Reptile Mitigation, Translocation and Enhancement Strategy

Island Road, Reading

Report ID 166-04
December 2015

the ecology Practice

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1. INTRODUCTION

1.1. REPORT SUMMARY

1.1.1. This document is a Reptile Mitigation, Translocation and Enhancement Strategy (RMTES) to provide a strategy to maintain reptile populations on land in Reading known as Island Road. There is a medium sized population of slow worm (*Anguis fragilis*) and a small population of grass snake (*Natrix natrix*) resident on the site.

1.1.2. The strategy contains details of mitigation to reduce the effects of development and operation of the site. Mitigation includes measures to protect animals from killing or injury and to protect and enhance animals and their habitat on-site for the foreseeable future.

1.1.3. The RMTES has been prepared following statutory guidance (NE 2015[1], NE 2013[2], EN 2010[3]) and good practice guidance available such as Gent & Gibson 1998[4] and Edgar *et* al. 2010[5].

1.2. SITE DETAILS

Location

1.2.1. The site lies off Island Road, Reading and is bordered to the north by the Kennet & Avon canal and to the east by the A33. Island Road forms the southern boundary.

1.2.2. The site is centred at OS grid reference SU 7097 7091. A location plan and site boundary is shown in Figure 1 below.

Site description

1.2.3. A Phase I Habitat survey was reported in EP 2014[6], and the results of this are shown in Figure 2 below. The land within the site boundary comprises a man-made raised plateau, colonised by rough grassland and scrub. To the east, undulating ground indicates some previous earthworks on the site, as well as areas of tarmac, bare ground and fly tipping/refuse. To the west, an area of open ground comprising short grass criss-crossed by motorcycle tracks is present.

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1 https://www.gov.uk/guidance/reptiles-protection-surveys-and-licences

2 Natural England 2013 Species Standing Advice: REP Reptiles. Last review 21st October 2013 [No longer available on www.gov.uk]

3 English Nature 2004. Reptiles: guidelines for developers. Cat. Code: IN15.1. ISBN 1 85716 807 0

4 Gent, A.H. & Gibson, S.D., eds. 1998 Herpetofauna Workers' Manual. Peterborough, JNCC

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

6 Ecology Practice 2014 166-04 Island Road Ecological Assessment, November 2014. A report for Evander Properties

1.2.4. The northern boundary is formed by the Kennet & Avon Canal and comprises several rows of tall poplars along the river bank. The western boundary cuts across an open area of ground comprising rutted ground made by motorcycle tracks. A hedgerow borders the applicant site along the eastern boundary and dense bramble scrub forms the southern boundary. The total site area is 8.26ha.

1.3. Consented Development Scheme

Scheme description

1.3.1. The consented development, which is due to commence in first quarter 2016, is for 24,200 sq m of floorspace for B2 and/or B8 uses. Outline planning permission was granted in August 2015 (ref: 141789), and following this Reserved Matters approved for 3 industrial/warehouse units in October 2015 (ref: 151461). Figure 3 shows the approved site layout.

1.3.2. The land outside the development footprint, known as the Outer Area, and referred to in detail in the Landscape and Ecology Management Plan (Ecology Practice 2015[7]), comprises 2.6ha. Management areas comprise a woodland corridor bordering the River Kennet that forms the northern site boundary, the Reptile Receptor Area on the eastern boundary, comprising grassland and scrub on a raised west-facing embankment.

1.3.3. The eastern side of the embankment borders the A33 and comprises a landscaped corridor of native hedgerow, shrub planting and amenity grassland. The southern site boundary bordering Island Road is a steep south-facing embankment comprising dense bramble and ruderals.

1.4. Reptile Survey, Capture & Site Enhancement works

1.4.1. This report outlines the reptile survey details, carried out in spring/summer 2014, and provides details of reptile capture effort carried out during that period and 2015.

1.4.2. Habitat enhancement works took place in September 2014 within the Reptile Receptor Area to remove dense scrub and create short grassland habitat for reptile. Trees and shrubs bordering the A33 were cut back to maintain the exterior visual amenity of the site, see Figure 3.

1.4.3. During October 2014 & 15, a destructive search was carried out across the entire site, following the 2014 reptile capture effort, in accordance with guidance provided in sections 5.5 and 5.6 of the ecological assessment (Ecology Practice 2014).

[7] **Ecology Practice 2015**. 166-04 Landscape & Ecology Management Plan. A report for Evander Properties.

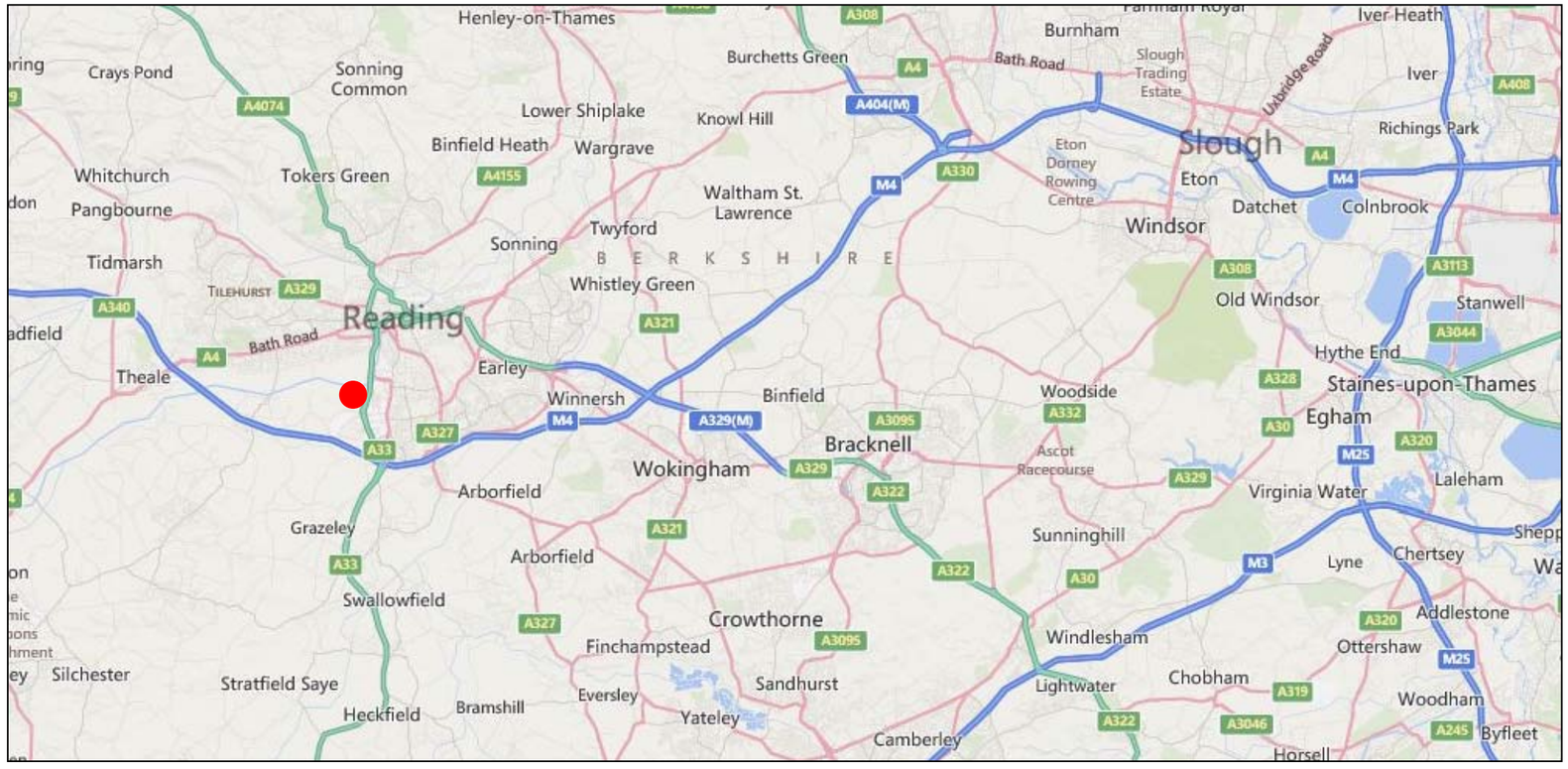

Figure 1: Location

Island Road, Reading

Legend

Site location

Application boundary

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Figure 2: Habitat Survey 2014

Island Road, Reading

Legend

- Site boundary
- Broadleaved woodland plantation
- Native hedgerow & shrub planting
- Broadleaved trees
- S.a. *Salix alba*
- P.a. *Populus alba*
- Dense scrub
- Tall ruderals
- SI Semi-improved grassland – Species-poor
- Damp grassland/swamp
- Ephemeral/short perennials
- Bare ground/refuse
- Kennet & Avon Canal
- Ditch (seasonally damp)
- Mobile phone mast
- Japanese knotweed *Reynoutria japonica*

Drawings are diagrammatic and not to scale. R architect drawings for exact measurements

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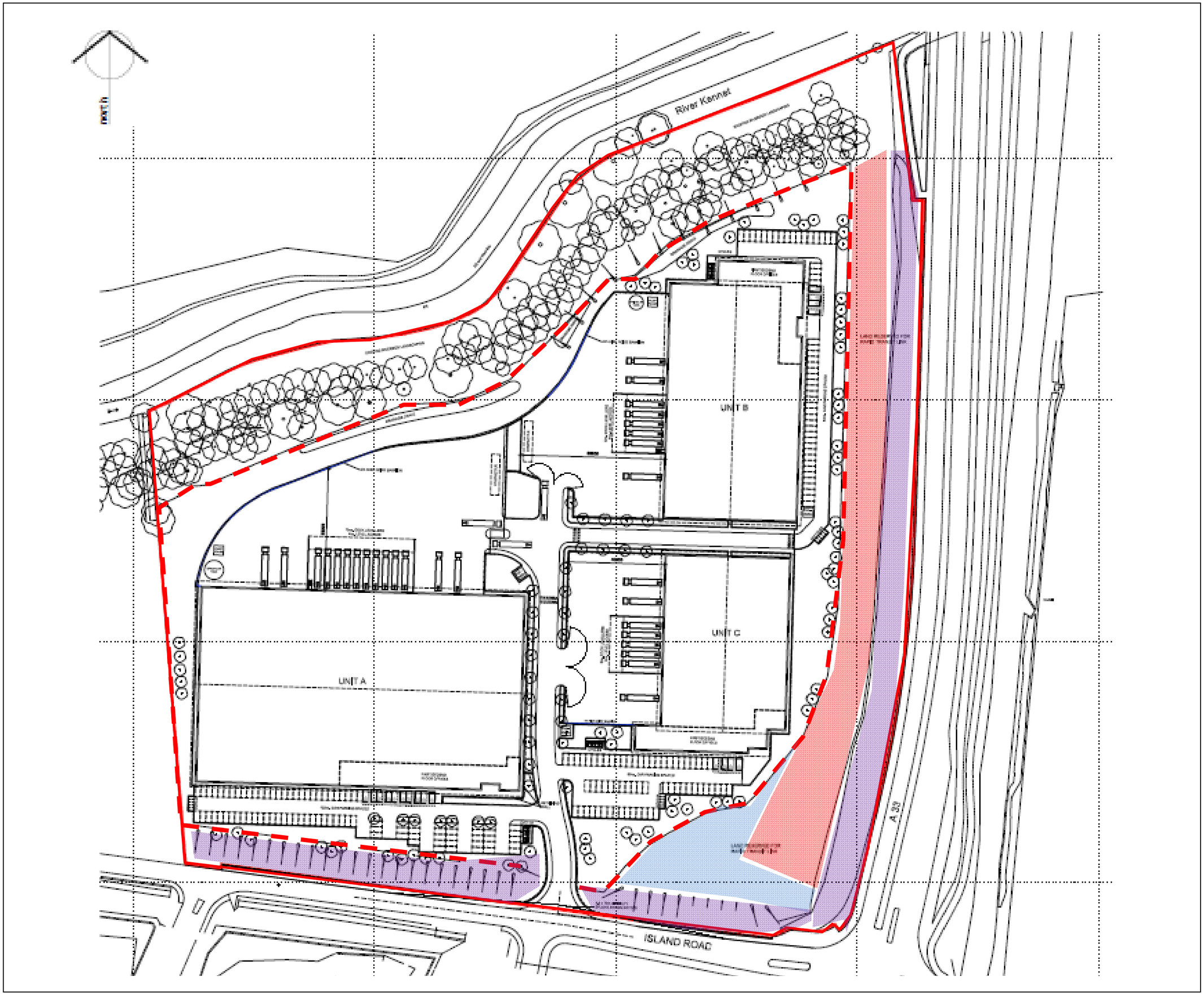

Figure 3: Proposals

Island Road, Reading

Legend

- Applicant site boundary
- Development boundary
- Reptile Receptor Area
- A33 Landscaped area
- Proposed swale grassland area

Drawings are diagrammatic and not to scale. Refer to architect drawings for exact measurements

Building layout is illustrative. Refer to drawings within the planning application for details of layout options

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1.5. Legislation and Planning

Reptile legislation

1.5.1. Both slow worms and grass snake are provided partial protection under Section 9(5) of the Wildlife and Countryside Act 1981, making it unlawful to deliberately or recklessly kill or injure an animal.

1.5.2. Natural England provides guidance in that development should take all reasonable action to avoid killing or injuring any animal (English Nature 2004). The guidance states that, where a population is occupying habitat within a development footprint, either the development must be re-designed to avoid any impact, or where this is not reasonable, then animals must be moved out of harm's way through capture and release. Animals must be moved to an area of habitat which is on-site (preferred) or an off-site receptor site (as a last resort) which is suitable for reptile colonisation. Natural England 2013 expects mitigation proposals that will:

- ensure no net loss of habitat capacity
- maintain habitat links
- secure long-term management of the site for benefit of reptiles
- include sufficient capture and translocation effort (where such measures are necessary)

Planning & Site Management

Reptile Planning Conditions

1.5.3. Both slow worms and grass snake are Priority Species nationally, and locally there is a Species Action Plan in the Reading BAP[8] for both. Development is therefore consented subject to certain Planning Conditions relating directly to reptiles; Conditions 30 and 31.

1.5.4. In preparing this strategy, our client seeks discharge of Condition 30 in Outline Planning Permission No. 141789. This Condition requires approval of a Reptile Mitigation, Translocation and Enhancement Strategy (RMTES) prior to works commencing. It aims to ensure that reptiles are protected from the adverse impacts of the development (Policies CS36 & DM17) and states that the strategy shall include:

i) The results of an up to date reptile survey carried out within 12 months of the implementation of the strategy, at an appropriate time of year, and in accordance with national best practice guidelines;

ii) Extent and location of proposed works shown on appropriate scale maps and plans;

[8] http://www.reading.gov.uk/leisureandvisitors/outdoors/Biodiversity/biodiversity-action-plan-useful-links/

iii) Persons responsible for implementing the works;

iv) Details of measures to protect reptiles during site clearance and construction;

v) The extent and location of proposed works shown on appropriate scale maps and plans;

vi) Specifications for fencing (and its maintenance) and the capture and translocation of animals;

vii) Timetable for implementation, demonstrating that works are aligned with the phasing of construction;

viii) Measures to enhance the translocation site, including the construction of hibernacula and the management of habitats;

ix) Details of the monitoring survey programme (this is to be for a minimum of 5 years following implementation of the strategy).

Other Planning Conditions

1.5.5. The scheme is subject to other planning conditions relevant to this RMTES as shown in Table 1 below. These Conditions will be discharged separately to this strategy and the RMTES should be read in conjunction with these discharge documents.

Table 1: Planning Conditions

Condition	Item	Status	Supporting Documents
29	**Construction Environmental Management Plan** with particular emphasis on management and eradication of Japanese knotweed and including measures to avoid nesting birds and other biodiversity features.	The eradication and management plan for Japanese knotweed is required by a specialist Japanese knotweed contractor. The **Landscape & Ecology Management Plan** (see S106 condition) provided by the Ecology Practice provides details with regard to timing of construction activities and the enhancement and protection of biodiversity features.	Separate report to be compiled in conjunction with approved contractor with The Ecology Practice. Ecology Practice: 166-04 Island Road, Reading Landscape Ecology Management Plan 2015.
30	**Reptile Mitigation Strategy**	Details enclosed within this document.	166-04 Ecology Practice: Island Road, Reading Ecological Assessment 2014. 166-04 Ecology Practice: Island Road,

Condition	Item	Status	Supporting Documents
			reading Landscape Ecology Management Plan 2015.
31	Implementation of the reptile strategy requires the annual reporting of the post construction monitoring survey including number, sexes and age assessments.	Details of the post construction monitoring are compiled within this document. Annual reports will be provided by the Ecology Practice who are retained as site ecologists.	To be provided as part of ongoing monitoring
32	Details relating to the dates and times of bee orchid translocation.	These works were undertaken in Spring 2015 and details provided in a letter report provided by the Ecology practice and carried out in accordance with recommendations made with the Ecological Appraisal section 5.4	Ecology Practice Letter report to Turley (27th November 2015) 166-04 Ecology Practice: Island Road, Reading Ecological Assessment 2014.
Section 106	Section 106 agreement requires that a **Landscape & Ecology Management Plan** be provided detailing the mitigation and enhancements measures for the site with respect to Ecology. This is to provide a programme of works and prescriptions for biodiversity management within the site including named parties responsible for its implementation.	Provided by The Ecology Practice – to be read in conjunction with this document.	166-04 Ecology Practice: Island Road, Reading Landscape & Ecology Management Plan 2015.

Personnel responsible for implementation of plan

1.5.6. A Section 106 Management Agreement has been entered into between the various partners. Parties responsible for implementing the site enhancement and maintenances includes the building managers and appointed landscape Management Company.

1.5.7. The Ecology Practice are retained as the site ecologists to undertake the translocation works, oversee mitigation & compensation measures and carry out the post construction population monitoring.

2. 2014 REPTILE SURVEY

2.1.1. During the habitat survey, ideal reptile habitat was recorded within the applicant site. In 2014 a reptile survey was carried out in accordance with Gent & Gibson 1998[9]. This involved setting out a matrix of artificial refugia (roofing felt and corrugated iron sheets). A total of 7 visits throughout May and June 2014 were then employed to check refugia for presence of reptiles. A plan of refugia set out for the 2014 survey is shown in Figure 4, and results are presented in section 2.2.

2.1.2. The planning authority has questioned the need for a population estimates and requested further survey visits. The additional 15 days effort (beyond that of the 7 surveys already undertaken) required is not insignificant to the project costs. Such survey effort is understood to be derived from Sewell *et al*. 2013[10]. This document follows survey protocol and accepted guidance for presence / absence surveys including 7 separate survey visits.

2.1.3. It is understood that the Local Authority Ecologists however seek an increase in survey numbers due to the low detectability of species such as sand lizard (Sewell *et al* 2012[11]). Additionally it is recorded here that Sewell *et al.* (2013) goes on to state that population estimate surveys should account for up 20 surveys but with a minimum of 6 and that these are required for mark recapture analysis only.

2.1.4. It is therefore considered that the survey effort provided is robust for the site. Firstly due to the lack of a known distribution of sand lizard within the area thus increase effort for low detectability of this species is irrelevant. Secondly the details of the survey have demonstrated effectively a population size class assessment (see section 3 of this report) in order to facilitate the appropriate mitigation method and enhancement strategy.

2.1.5. Further to this, to be satisfied that mitigation has been measured appropriately:

i) NE 2013[12] Standing Advice clearly states in 4.2 that avoidance and mitigation measures built into development proposals may remove the need for detailed survey work.

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[9] **Gent, A.H. & Gibson, S.D., eds. 1998** Herpetofauna Workers' Manual. Peterborough, Joint Nature Conservation Committee

[10] **Sewell D, Griffiths R, Beebee T, Foster J and Wilkisnon J 2013**. Survey protocols for the British herpetofauna Version 1.0

[11] **Sewell, D., Guillera-Arroita, G., Griffiths, R.A. and Beebee, T.J.C. 2012.** When is a species declining? Optimizing survey effort to detect population changes in reptiles. PLoS ONE 7(8): e43387. doi:10.1371/journal.pone.0043387

[12] **Natural England 2013** Species Standing Advice: REP Reptiles. Last review 21st October 2013.

ii) NE guidance to developers (English Nature 2004)[13] – page 11 also states, "you may not need a new survey if your ecological advisers are confident that, based on existing information and a habitat assessment, the impacts of development will be minimal, and that further survey information would neither change this view nor significantly modify mitigation proposals".

2.1.6. It is therefore considered that sufficient information is available in order to fully determine the scale of impacts and provide appropriate mitigation.

2.2. 2014 Reptile Status

2.2.1. Refugia, comprising 0.5m x 0.5m squares of corrugated steel sheet or bitumen roof felt, were set out in matrices (groups of 5) across the site in suitable locations to attract reptiles, i.e. south facing banks on dry ground, at habitat boundaries between short grass and longer vegetation occurs. The approximate density was 5-10 refuges/hectare, as per Froglife 1999[14] guidance. Figure 4 shows distribution of refugia across the site.

Slow worm

2.2.2. Survey results show slow worm to be present on the site; see Table 2 below showing a maximum count of 15 slow worm on 27th May 2014. Animals were found mostly in association with dense bramble margins, where this has connectivity with similar habitat bordering the Kennet Navigation.

Grass Snake

2.2.3. A single juvenile grass snake was consistently found to be present in the southeast portion of the site, with a single adult found in this area early in the survey during visit 2, see Table 3 below.

Population size class

2.2.4. Population size extrapolation from these survey results indicates presence of at least a good slow worm population and low grass snake population on the applicant site (Froglife 1999), see Table 4.

[13] **English Nature 2004.** Reptiles: guidelines for developers. Cat. Code: IN15.1 ISBN 185716807 0
[14] **Froglife 1999.** *Froglife Advice Sheet 10. Reptile Survey*. November 1999.

Figure 4: 2014 Reptile Survey: Refugia set out

Island Road, Reading

Legend

Applicant site

Area 1 — No reptiles recorded

Area 1 — Reptiles recorded

Total no. refugia: 155

Reptile fencing (sept 2014)

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Table 2: 2014 Slow worm survey data

Visit	1	2	3	4	5	6	7
Date	09/05/2014	13/05/2014	19/05/2014	27/05/2014	29/05/2014	03/06/2014	10/06/2014
Weather	Light rain	Sunny/ showers	Sunny, breezy	Overcast, after rain	Overcast, after rain	overcast, brightening	sunny, windy
Temp ^{0}C	15	14	21*	15	17	15	21*
Area	**SLOW WORM NUMBERS**						
1	1 x Juv	2 x Juv	1 x Juv	3 x Juv	2 x Juv	1 x Juv	
3				1 x Female		1 ♂	
3a				1 x Female	1 x Juv		
4	1 x Female	1 ♂	1 x Female		2 x Female	2 x Female	1 x Female
5				1 x Female		2 x Female	
6	1 x Female						
15				1 ♂, 3 x Juv	1 ♂, 3 x Female, 2 x Juv	3 x Female, 2 x Juv	1 x Female
21				1 ♂, 1 x Juv		1 x Female	
22			1 x Female	2 x Female	3 x Female	1 x Female	2 x Female
23				1 x Female			1 x Male
TOTAL	**3**	**3**	**3**	**15**	**14**	**13**	**5**

*Higher temperature visits are maximum peaks and follow colder period of rain, in accordance with Froglife 1999.

Table 3: 2014 Grass snake survey data

Visit	1	2	3	4	5	6	7
Date	09/05/2014	13/05/2014	19/05/2014	27/05/2014	29/05/2014	03/06/2014	10/06/2014
Weather	Light rain	Sunny/ showers	Sunny, breezy	Overcast, after rain	Overcast, after rain	overcast, brightening	sunny, windy
Temp ^{0}C	15	14	21	15	17	15	21
Area	**GRASS SNAKE NUMBERS**						
3	1 x Juv	1 x Juv	1 x Juv				
4		1 x Adult		1 x Juv	1 x Juv	1 x Juv	
TOTAL	**1**	**2**	**1**	**1**	**1**	**1**	**0**

Table 4: Reptile population size class status (after Froglife 1999)

	Low	Good	Exceptional
Slow worm	<5	5-20	>20
Grass snake	<5	5-10	>10

3. REPTILE MITIGATION SCHEME

3.1.1. From 2014, the Ecology Practice was instructed to implement a mitigation strategy at this site to include habitat creation and enhancement and include reptile translocation into a receptor area within the site. Following discussions with the LPA ecologist a strategy for retention of the population on site was considered the preferred option rather than to translocate to an entirely new receptor off site. it was therefore necessary to;

- Ensure reptiles were not killed/ injured during construction
- Ensure favourable conservation status is maintained and where possible improved as a result of the development.

3.1.2. In order to satisfy the requirements detailed above the Receptor Area was prepared in August 2014 to ensure that upon commencement of construction (following discharge of reserved matters) the receptor area habitat was capable of supporting the local population of slow worm and grass snake.

3.1.3. Reptile fencing comprising plastic sheeting with wooden stakes was secured around the perimeter of the development area isolating the receptor site from the development site. The fence was installed in accordance with minimum industry standards with fence installed vertically above and below ground, extending to 50cm above ground and installed in August 2014.

3.1.4. Artificial refugia were deployed within both the development area and the receptor site to translocate the reptiles and provide continued monitoring within the receptor area. Figure 4: 2014 Reptile Survey: Refugia set out identifies the reptile fence location and refugia locations.

3.1.5. Reptiles were translocated from the development area in September & October 2014 & 2015. Capture effort continued until the first frost in November 2014. This was completed under the instruction that the development works were to commence in 2015 (subject to reserved matters discharge).

3.1.6. All works were carried out in accordance with legislation regarding to reptiles and the habitat enhancement strategy targeted to improve habitat condition within the Reptile Receptor area (Figure 3, Figure 9) to provide continuity of habitat and improvements to surrounding land.

3.2. TRANSLOCATION

2014 Translocation

3.2.1. A total of 30 days of translocation was carried out during optimal weather conditions from between 21st September to the 1st November 2014.

3.2.2. A total of 20 slow worm were captured and translocated in 2014, over a 30 day capture period. All reptiles were caught during the first 11 days of trapping. This included 3 male, 8 female, 6 unidentified adults and 3 juveniles, see Table 5, Appendix 2. No grass snake were caught during the 2014 capture effort. No animals were caught for an extended period of 19 consecutive suitable days after the 11th visit.

3.2.3. NB. October 2014 was unusually mild and weather and temperatures were suitable throughout the capture period. There were in excess of 5 days with no captures (total 19 days no captures), but checks were continued in an attempt to ensure all animals were relocated, whilst temperatures were above 9°C and sunny.

2015 Translocation

3.2.4. A review of the reptile fence condition was undertaken on an ad-hoc basis during the period of 2014-2015. Initially works were to commence in early 2015, however this extended through 2015 until 2016 and allowed further targeted[15] translocation in 2015.

3.2.5. An additional capture programme was initiated from the 19th August to the 20th of October 2015 in targeted habitat suitable for reptiles, see Figure 6, remaining following habitat removal across the site during the previous destructive search (see 3.4.1 onwards below) and capture programme. An additional 17 capture visits were carried out, to add to the 2014 capture effort (30 days).

3.2.6. A total of 36 individual slow worm (including 2 male, 15 female, and 19 juvenile slow worm and a single juvenile grass snake were translocated from the development area, with a maximum count of 9 slow worm (08/09/15). The results are shown in Figure 9 and Table 6, Appendix 2.

[15] Translocation from areas of most suitable habitat that remained following destructive search.

3.3. MONITORING

3.3.1. Monitoring within the Receptor Area recorded a total of 67 individuals, with a maximum count of 16 slow worm on the first visit (19/08/15) comprising 3 male, 5 female and 8 juveniles. It was not feasible to carry out mark-recapture analysis as part of the 2015 surveys, and as such it is anticipated a number of individuals were recaptured based on the locations of observation. The data are shown in Figure 9 and Table 6, Appendix 2.

3.3.2. It is considered that the increase in numbers within the 2015 surveys of the receptor can be attributed in part to the success of the site enhancement measures already provided. In particular, the increase in refuge and hibernation sites.

3.3.3. Herpetofauna winter mortality can be one of the primary drivers in species decline due to the specific requirements required for overwintering. Additional refugia will provide a valuable egg laying areas away from predation. Both over winter mortality rates and young survival should be bolstered immediately by the improvements already made.

3.4. DESTRUCTIVE SEARCH

3.4.1. All Destructive Search methods follow HGBI 1998[16].

2014/15

3.4.2. A destructive search of all areas was carried out in 2014, including hand searching of vegetation by an ecologist, before and after clearance.

3.4.3. Some areas of bramble which were not cleared due to frost at site margins where reptiles had been recorded were retained for additional capture effort to take place in 2015. These areas are shown in Figure 5.

2015/16

3.4.4. A small area of land was not removed through destructive search in 2014 due to frost in late October 2014 (see Figure 5) and therefore translocation was extended to 2015.

3.4.5. In addition, before works commence on site, an Ecologist will inspect the site for reptiles and undertake supervision of brash and scrub removal. As part of this element of works, destructive

[16] **Herpetofauna Groups of Britain & Ireland 1998**. Evaluating local mitigation/translocation programmes: Maintaining best practice and lawful standards. HGBI advisory notes for amphibian and reptile groups (ARGS)

searches will be undertaken as a final precaution in the extremely unlikely event that any reptiles have evaded the translocation effort.

3.5. HABITAT ENHANCEMENTS

3.5.1. The habitat enhancement strategy (as detailed within Island Road Landscape Ecology and Management Plan: Outer Areas, Ecology Practice 2015) provides details on habitat enhancement and improvement measures including those specific to reptiles. Figure 9 provides illustrative plans for the areas specific to reptiles.

3.5.2. Initial vegetation clearance within the reptile receptor area took place in September 2014, under supervision of an ecological clerk of works. A large area of dense bramble and blackthorn scrub was removed to open out the grassland habitat on the eastern embankment, see Figure 9.

3.5.3. In September 2015, further bramble and tall ruderal control was undertaken to maintain patches of short sward grassland in areas with open, south facing aspects, such as at the top of the embankment, see Figure 9.

3.5.4. To date the enhancements within the receptor area have been implemented as detailed below to ensure a sufficient receptor area was in place prior to construction activities to provide continuity of habitat and protect the conservation status of the local reptile population.

3.5.5. The habitat creation and enhancement strategy takes into account the following:

i) Reptiles prefer a varied vegetation structure, including areas of shorter grass and bare ground for basking, and taller grasses and herbs/shrubs to provide cover.

ii) Consideration of refuge and hibernation requirements for reptiles to improve over winter survival and egg laying / young survival rates.

3.5.6. The enhancement strategy has included 4 core areas with regard to reptiles:

- Grassland management
- Scrub management
- Creation of hibernacula and refugia
- Reptile monitoring programme

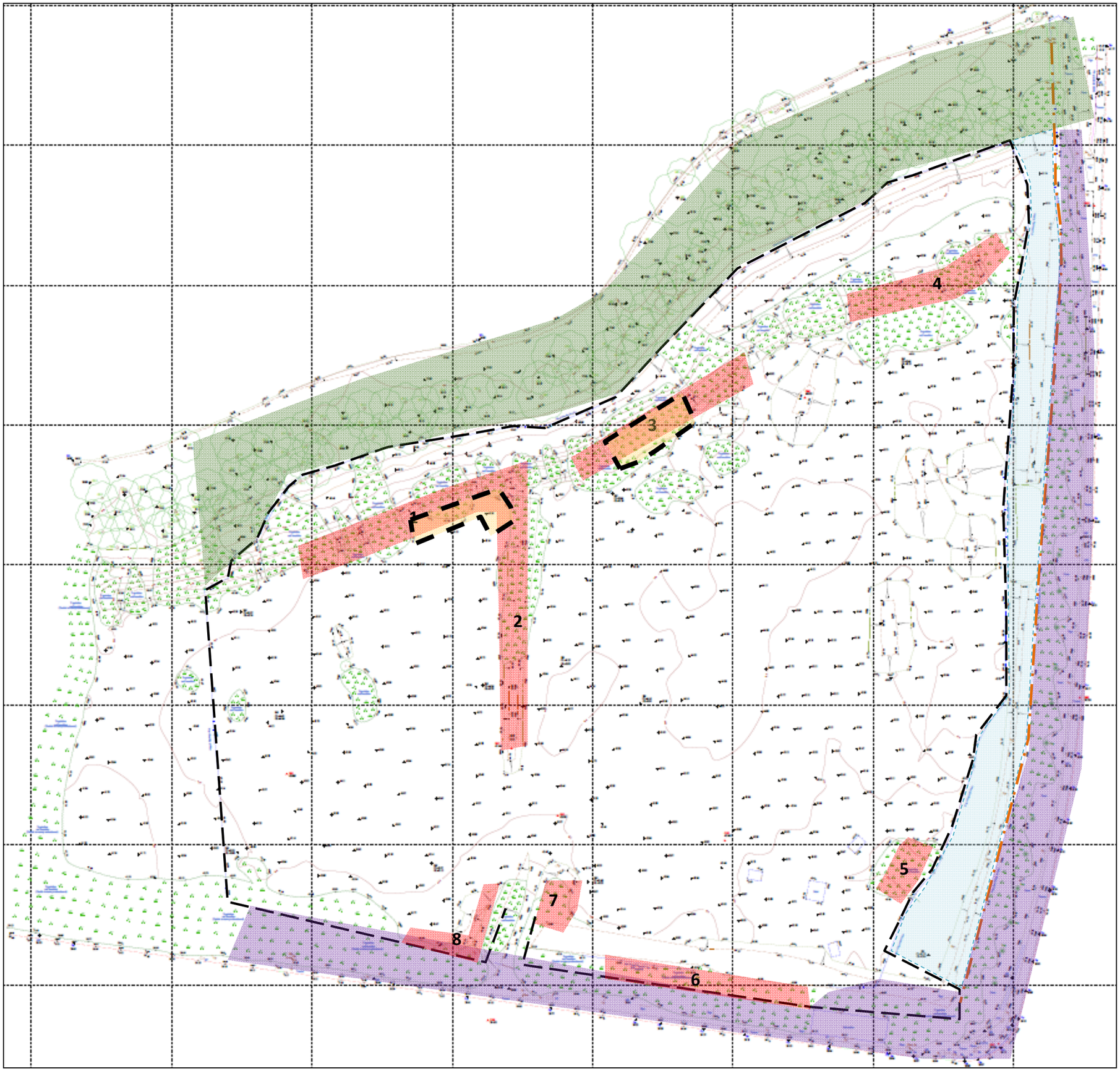

Figure 5: Reptile capture areas 2015

Island Road, Reading

Legend

Potential presence of reptiles – habitat to be destructively searched in 2014

Reptile Receptor Area – areas of dense bramble and blackthorn scrub cleared Sept 2014 & Sept 2015.

A33 landscaped corridor: Hedgerow and trees trimming & tidying Sept 2014.

River Kennet/Woodland corridor

Area not included in 2014 Destructive Search

Reptile fence

Post & rail fence

Drawings are diagrammatic and not to scale. Refer to architect drawings for exact measurements

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Figure 6: 2015 Reptile Capture: Refugia set out

Island Road, Reading

Legend

Applicant site

Area 1 — No reptiles recorded

Area 1 — Reptiles recorded

Total no. refugia:
Development area: 60
Receptor area: 70

Reptile fencing

Reptile Receptor Area

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04/11/15			

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Figure 7: Reptile capture areas 2014-15

Island Road, Reading

Legend

SW	Slow worm *Anguis fragilis*
GS	Grass snake *Natrix natrix*
	Reptile exclusion fence
	Reptile Receptor Area

Drawings, boundaries etc. are indicative.
Please refer to Architect drawings

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3.6. Management recommendations for Reptile Receptor Area

Grassland management for reptiles

3.6.1. Reptiles favour grassland with varied sward height, including areas of shorter grass and bare ground for basking, and tall grass/scrub margins to provide shelter. South-facing edge habitats comprising open areas of short grass, next to areas of longer grass and bramble and scrub, are favoured as basking areas.

3.6.2. Grassland management will comprise annual strimming of grassland and bramble on the Reptile Receptor Area to keep tall ruderals in check and maintain areas of open, shorter grass. A patchy mosaic pattern of brambles/long grass/short grass habitat is the overall aim. Annual management should seek to cut approx. 1/3 of grassland areas annually on rotation, such that there are always some areas left undisturbed. Key management areas will be identified by an Ecological Clerk of Works prior to strimming.

3.6.3. Grassland cutting height will never be lower than 15cm, to ensure that no animals are harmed by machinery blades. Particular care will be taken when trimming tussocky grasses that could be used by sheltering animals.

3.6.4. Timing: Grass cutting will be carried out in late July/August. Mowing/strimming operations carried out in areas where reptiles are present will only be carried out during periods of warm weather when reptiles are active and able to easily move out of harm's way.

3.6.5. Arisings will be stored on site: designated compost piles will provide egg-laying sites for grass snake and slow worm (see Figure 9). These will be situated in sheltered south-facing locations.

Scrub management for reptiles

3.6.6. Dense scrub comprising bramble banks and blackthorn thickets are present on the western sloping banks and eastern edge/bank top area within the Reptile Receptor Area. This edge habitat between grassland and bramble is favoured by basking reptiles. Management of bramble will be required to prevent the embankment reverting to complete cover of dense bramble.

3.6.7. The aim of management is to achieve a mosaic of bramble and grassland habitat. Annual management will seek to cut approx. 1/3 of the scrub cover annually, such that there are always some areas are left undisturbed. Key areas for management will be identified annually by an ecologist prior to strimming.

3.6.8. Timing: Bramble and scrub clearance operations will take place late August/September and must avoid the bird breeding season, April-July inclusive.

Hibernaculae and refugia

3.6.9. Three hibernacula were constructed within the receptor site in September 2014, see Figure 9, at the north, centre and south end of the eastern embankment, in accordance with the design proposed in Edgar *et al*. 2010[17]. These are partially buried piles of rubble, logs and woody material that provide below-ground shelter for over-wintering reptiles. Additional habitat piles of logs and brash from woodland management operations will be created within the reptile receptor area, at south-facing locations.

3.6.10. Refugia (comprising bitumen roof felt tiles and tin sheets) have been set out across the Reptile Receptor Area as part of the reptile monitoring programme. These provide warm basking spots for grass snake and slow worm in sunny south-facing areas close to long grass/bramble margins.

3.6.11. When carrying out any management operations, such as strimming or raking of cut material, care must be taken around hibernacula and refugia in order to avoid disturbance or harm to resting/basking reptiles.

Reptile fence maintenance

3.6.12. There will be regular checks to ensure fence condition over winter 2015/16 and during the construction phase. Once construction works are complete the fence will be removed.

A33 Embankment

3.6.13. The east facing embankment bordering the eastern edge of the Reptile Area is a separately managed area of short, amenity grassland and hedgerow/trees. For details relating to management of this area, please refer to the Island Road, Reading: Landscape and Ecology Management Plan for Outer Areas.[18]

Reptile population monitoring

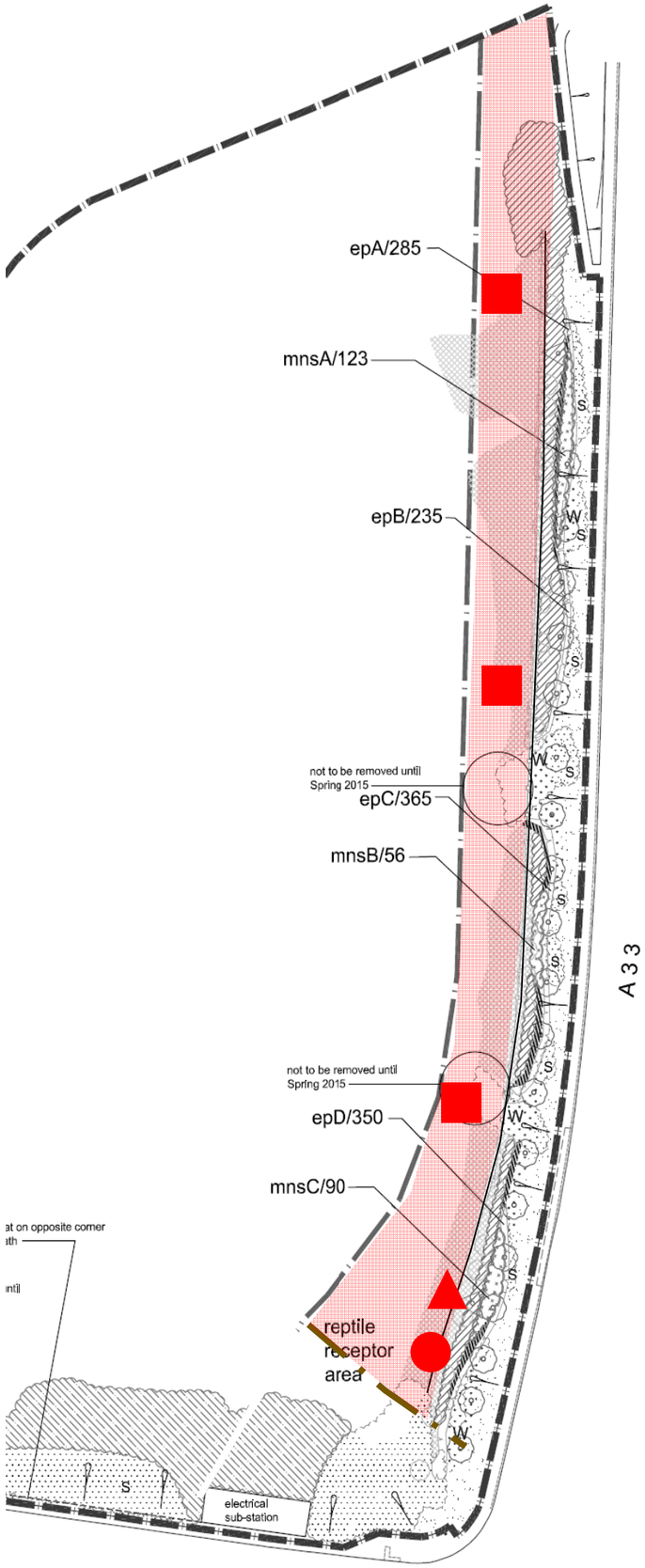
3.6.14. Monitoring of grass snake and slow worm populations will be carried out for the first 5 years and this will give a good indication of translocation success. We recommend that for 4 years post-

[17] **Edgar P., Foster J., Baker J. 2010.** Reptile Habitat Management Handbook. Amphibian and Reptile Conservation. Bournemouth.

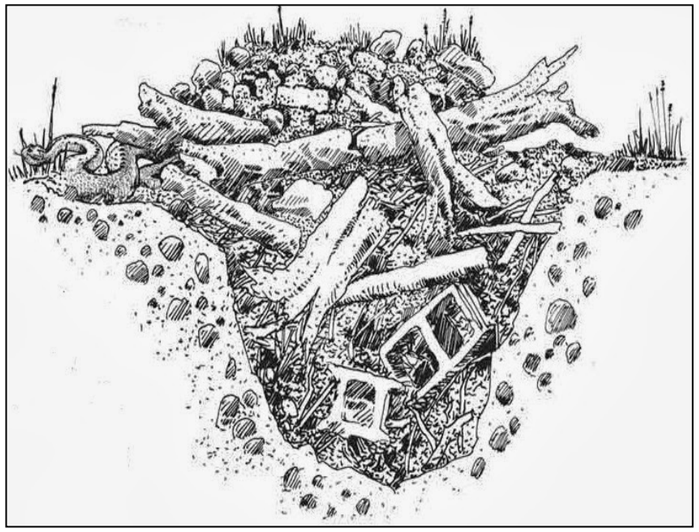
[18] **Ecology Practice 2015**. 166-04 Landscape & Ecology Plan: Outer Areas, Island Road, Reading.

construction, a standard reptile survey is carried out comprising 7 visits to check refugia set out across the receptor site.

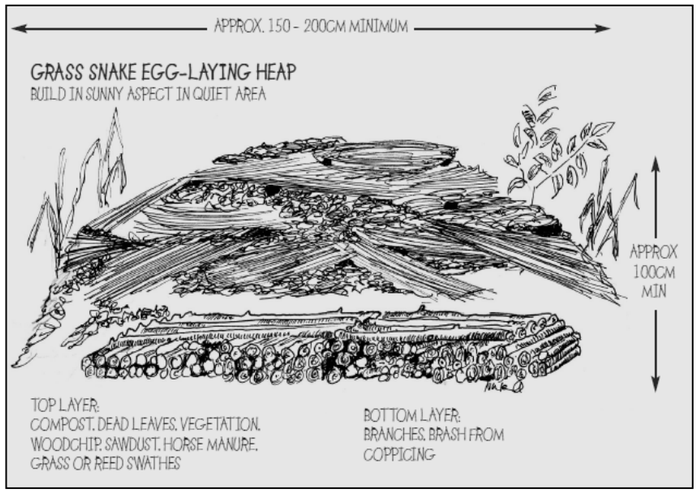
A report will be provided to the owner/occupier and to the local authority (both planning department and biological records facility) each year. In the 5th year, a population assessment should be carried out employing at least 20 visits to the site, and reported as above.



Grass snake hibernacula



Grass snake egg-laying heap



Reptile hibernacula

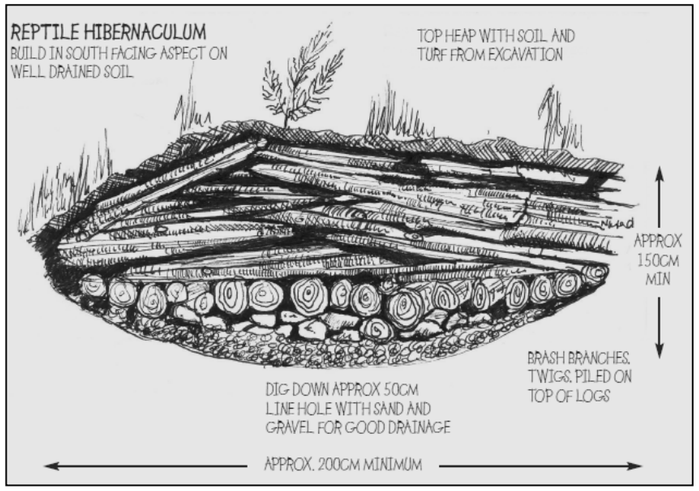


Figure 8: Reptile mitigation

Island Road, Reading

Legend

- Reptile proof barrier
- Reptile Receptor area
- Grass snake hibernacula
- Reptile hibernacula
- Grass snake egg-laying heap

Drawings are diagrammatic and not to scale. Refer to architect drawings for exact measurements

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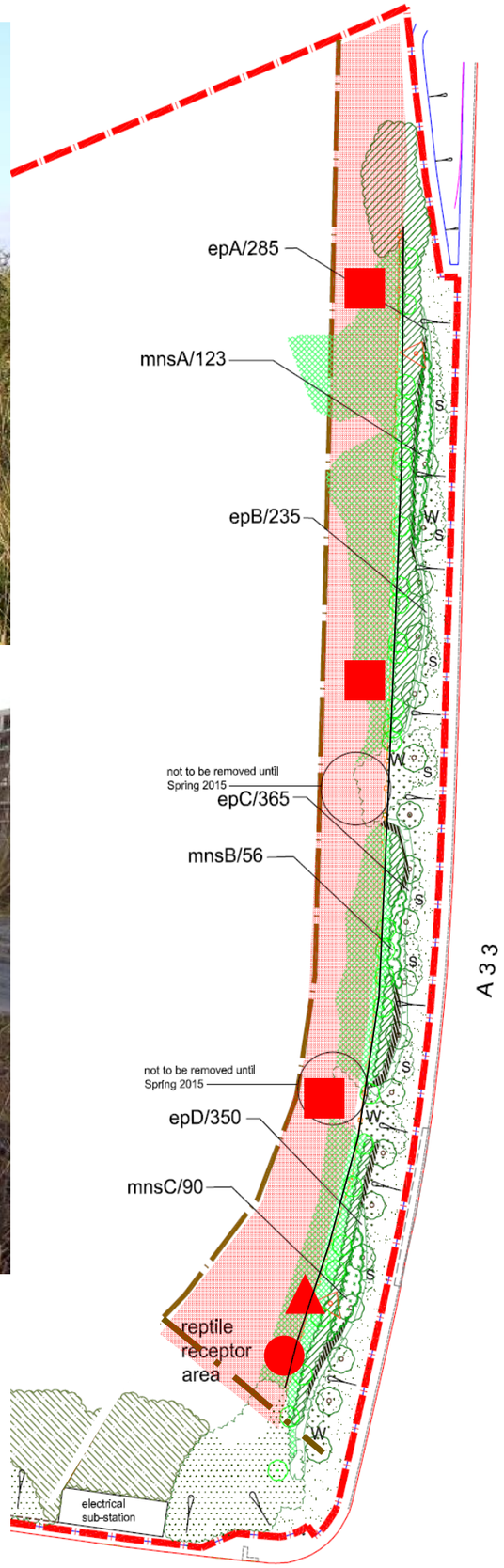
Figure 9: Reptile habitat enhancement 2014-2015

Island Road, Reading

Reptile area: August 2014 – Prior to enhancement works, view to north

Reptile area: Jan 2015 – After vegetation clearance, view to north



Reptile area: August 2015 – Before bramble clearance, view to south

Reptile area: September 2015 – After bramble clearance –view north

Reptile area: September 2015 – After bramble clearance, north-west bank.

Legend

- Reptile proof barrier
- Reptile Receptor area
- Mixed short grassland/scrub
- Grass snake hibernacula
- Reptile hibernacula
- Grass snake egg-laying heap

Drawings are diagrammatic and not to scale. Refer to architect drawings for exact measurements

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3.7. Population Monitoring

3.7.1. Grass snake and slow worm population monitoring will be completed within the first 5 years post construction and this will give a good indication of translocation success. Standard reptile survey comprising 7 visits to refugia set out across suitable habitat will be carried out for 4 years post-construction period.

3.7.2. A report will be provided to the owner/occupier and to the local authority (both planning department and biological records facility) each year. In the 5th year, a population assessment will be carried out employing at least 20 visits to the site, and reported as above.

3.7.3. The Ecology Practice are retained as project ecologists and will undertake all surveys over the five-year period. During this time the on-site habitats will also be monitored. This monitoring is over and above that to be completed by the assigned management and maintenance company for the site.

3.7.4. A Condition Assessment report will be filed for the Reptile receptor area, with the survey findings and will include discussion of any discrepancies between the management plan and the onsite conditions. Where discrepancies are identified the report will make reference to remedial actions and provide supplementary works schedules and prescriptions.

3.8. Reptile Mitigation & Enhancement Work schedule

Item	Description	2014	2015	2016	2017	2018	2019	2020
Pre-construction activities								
Hibernacula / refugia installation	Creation of refugia and hibernacula under ecologist supervision	August						
Habitat improvement	Early management of grassland and scrub under Ecologist supervision	August						
Fence installation	Installation of reptile barrier fence under ecologist supervision	September						
Translocation	Translocation by ecologist	Sept – Nov	August-October					
Construction activities								
Destructive search	Ecologist to supervise destructive searches of all remaining potential refuge areas and translocate any reptiles found			Spring				
Site checks	Reptile fence checks during construction to ensure it is unaffected by construction activities		Sept	Monthly				
Site habitat maintenance								
Annual mowing regime	Annual cut late to allow flowers to set seed, height not < 15cm.			August	August	August	August	August
Scrub management	Management of selected areas to prevent scrub encroachment.			February and September	February and September	February and September	February and September	February and September
Monitoring								
Presence	7 site visits to assess presence and approximate population numbers .			April-June & September	April-June & September	April-June & September	April-June & September	
Population count	20 site visits including mark recapture							April, May and September

Appendix I: Legislation

This report has been prepared in the following relevant statutory context.

Wildlife and Countryside Act 1981

The principle statutory instrument that governs nature conservation in England is the Wildlife and Countryside Act 1981 as amended (WCA 1981).

The WCA 1981 consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and the Birds Directive in Great Britain. It is complimented by the Wildlife and Countryside (Service of Notices) Act 1985, which relates to notices served under the 1981 Act, and the Conservation Regulations 1994 (as amended), which implement the Habitats Directive.

Containing four Parts and seventeen Schedules, the Act covers protection of wildlife (birds, and some animals and plants), the countryside, National Parks, and the designation of protected areas, and public rights of way.

Amendments to the Act have been made and there is a statutory quinquennial review of Schedules 5 and 8 (protected wild animals and plant respectively), undertaken by the country agencies and co-ordinated by the Joint Nature Conservation Committee. The 5th review was submitted in 2008, notably increasing water vole protection from partial to full.

Countryside and Rights of Way (CRoW) Act 2000

The CRoW Act 2000 places a duty on Government Departments and the National Assembly for Wales to have regard for the conservation of biodiversity and maintain lists of species and habitats for which conservation steps should be taken or promoted, in accordance with the 1992 Rio Convention on Biological Diversity. The Act makes various amendments to the WCA 1981 including increasing SSSI protection, management and policing.

DEFRA published the first 'list' in 2002 under Section 74 of the CRoW Act 2000, which was identical with the UK BAP list at the time, now superseded by the Natural Environment and Rural Communities Act 2006 Section 41 list (see below).

Natural Environment and Rural Communities (NERC) Act 2006

The NERC Act 2006 makes provision in respect of biodiversity, pesticides harmful to wildlife and the protection of birds, and in respect of invasive non-native species.

Section 40 of the Act lays a duty on authorities to have regard to the purpose of conserving biodiversity in compliance with the UN Biodiversity Convention in 1992. This is otherwise known as the 'Biodiversity Duty'. Guidance for local authorities on implementing the Biodiversity Duty is provided in DEFRA (2007)[19].

Section 41 List

For the purposes of conserving biodiversity, habitats and species of principle importance are listed through the provisions set out in Section 41 of this Act (replacing Section 74 of the CRoW Act 2000), referred to in this chapter as the Section 41 List. DEFRA 2007[19] references the UK and local Biodiversity Action Plans (BAPs) (see below) as the source of data for the Section 41 List. This chapter uses the List, as updated by the UK BAP, as a key guide for identification of ecological features to be affected by proposals, and to guide and weigh recommendations and mitigation.

The Section 41 List has been further refined by DEFRA 2007, where seven sectors have been selected where public bodies and other stakeholders can make a significant contribution to biodiversity conservation, through their Biodiversity Duty. Habitats and species relevant to each sector have been identified to help non-conservation professionals consider where the List might apply to them.

Of these seven, two are relevant to this assessment i.e. Land Use Planning and Regional & Local Government. The List was last updated in 2010 and referenced here as Natural England 2010[20].

[19] **DEFRA 2007** Guidance for local authorities on implementing the Biodiversity Duty. PB12584

[20] http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx

The Conservation of Habitats and Species Regulations 2010

These Regulations consolidate the Conservation (Natural Habitats, &c.) Regulations 1994, and together they transpose the European Habitats Directive[21] into domestic law. The Regulations provide for the designation and protection of 'European sites' (referred to in this assessment as Natura 2000 sites), the protection of 'European protected species', and the adaptation of planning and other controls for the protection of such.

Under the Regulations, UK competent authorities have a general duty to have regard to the EC Habitats and Birds[22] Directives.

Habitats (Habitats Regulations Assessment)

The Regulations require competent authorities to consider or review planning permission, applied for or granted, affecting a European site, and, subject to certain exceptions, restrict or revoke permission where the integrity of the site would be adversely affected. Under Regulation 61 of the Conservation of Habitats and Species Regulations 2010, where any proposed plan or project is likely to have an effect on a Natural 2000 site or qualifying feature for a site, then the competent authority (normally the local planning authority) will carry out an appropriate assessment of those effects, referred to as a Habitat Regulations Assessment (HRA).

Species

The Regulations make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4. However, these actions can be made lawful through the granting of licenses by the appropriate authorities. Licenses may be granted for a number of purposes (such as science and education, conservation, preserving public health and safety), but only after the appropriate authority, including the planning authority, is satisfied that there are no satisfactory alternatives and that such actions will have no detrimental effect on wild populations of the species concerned: these three elements form the basis of the three derogation 'tests' to be applied to satisfy European legislation.

[21] http://jncc.defra.gov.uk/page-1374
[22] http://jncc.defra.gov.uk/page-1373

ODPM Circular 06/2005 Biodiversity and Geological conservation

This Circular provides administrative guidance on the application of the law relating to planning and nature conservation as it applies in England. With the onset of the National Planning Policy Framework in March 2012 (see below), this remains as the principal source of statutory interpretation of the legislation listed above.

The Circular is presented in four Parts, of which the first three are relevant here. The Circular requires updating since the publication of the National Planning Policy Framework in March 2012 replaced Planning Policy Statements (see below), but should be applied as follows:

Part I: Internationally Designated Sites

i) This Part provides guidance on implementation of the Conservation of Species and Habitat Regulations 2010 (updating the Habitat Regulation 1994), in compliance with the Habitats Directive. The principal is maintenance of the Natura 2000 suite of sites. Helpful definition of derogation from the Habitats Directive and the 'three tests' is provided.

The principal of compensation is included, although this will be subject to strict testing under the 'three tests' system and is unlikely to be effective at an international level.

Part II: Nationally Designated Sites

ii) This Part focusses on Sites of Special Scientific Interest (SSSI) and provides guidance on interpretation of the Wildlife and Countryside Act 1981 (as amended, inc. the CROW Act 2000).

Part III: Conservation of habitats and species outside designated areas

iii) Part III pulls together statutory instruments and the route through which their protection is linked to Biodiversity Action Plans in the UK, both nationally and locally.

iv) Section 84 of this Circular states that the habitats and species listed in the S41 List are capable of being a material consideration.

v) Section 85 refers to the CRoW 2000 Act, Section 74, which has been superseded by the S41 List and requires updating. The importance of the S41 List in principal is set out here.

Section 95 identifies forthcoming DEFRA advice on Local Wildlife Sites. DEFRA 2006[23] subsequently defines local wildlife sites and their management, linking local wildlife sites to the

[23] **DEFRA 2006** Local Sites Guidance on their Identification, Selection and Management. PB11684

Conservation of Habitats and Species Regulations 2010 (Regulation 39[3]) where they are referred to as 'Stepping Stones'. This is a key link for local wildlife site protection via the Natural Environment White Paper[24], and Lawton 2010[25], and subsequently informing the England Biodiversity Strategy for 2020[26], all of which provide policy guidelines for protection of stepping stones integral to ecological networks, the latter as referred to most recently in the National Planning Policy Framework 2012 (see below).

[24] **DEFRA 2011(a)** The Natural Choice: securing the value of nature.

[25] **Lawton 2010** Making Space for Nature: a review of England's wildlife sites and ecological network. Chaired by Professor Sir John Lawton. Submitted to DEFRA 16th September 2010.

[26] **DEFRA 2011(b)** Biodiversity 2020: A strategy for England's wildlife and ecosystem services. PB13583

APPENDIX 2: TRANSLOCATION DATA

Table 5. 2014 Reptile translocation data

Date	Visit no.	Time @ Start	T°C @ start	Weather	Slow worm					Grass snake				
					Male	Female	Adult	Juvenile	**Total**	Male	Female	Adult	Juvenile	**Total**
21/09/2014	1	16:00	18	cloudy, windy					0					0
22/09/2014	2	14:00	17	partially sunny		1		1	2					0
23/09/2014	3	15:45	18	sunny		2			2					0
24/09/2014	4	12:00	14	sun & cloud			1	1	2					0
25/09/2014	5	10:00	12	sunny		3			3					0
26/09/2014	6	11:00	19	sun & cloud, humid	1	1			2					0
27/09/2014	7	12:15	18	sun & cloud			5	1	6					0
28/09/2014	8	10:30	18	sunny					0					0
29/09/2014	9	11:45	18	overcast	1	1			2					0
02/10/2014	10	13:30	21	sunny, humid					0					0
03/10/2014	11	10:30	18	cloud then sun, humid	1				1					0
06/10/2014	12	15:00	12	Light rain cloudy					0					0
07/10/2014	13	11:00	11.5	Sunny, bright, warm					0					0
08/10/2014	14	11:30	15.5	sunny, after rain					0					0
09/10/2014	15	15:45	13	Sunny, cloudy					0					0
10/10/2014	16	13:00	12	Sunny, light rain					0					0
11/10/2014	17	14:30	13	Cloudy, light sun					0					0
12/10/2014	18	14:30	14	Cloudy, sunny					0					0
13/10/2014	19	14:00	15	Cloudy					0					0
14/10/2014	20	15:00	12	Cloudy					0					0
22/10/2014	21	12:30	14	cloud/sun					0					0
23/10/2014	22	13:10	15	sunny					0					0
24/10/2014	23	14:45	17	Cloudy					0					0
25/10/2014	24	14:09	14	Cloudy/sunny					0					0
26/10/2014	25	10:20	13	Cloudy					0					0
28/10/2014	26	14:00	18.5	Sunny					0					0
29/10/2014	27	14:30	14	Raining					0					0
30/10/2014	28	13:30	18	Sunny					0					0
31/10/2014	29	11:45	19	Sunny					0					0
01/11/2014	30	11:30	16	Sunny					0					0
				TOTAL	**3**	**8**	**6**	**3**	**20**	0	0	0	0	0

Table 6. 2015 Reptile translocation and monitoring data

Date	Visit no.	Time @ Start	T°C @ start	Weather	Development site						Receptor area				
					Slow worm					Grass snake	Slow worm				
					Male	Female	Adult	Juvenile	**Total**	Juvenile	Male	Female	Adult	Juvenile	**Total**
19/08/2015	1	08:30	15	sun & cloud	1	2		2	**5**		3	5		8	**16**
25/08/2015	2	08:15	13	overcast		1		3	4			1		1	**2**
28/08/2015	3	08:15	13	sunny		1			1					1	**1**
01/09/2015	4	09:00	14	sun & cloud		2			**2**			6		4	**10**
04/09/2015	5	09:00	12	overcast/sun		1		5	**6**			6		8	**14**
07/09/2015	6	16:30	18	sunny		1			**1**	**1**					**0**
08/09/2015	7	11:40	14	sun & cloud		5		4	**9**			7		5	**12**
15/09/2015	8	10:00	15	sun/cloud/rain	1	2		5	**8**		1	4		3	**8**
23/09/2015	9	09:30	13	sun					**0**			2		2	**4**
02/10/2015	10	08:40	14	sun/cloud					**0**						
03/10/2015	11	09:00	13	sun/cloud	1				**1**						
04/10/2015	12	10:00	12	sun/cloud					**0**						
16/10/2015	13	10:00	13	sun/cloud					**0**						
17/10/2015	14	09:00	12	sun/cloud/rain					**0**						
18/10/2015	15	10:00	13	sun/cloud					**0**						
19/10/2015	16	10:00	12	overcast					**0**						
20/10/2015	17	09:00	15	sun/cloud					**0**						
				Total	**3**	**15**	**0**	**19**	**37**	**1**	4	31	0	32	**67**

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