/06/2015	St James covert	6		1			1			5			1								8

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
22/06/2015	Scrub, Goose Hill	4						6	9	3		1									19
22/06/2015	Rides, Goose Hill	3					2	3	4	1		1									11
22/06/2015	Arable margins	1					2	3													5
22/06/2015	Kenton Hills West	5							1												1
22/06/2015	Kenton Hills East	5															1				2
22/06/2015	Studio Field	9		1																	1
23/06/2015	Rides, Goose Hill	3							1	1											2
23/06/2015	Conifer, Goose Hill	2																			0
23/06/2015	St James covert	6						2	1												3
24/06/2015	Main platform grassland	7		1				1				2	2								6
24/06/2015	Main platform plantation	8										1									1
24/06/2015	Conifer, Goose Hill	2																			0
25/06/2015	Main platform grassland	7		1			1	1					1								4

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
25/06/2015	Main platform plantation	8										1									1
25/06/2015	Scrub, Goose Hill	4						2	4												6
25/06/2015	Arable margins	1																			0
25/06/2015	Studio Field	9																			0
01/07/2015	Main platform grassland	7		1				1					1			1					4
01/07/2015	Main platform plantation	8																			0
01/07/2015	Arable margins	1																			0
02/07/2015	Main platform grassland	7																			0
02/07/2015	Scrub, Goose Hill	4					1	2									1				4
02/07/2015	Rides, Goose Hill	3						1	3												4
03/07/2015	Conifer, Goose Hill	2																			0
03/07/2015	Kenton Hills West	5																			0
03/07/2015	Kenton Hills East	5																			0

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
03/07/2015	St James covert	6					2														2
03/07/2015	Studio Field	9																			0
06/07/2015	Conifer, Goose Hill	2																			0
06/07/2015	Arable margins	1					1	2	1	3							1				8
06/07/2015	St James covert	6									1						1				2
06/07/2015	Studio Field	9																			0
07/07/2015	Scrub, Goose Hill	4		1	1			3	1	1											7
07/07/2015	Rides, Goose Hill	3							1	3											4
07/07/2015	Kenton Hills West	5																			
07/07/2015	Kenton Hills East	5						1													1
09/07/2015	Main platform grassland	7						1	1			1	1			1					5
09/07/2015	Main platform plantation	8		1																	1
15/07/2015	Studio Field	9		1																	1
02/09/2015	Main platform grassland	7					3	1		1		1		2		2					10

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
02/09/2015	Main platform plantation	8												1							1
02/09/2015	Arable margins	1						1									2				3
02/09/2015	Kenton Hills West	5							3												3
02/09/2015	Kenton Hills East	5					1	2													3
02/09/2015	St James covert	6																			0
02/09/2015	Studio Field	9																			0
03/09/2015	Rides, Goose Hill	3					1	3	3	1								1			9
03/09/2015	Conifer, Goose Hill	2					1			2											3
08/09/2015	Rides, Goose Hill	3						1	2	4			1								8
08/09/2015	Conifer, Goose Hill	2							2												2
08/09/2015	Kenton Hills West	5			1		1	2	9	2											15
08/09/2015	Kenton Hills East	5			1		1	3	1	1											7
08/09/2015	St James covert	6					1	7	3	3											14
08/09/2015	Studio Field	9										1									1
09/09/2015	Main platform	7						1	1	2		5	4	5	1						19

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
	grassland																				
09/09/2015	Main platform plantation	8																			0
09/09/2015	Arable margins	1						2	1								1		1		5
09/09/2015	St James covert	6					1	4	1			1									7
09/09/2015	Studio Field	9																			
10/09/2015	Arable margins	1						1									1				2
10/09/2015	Kenton Hills West	5						3		3	1										7
10/09/2015	Kenton Hills East	5					1	1		3											5
10/09/2015	Scrub, Goose Hill	4			1		3		2			1				4	1				12
11/09/2015	Main platform grassland	7			1				1			2	2	2		2					10
11/09/2015	Main platform plantation	8											1	1							2
11/09/2015	Scrub, Goose Hill	4					1	1		2			1								5
11/09/2015	Rides, Goose Hill	3					1	2	2	1			1								7
11/09/2015	Conifer, Goose Hill	2								1											1

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
14/09/2015	Studio Field	9										1		2							3
15/09/2015	Main platform grassland	7						1				3	3	2	4	1					14
15/09/2015	Main platform plantation	8																			0
15/09/2015	Scrub, Goose Hill	4	1		1			2	6			1				1	1		1		14
15/09/2015	Rides, Goose Hill	3							2	1								1	1		5
15/09/2015	Kenton Hills East	5	1		4			2		1											7
16/09/2015	Conifer, Goose Hill	2																			0
16/09/2015	Arable margins	1																	3		3
17/09/2015	Kenton Hills West	5		1					1												2
17/09/2015	Kenton Hills East	5			1			2	4			1	1			1					10
17/09/2015	St James covert	6						1													1
22/09/2015	Main platform grassland	7						3	1			2	2	1	1	1					11
22/09/2015	Main platform plantation	8											1	2							3

Date	Site	Site ID	Results																		
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
22/09/2015	Scrub, Goose Hill	4			2			2	6			2		1		1	1				15
22/09/2015	Rides, Goose Hill	3					4	1	4			1	1				1				12
22/09/2015	Arable margins	1																			0
22/09/2015	St James covert	6						1	1			1									3
22/09/2015	Studio Field	9										2		2							4
23/09/2015	Scrub, Goose Hill	4		1				4	3	1						2					11
23/09/2015	Rides, Goose Hill	3										1									1
23/09/2015	Conifer, Goose Hill	2																			0
23/09/2015	Arable margins	1						1									2				3
23/09/2015	Kenton Hills West	5					1	1	1												3
23/09/2015	Kenton Hills East	5		2			1	1	1							1					6
23/09/2015	St James covert	6						1													1
23/09/2015	Studio Field	9																			0
24/09/2015	Conifer, Goose Hill	2																			0
24/09/2015	Kenton Hills West	5			1		2	1	2												6

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
24/09/2015	Kenton Hills East	5		2	2		1	2	5				1								13
06/10/2015	Arable margins	1								1							1				2
06/10/2015	St James covert	6					1	1	2	1											5
06/10/2015	Studio Field	9																			0
07/10/2015	Scrub, Goose Hill	4					1		5					1							7
07/10/2015	Rides, Goose Hill	3							1								1				2
07/10/2015	Conifer, Goose Hill	2																			0
07/10/2015	Kenton Hills West	5						1	1												2
07/10/2015	Kenton Hills East	5		1	1				1												3
07/10/2015	Studio Field	9																			0
08/10/2015	Scrub, Goose Hill	4							2							2					4
08/10/2015	Rides, Goose Hill	3																			0
08/10/2015	Conifer, Goose Hill	2																			0
08/10/2015	Arable margins	1																			0
08/10/2015	Kenton Hills West	5					1	4	3												8

Date	Site	Site ID	Results																	
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
08/10/2015	Kenton Hills East	5		1								1									2
08/10/2015	St James covert	6						2	1			1									4
09/10/2015	Main platform grassland	7							1			3		4		8					16
09/10/2015	Main platform plantation	8																			0
13/10/2015	Scrub, Goose Hill	4						1	2												3
13/10/2015	Rides, Goose Hill	3						1	1												2
13/10/2015	Conifer, Goose Hill	2																			0
13/10/2015	St James covert	6																			0
14/10/2015	Arable margins	1																			0
14/10/2015	Kenton Hills West	5																			0
14/10/2015	Kenton Hills East	5																			0
14/10/2015	Studio Field	9																			0
15/10/2015	Main platform grassland	7						1	1			1	1								4
15/10/2015	Main platform	8																			0

Date	Site	Site ID	Results																		
			Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
			M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
	plantation																				
15/10/2015	Scrub, Goose Hill	4							1												1
15/10/2015	Rides, Goose Hill	3																			0
20/10/2015	Scrub, Goose Hill	4																			0
20/10/2015	St James covert	6																			0
20/10/2015	Studio Field	9																			0

1.5 2016 Goodrums Fen reptile survey

a) Goodrums Fen site (shown in **Figure 14A6.6**)

1.5.1 Within Goodrums Fens, 100 reptile tins were set out in suitable reptile habitat approximately 10m apart, covering an area of 1ha. Surveys were carried out between March and June 2016, with an additional survey period in August 2016.

1.5.2 To gain an insight into the numbers of grass snakes within the Goodrums Fen area, photographic identification was used for a CMR study. The ventral scales of grass snake were photographed, and individuals were measured to aid identification.

Table 1.9: 2016 reptile survey site dates and weather at Goodrums Fen

Site	Site ID	Refugia distribution	Amount of habitat		Survey dates:		Number of surveys
			Area (ha)	Length (m)	Spring/ Summer	Autumn	
Goodrums Fen	10	Grid (10*10)	1.0	-	30/03/2016 – 08/06/2016	25/08/2016	10

b) Reptile survey site photographs

Plate 1.9: Reptile survey site photographs 2016

Goodrums Fen	Goodrums Fen
	

c) Population estimate results

1.5.3 **Table 1.10** details the maximum number of each species found per survey within Goodrums Fens. An evaluation of the size and importance of reptile populations was made using criteria set out in Froglife Advice Sheet 10[4].

Table 1.10: 2016 summary reptile survey results at Goodrum's Fen

Species	Maximum number per survey	Population score
Grass snake	2	Low
Adder	5	Good
Common lizard	5	Good
Slow-worm	16	Good

1.5.4 The table above shows "good" populations of adder, common lizard and slow-worm estimated within Goodrums Fens, and a "low" population score estimated for grass snake.

1.5.5 Using CMR, four grass snakes were caught and photographed for individual identification, all of which were different individuals. Population estimates of grass snake within this area therefore could not be made using the CMR model.

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

d) Detailed survey results

Table 1.11: Full reptile survey results 2016 (NB ? = adult of unknown sex).

Date	Site ID	Results																		
		Adder				Slow-worm					Common lizard					Grass snake				Total reptiles
		M	F	Juv	?	M	F	Juv	Sub-adult	?	M	F	Juv	Sub-adult	?	Adult	Juv	Sub-adult	?	
30/03/2016	10																			0
31/03/2016	10					1	2			1										4
14/04/2016	10					5	7				1	1							2	17
26/04/2016	10					7	4	3			1									16
28/04/2016	10					5	1				1									8
11/05/2016	10					4	10	3				1							1	19
12/05/2016	10	1				3	10					1		1					1	18
24/05/2016	10	2	3	1		5	10	12	1			2		1					2	40
26/05/2016	10					5	11	8	1		1	3							1	31
08/06/2016	10		1			2	7												1	11
25/08/2016	10						3													3