A417 Missing Link
TR010056

6.4 Environmental Statement
Appendix 8.16 Reptile Survey Technical Report

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A417 Missing Link

Development Consent Order 202[x]

6.4 Environmental Statement
Appendix 8.16 Reptile Survey Technical Report

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Table of contents

Figures

Tables

Executive Summary

The proposed A417 Missing Link scheme aims to provide a dual carriageway to a current stretch of single carriageway between the Cowley roundabout and Crickley Hill. The scheme would increase capacity by creating a free-flowing link between the Brockworth Bypass and Cowley roundabout, resulting in a continuous flow between the M4 Junction 15 (Swindon) and the M5 Junction 11a (Gloucester/Cheltenham).

A habitat suitability assessment was completed identifying all suitable reptile habitat within100m of the scheme, which is the likely distance the scheme impacts are to extend for reptiles. From this desk assessment 50 sites were identified which required further investigation. Eighteen sites were subsequently identified as offering suitable habitat with potential to support common reptile species; these areas required further presence/absence surveys, which were undertaken between June and October 2018. At sites where presence of reptiles was confirmed, population estimate surveys were undertaken between March 2019 and September 2019.

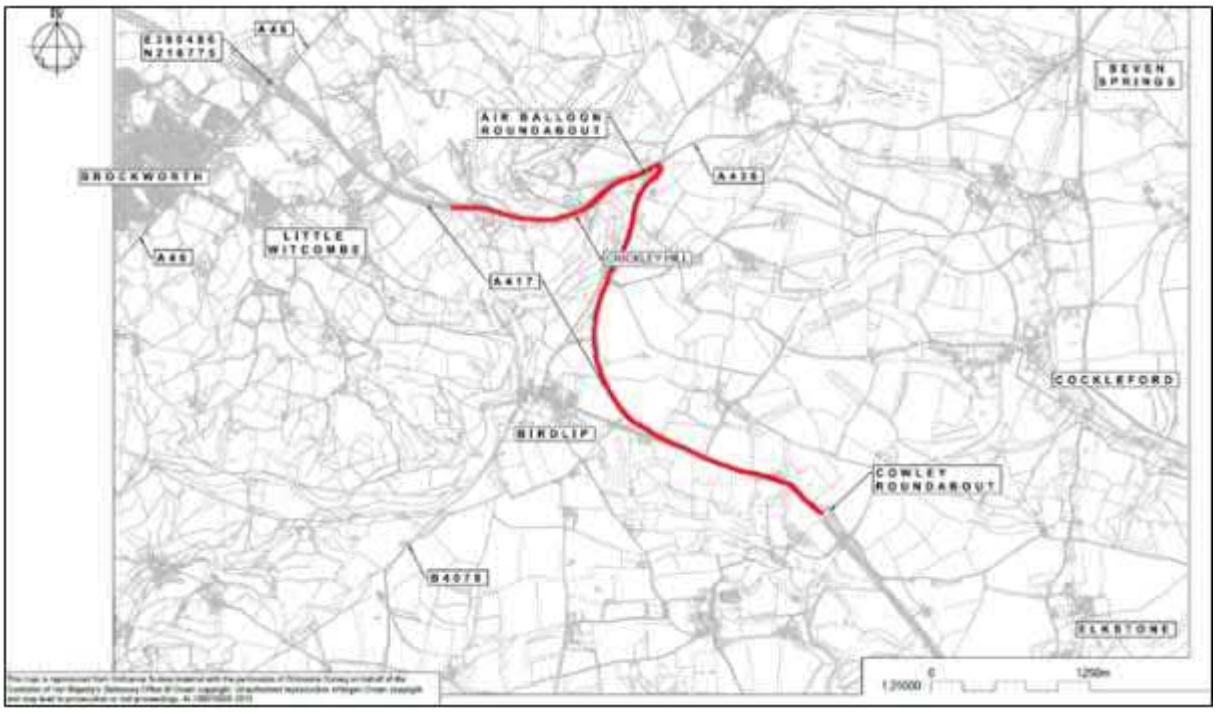
Surveys identified the presence of reptiles within 100m of the scheme at 17 of the 18 surveyed sites. Eleven of the 18 survey sites were identified as having good or exceptional reptile populations. All four species of common reptile were found on the scheme.

1. Introduction

1.1. Background

1.1.1. The A417/A419 provides an important link between the Midlands/North and South of England, between Gloucester and Swindon, and as an alternative to the M5/M4 route via Bristol. The section of the A417 near Birdlip, known as the 'missing link', forms the only section of single carriageway along the route, with an at-grade junction located at the 'Air Balloon' public house. The single carriageway is located between the Cowley roundabout and the base of Crickley Hill, a 5.5km stretch shown on Figure 1.1 below.

Figure 1.1 Current A417 route and scheme extent



1.2. Purpose of the Report

1.2.1. This Stage 2 reptile Technical Report has been prepared during Stage 2 of Highways England's Project Control Framework (PCF). This document presents the reptile Technical Report that has been prepared to date for the proposed A417 Missing Link scheme (hereafter referred to as 'the scheme'). The Technical Report provides an overview of the reptile survey results for the 2018 and 2019 survey period.

1.3. Overview of the Scheme

1.3.1. The proposed scheme would provide a dual carriageway to improve the current Missing Link section of single carriageway of the A417 between Cowley roundabout and Crickley Hill.

1.3.2. The proposed scheme would aim to increase capacity by creating a free-flowing link between the Brockworth Bypass and the Cowley roundabout and remove the at-grade junction with the A436 (Air Balloon roundabout). This Missing Link will provide a free-flowing journey between Swindon (M4 Junction 15) and Gloucester / Cheltenham (M5 Junction 11a). The current road and the extent of any proposed scheme is are illustrated in Figure 1.1.

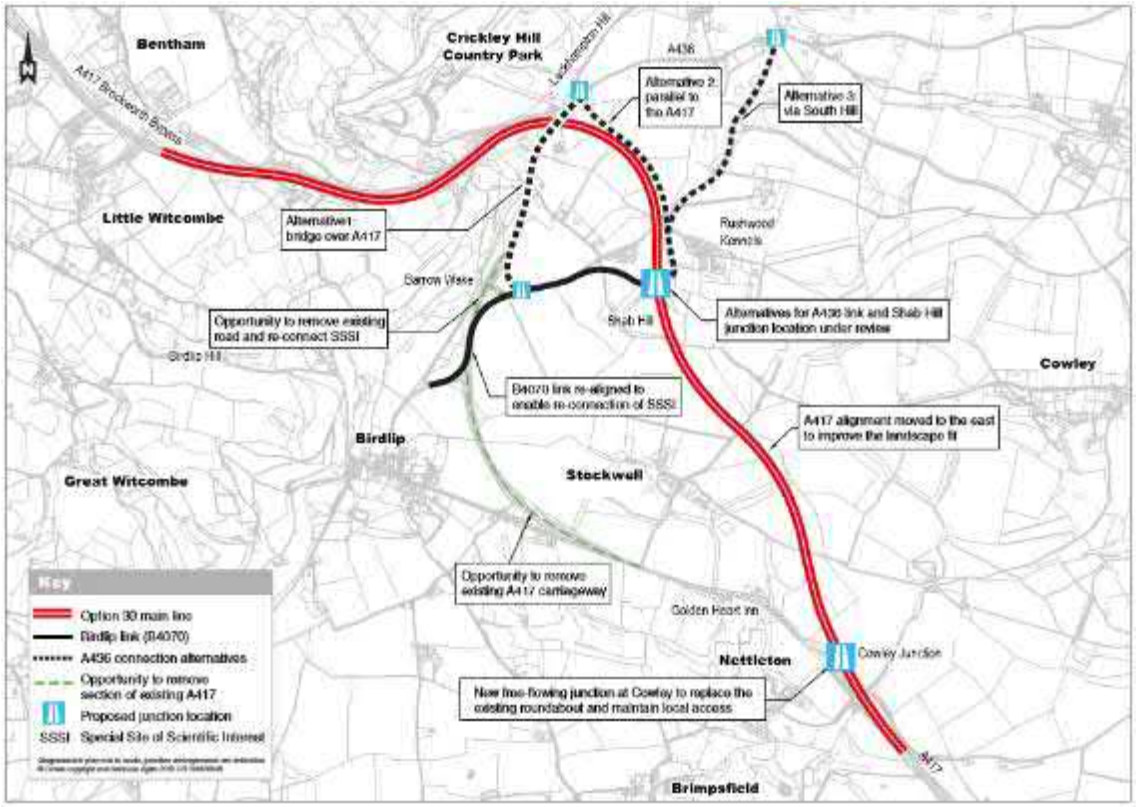
Option 30

1.3.3. Option 30 is the chosen preferred route option as of May 2019. Option 30 is a 5.6km long surface route following the route of existing A417 at Crickley Hill, but with less of a slope. A new section of road would be built through Shab Hill to the east of the existing A417, re-joining the existing road near Cowley roundabout, shown in figure 1.2 below. There would be 3 lanes of carriageway going up Crickley Hill and 2 lanes coming down, with 2 lanes in both directions after the hill. Option 30 would include 2 new slip road junctions:

- A slip road junction at Shab Hill for local and A436 traffic to join or leave the A417 by way of a new link road.
- A slip road junction to replace the existing Cowley roundabout for traffic to Nettleton Bottom, Cowley, Elkstone and other local destinations.

1.3.4. A new link road would be built between the slip road junction at Shab Hill and the existing A417 to connect traffic to and from Birdlip and the A436 with the new A417. This new link road would end in a new roundabout near Barrow Wake.

Figure 1.2: A417 Missing link proposed option 30



1.4. Scope of the Report

1.4.1. The objectives of this report are:

- to present the methodology, constraints and results of the presence/absence and population estimate surveys
- to present the relative abundance of the common reptile populations, if any

1.4.2. Guidance on ecological assessments recommends that all ecological features that occur within a zone of influence (ZoI) for a proposed scheme are investigated (CIEEM, 2016)[1]. All areas within 100m of the proposed scheme footprint were assessed for reptile habitat suitability.

1.5. Legislation

Legal Protection

1.5.1. Due to the geographical location of the scheme, only 4 widespread species of reptile could potentially be encountered. Rare species such as the smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis* have restricted ranges, so

[1] Chartered Institute of Ecology and Environmental Management (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal

their distribution and habitat preferences are not represented within the study area. Therefore, rare species are not considered any further as part of this assessment.

1.5.2. The 4 widespread species of reptile that could be present comprise the common lizard *Zootoca vivipara*, slow worm *Anguis fragilis*, grass snake *Natrix natrix* and adder *Vipera berus*. They are protected under Schedule 5 (Sections 9.1, 9.5a, 9.5b) of the Wildlife and Countryside Act 1981 (as amended), it is illegal to:

- Intentionally or deliberately kill, injure or take any reptiles
- possess or advertise / sell / exchange a reptile (dead or alive) or any part of a reptile

1.6. Status of Reptiles at a National Level

1.6.1. Four common reptiles and two rare reptiles species are native to the UK. Slow worms and common lizards are widespread and likely to occur nationally, but adders and grass snakes are less widespread, largely due to habitat loss. Adders have decreased in range and numbers considerably over the past 50 years and are noted as a priority Species under the UK Post-2010 Biodiversity Framework.

1.7. Status of reptiles at county Level

1.7.1. Gloucestershire Council places a large emphasis on reptile conservation. There are large areas within the county of suitable habitat which may house extensive populations of all 4 common reptile species.

1.7.2. Gloucestershire Centre for Environmental Records (GCER) lists all reptile species as being recorded in the county, refer to Appendix A. In addition, the slow worm is listed in the local Biodiversity Action Plan (BAP) for South Gloucestershire as a local priority species.

1.8. Reptile ecology

Grass Snake

1.8.1. Due to a diet consisting largely of frogs, toads and newts, the grass snake generally utilises fresh water habitats near to areas of open grassland.

1.8.2. Grass snake hibernacula generally comprise of disused rabbit holes within well drained slopes.

1.8.3. They can be observed basking near to hibernacula during the springtime in the evening and early morning.

1.8.4. Grass snakes lay shelled eggs, usually within compost heaps or similar areas providing warmth to aid incubation.

Common Lizard

1.8.5. The common lizard favours habitat which has a complex structure, for example mature grassland with scattered scrub, stone walls and heathland.

1.8.6. Mating takes place in spring and females give birth to live young in August.

1.8.7. The common lizard prefers open sunny locations for basking and is usually found in dry, exposed locations where dense cover exists close by.

1.8.8. Common lizards feed predominantly on spiders and insects.

Slow Worm

1.8.9. Slow worms are often found in low intensity managed grassland, sheltering and foraging within grass that has developed into a thatch like structure.

1.8.10. Slow worms are often found in disused hay meadows, landfill sites, gardens, allotments, highway verges and brownfield sites and are widespread throughout the UK.

1.8.11. Slow worms feed on slow-moving soft bodied prey items, particularly small slugs.

Adder

1.8.12. The adder is found throughout Britain, occurring most commonly in open habitats such as heathland, moorland, open woodland and sea cliffs, and rarely stray into gardens.

1.8.13. Mating takes place in April to May and female adders incubate their eggs internally and give birth to live young in August or September.

1.8.14. Adders feed largely on small rodents and lizards. They are creatures of habit, returning to the same hibernacula annually.

1.8.15. They are a Priority Species under the UK Post-2010 Biodiversity Framework.

2. Methodology

2.1. Desk Study

2.1.1. Biological records within a 2km radius of the proposed scheme were acquired from the Gloucestershire Centre for Environmental Records (GCER) in February 2017. The results of this data search are summarised in Appendix A. This included protected species, notable habitats and statutory and non-statutory designated sites.

2.1.2. In addition to the GECR data search, data was also obtained in 2018 from the National Trust and Gloucestershire Wildlife Trust, which indicated the presence of priority species adder at Crickley Hill Country Park. James Weston from South Gloucestershire amphibian and reptile group (SGARG) is undertaking monitoring of the Crickley Hill site for adders and has kindly provided his survey results. These study areas were not monitored by Mott MacDonald to avoid disturbance and population overestimates. The SGARG data is included in Chapter 3.

2.1.3. All potentially suitable habitats directly impacted by the scheme were identified using the MAGIC online viewer tool (Defra, 2017) and the use of 1:10,000 Ordnance Survey Mapping and aerial photography. These were recorded and given a unique identifier. At the time of the desk study and subsequent surveys in 2018, there were two options under consideration. The desk study therefore identified all potentially suitable habitat directly affected these two options. Since the announcement of the preferred route in March 2019 only sites affected by route option 30 were surveyed further during the 2019 survey season.

2.2. Habitat Assessment

2.2.1. An extended Phase 1 Habitat Survey was undertaken in May and June 2017 by two experienced Mott MacDonald Ecologists. Suitable habitat within a 100m radius of the scheme was identified and assessed further to determine whether these areas had the appropriate habitat structure to support reptile populations. This was based on the following characteristics:

- Location in relation to species range
- Vegetation structure
- Insolation (exposure to sun)
- Aspect
- Connectivity to other good quality habitat
- Prey abundance
- Refuge opportunities
- Hibernation habitat potential

- Disturbance
- Egg-laying site potential (for Grass Snake only)

2.2.2. The habitat assessment graded each habitat as having either “low”, “medium” or “high” potential to support reptiles, based on the criteria above.

2.3. Field Survey

2.3.1. At sites identified as providing potential reptile habitat, survey sites were set up. A mix of corrugated tin, onduline and roofing felt tiles measuring 0.5 metres by 0.5 metres were deployed at each site with the potential to support reptiles, in areas of suitable habitat. The tiles act as artificial refugia; attractive to reptiles as basking locations as they heat up quicker than the surrounding environment, as well as providing cover.

2.3.2. In linear habitats, such as road verges and field margins, refugia were placed approximately every 10 metres. Conversely, in non-linear habitats (entire fields and woodland), a density of around 10 tiles per hectare was deployed. Each tile was numbered with spray paint and a GPS location recorded.

2.3.3. After a settling-in period of at least 7 days, surveys on each habitat area were undertaken to check for reptiles. As well as checking the artificial refugia, surveyors checked any suitable natural refugia (e.g. logs, stones) and conducted a visual search between refugia. Details including refugia number, species, life stage (adult, sub-adult, juvenile) and sex (when possible) were recorded on a survey proforma, along with weather, time and date. Each visit was conducted during the following conditions:

- Time: conducted between 07:00 and 19:00
- Air temperature: 10°c - 20°c
- Wind: still to moderate (equivalent to Beaufort 4; 13 - 17mph)
- Rain: no or light rain only at time of survey. Surveys between periods of heavy rain (when all other conditions are suitable) are also acceptable.

2.3.4. Sites were initially subjected to seven visits to determine presence or likely absence. Following these initial surveys, the number of surveys was extended to twenty visits to provide a more accurate estimate of population sizes on the sites where presence had been confirmed. Surveys were undertaken in suitable weather conditions, between June and October 2018 and March to September 2019, to determine presence or likely absence of reptiles. No reptiles were identified at site 48 during the initial 7 survey visits. However, surveys were continued at this site for a total to 16 survey visits due to its proximity to site 45 and its connectivity to Crickley Hill. However, following 16 visits with no reptiles recorded, surveys were stopped at this site. All other sites that were surveyed for

Option 30 recorded positive results and were subject to population estimate surveys.

2.3.5. Due to the presence of the priority species; adder, during the 2019 survey season, specific adder sites were set up in suitable locations alongside existing reptile sites. Adder survey sites were targeted in areas which provided high quality habitat such as areas of rough grassland and scrub with suitable hibernacula features such as bunds or hedge banks. Surveys at adder sites were commenced in March 2019 to capture the early part of the season when adders emerge from hibernacula.

2.3.6. Population size and importance of reptile population is assessed according to categories described under Froglife Advice Sheet 10: Reptile Survey. These identify site importance for reptiles according to the maximum number of adult animals recorded by a single surveyor on a single day during observation and refuge checks, where artificial refugia are at a density of 10 per hectare[2].

2.3.7. The site monitored by SGARG was an exception to this. The survey results are derived from a pre-existing reptile monitoring site with a density of refugia lower than 10 per hectare. The tile density is unknown; therefore a calculation has been made based on an estimate of 10 tiles per hectare.

2.3.8. Each population category present is awarded a score, these are totalled to estimate site importance. Categories summarised in Table 1.

Table 1: Reptile Population Score Categories

Species	Low population (Score 1)	Good population (Score 2)	Exceptional population (Score 3)
Slow worm	< 5	5-20	>20
Common lizard	< 5	5-20	>20
Adder	< 5	5-10	>10
Grass snake	< 5	5-10	>10

Source: Froglife Advice Sheet 103

2.3.9. Each population present is also awarded a population density score. This is calculated using the 'maximum number recorded over single visit' (also known as the peak count) divided by the area of the habitat available. The population density scores are given in Table 2 below. Values related to the number of individuals per hectare.

[2] Froglife 2015, Surveying for Reptiles: Tips, techniques and skills to help you survey for reptiles. https://www.froglife.org/wp-content/uploads/2013/06/Reptile-survey-booklet-3mm-bleed.pdf
[3] Froglife 1999, Reptile Survey: An introduction to planning, conducting and interpreting surveys for snake and lizards conservation https://www.wildcare.co.uk/media/wysiwyg/pdfs/froglife_advice_sheet_10_-_reptile_surveys.pdf

Table 2: Reptile Population Density Categories

Species	Low	Medium	High
Slow Worm	<50 / hectare	50 – 100 / hectare	>100 / hectare
Common Lizard	<20 / hectare	20 – 80 / hectare	>80 / hectare
Adder	<2 / hectare	2 – 4 / hectare	>4 / hectare
Grass Snake	<2 / hectare	2 – 4 / hectare	>4 / hectare

Source: Adapted from Herpetofauna Groups of Great Britain and Ireland[4].

2.3.10. As a general rule, sites are automatically classed as of importance to reptile species if they:

- support 3 or more reptile species
- support 2 snake species
- support an exceptional population of 1 species
- support an assemblage of species scoring at least 4 (according to a total of score obtained from Table 1 above)
- are of significant regional importance due to local rarity

2.4. Site Status Assessment

2.4.1. Following the completion of the surveys an assessment of the status of the site was then made. The importance of the site takes into account the population estimate but also several other factors:

- The quality and rarity of the habitat and population,
- How connected the population is to the wider area,
- The local significance of the population and
- The estimated size of the population.

2.5. Survey Constraints

2.5.1. Where reptiles have not been identified as occupying an area, this does not guarantee their absence. There is always the risk of reptiles being over-looked due to use of the artificial refugia and abundance of natural habitat. Along with potentially low populations, some may go undetected.

[4] Herpetofauna Groups of Great Britain and Ireland (1998) Evaluating local mitigation/translocation programmes: Maintaining best practice and lawful standards. https://www.arguk.org/downloads-in-pages/resources/scientific-and-technical-reports/4-evaluating-local-mitigation-translocation-best-practice-and-lawful-standards/file

2.5.2. Access was granted for nearly all sites with suitable reptile habitat. Table 3 below shows the 18 sites that had 20 surveys completed across two survey seasons.

2.5.3. Access to site 39 was restricted at certain times throughout the season and was also only permitted on Tuesdays. These access restrictions meant that in order to achieve the full 20 survey visits, two surveys were undertaken on the same day on a number of occasions. Where 2 surveys were undertaken, these were done in the morning and late afternoon, depending on suitable weather conditions.

2.5.4. Access for some reptile sites was not granted until later in the 2018 survey window and some sites were not set up until the beginning of the 2019 survey period. Specific adder sites were set up due to the regional importance of the species.

2.5.5. The suitability of areas of areas changed throughout the years with various sites being cut, grazed and vulnerable to public interference.

Table 3 Reptile site summary and set up date

Reptile Site	Adder Site	Reptile set up 2018	Reptile set up 2019	Adder site up date 2019
2	A5	August 2018	April 2019	March 2019
3	-	-	May 2019	-
6	A1	-	April 2019	March 2019
8	-	June 2018	May 2019	-
10	-	May 2018	-	-
18	A18	-	April 2019	April 2019
21	-	May 2018	April 2019	-
25	A10	-	April 2019	April 2019
39	-	-	April 2019	-
41	-	June 2018	April 2019	-
43	A43	August 2018	April 2019	April 2019
44	A8	August 2018	April 2019	March 2019
45	-	August 2018	April 2019	-
46	A6	August 2018	April 2019	March 2019
47	A9	August 2018	March 2019	March 2019
48	A4	August 2018	March 2019	March 2019
49	A7		March 2019	March 2019
ARG		South Gloucestershire Amphibian and Reptile Group monitoring site. No monitoring from Mott MacDonald to avoid disturbance and remove duplicate results.		

2.5.6. A small number of felts we destroyed by livestock or by habitat management e.g. grass cutting. However, these were replaced as soon as where necessary (Site 2). A small number were also disturbed and moved by members of the public who believed they were litter (Site 41, 45 and 48).

2.5.7. Where sites were made unsuitable during the course of the seasons due to various reasons these surveys were stopped, and felts collected.

2.5.8. A number of surveys were undertaken in July 2019, outside of the optimal survey season. Surveys in July are not normally undertaken as the typical higher temperatures mean that reptiles do not need to visit survey tiles to warm up. Surveys were undertaken in July due to a period of poor weather in June delaying surveys, as well as certain site access restrictions meaning that to undertake 20 survey visits, surveys had to continue in July. However, this is not considered to be a significant constraint as surveys on all sites extended over a wide part of the survey season, and were not restricted to sub-optimal months. Surveys were only undertaken during suitable temperatures and the July surveys provided some valuable results, including recordings of adder on sites where none had been recorded during the spring surveys. Overall, the surveys are considered to provide a robust assessment of the distribution and abundance of reptiles along the corridor of the proposed scheme.

2.5.9. Reptile site 3 was only subject to 17 surveys (out of 20 surveys to establish population size). However, it is considered that sufficient survey data has been collected at this site to enable a robust conclusion on the likely impact on reptiles to be assessed and for an appropriate mitigation strategy to be developed.

2.5.10. Access was not possible during the 2018 or 2019 surveys to a number of land parcels, including GR298558, GR258761 and GR306305. Observations from neighbouring land parcels indicates that suitable reptile habitat is likely to be present within these land parcels and further investigation should be undertaken once access is granted.

3. Results

3.1. Desk Study Results

3.1.1. The data search results from GCER revealed records of all four-reptile species up to a 2km radius of the scheme. Refer to Appendix A. Adder, slow worm and common lizard were all found at Crickley Hill Country Park and Barrow Wake SSSI (Site Special Scientific Interest). Both of these sites are within 200m of the scheme. The closest grass snake record was in Bentham 160m away from the scheme in 2008.

3.2. Habitat Assessment

3.2.1. All habitat within 100m of the scheme was assessed for its suitability to support reptiles. Fifty sites were originally identified during the desk study as requiring further assessment. During the initial site visits in May 2018 18 of the 50 sites were identified as offering suitable habitat to support common reptile populations. Of the 18 sites 17 were subject to further presence/absence surveys carried out between June and October 2018 and March to June 2019 by Mott MacDonald. 1 site monitoring was undertaken by SGARG.

3.2.2. Sixteen surveys were undertaken at Site 48 with no record of reptiles and therefore reptiles are likely absent from this site.

3.2.3. The remaining 17 sites are described in more detail in the sections below. A site map which shows the locations of the 17 surveyed sites and the discontinued site 48 is presented in Appendix B. Appendix C displays sites specifically set up for adders, this often overlap with reptile monitoring sites.

3.3. Description of Habitats

Site 2 (Adder 5)

3.3.1. Site 2 lies at the southern end of the scheme, south of the Cowley roundabout on the east side of the A417, partly using the underpass. The habitat consists of a long grass and wildflower verge, approximately 3-4 metres wide, which includes cock's foot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus,* creeping buttercup *Ranunculus repens* and vetch *Vicia* species. Patches of thicker vegetation and scrub surrounds the underpass and extends north, with a drystone wall separating the verge from arable fields. High prey availability and plentiful refuge opportunities provide good cover and foraging opportunities for reptiles. Overall this constitutes a medium quality reptile habitat.

3.3.2. Figure 3.1 shows the habitat at site 2.

Figure 3.1 Site 2 habitat example

Site 3

3.3.3. Site 3 is a road verge leading from the Cowley roundabout south towards the A417 underpass. The habitat consists of a long grass, bramble, shurbs and wildflowers, approximately 6-7 metres wide, which includes cock's foot, Yorkshire fog, creeping buttercup and vetch species. Patches of thicker vegetation and scrub appear as you get closer to the underpass and extends along to reptile site 2. High prey availability and plentiful refuge opportunities provide good cover and foraging opportunities for reptiles. This area is regularly mown, at time of survey some long dense grass and partly mown sections are present. A small wooded area borders this site and is connected to grazed farmland. Overall this constitutes a medium quality reptile habitat.

3.3.4. Figure 3.2 below provides an example of the habitat present at site 3.

Figure 3.2 Site 3 habitat example

Site 6 (Adder 1)

3.3.5. Site 6 is located on the east side of the current A417, in the disused Birdlip quarry site, recently used as bike track. This site is a mixture of bare ground, long semi-improved grassland and shrub, connected to site 8, 150m north. A

large number of bare earth tracks through areas of diverse plant species. A large number of natural refugia and basking areas. The site is connected to surrounding farmland with a diverse sward structure. Various scrub patches and a beech *Fagus sylvatica* woodland to south. Species present include selfheal *Prunella*, wild thyme *Thymus serpyllum,* pyramidal orchid *Anacamptis pyramidalis,* common spotted orchid *Dactylorhiza fuchsii,* bee orchid *Ophrys apifera,* willowherb *Epilobium* sp rosebay willowherb *Chamaenerion angustifolium*, white clover *Trifolium repens*, false oat grass *Arrhenatherum elatius*, oxeye daisy *Leucanthemum vulgare* and fox and cubs *Pilosella aurantiaca*. Overall this constitutes a high-quality reptile habitat.

3.3.6. Figure 3.3 below demonstrates an example of the habitat present.

Figure 3.3 Site 6 habitat example

Site 8

3.3.7. Site 8 is located in Stockwell Farm and is situated between grazing fields and is a wide margin approximately 24metres wide, with a larger woodland area to the south. This woodland is continuous with the nettle and bramble-dominated ruderal habitat. A mixture of tall sward and short, dead grass creates a complex vegetation structure. Providing good basking habitat, but mowing regimes may mean reptiles move in and out periodically. Overall this constitutes a medium quality reptile habitat.

3.3.8. Figure 3.4 below demonstrates an example of the habitat present.

Figure 3.4 Site 8 habitat example

Site 10

3.3.9. Site 10 is a wide field margin at Stockwell Farm; close to livestock fields and hard standing areas. The site possesses a complex mosaic structure of different grassland, including good foraging, basking and hibernating potential; log piles, large rocks and other debris litter the hardstanding edges. Combined with a south facing slope and compost heaps 50m to the west across a small farm track also offer good egg-laying habitat for Grass Snakes. High prey availability and excellent connectivity, however overall size and relative isolation makes this area a medium- quality habitat for reptiles.

3.3.10. Figure 3.5 below demonstrates an example of the habitat present.

Figure 3.5 Site 10 habitat example

Site 18 (Adder 18)

3.3.11. Site 18 is a long south facing strip of field margin between two arable fields, comprising improved and rough grassland approximately 5-6metres wide, with variable sward structure including small amounts of scrub creating refuge opportunities. There are various patches of tussock and denser grassland with a more complex species diversity, including; vetch sp *Vicia*, cocks foot *Dactylis*

glomerata, red clover *Trifolium pratense*, birds foot trefoil *Lotus corniculatus*, yorkshire fog *Holcus lanatus*, meadow buttercup *Ranunculus acris* and oxeye daisy *Leucanthemum vulgare*. Egg-laying habitat for grass snakes is limited, but the longer denser patches of grassland connectivity to the wider habitat means that there is high potential for reptiles. Overall this constitutes a high-quality reptile habitat.

3.3.12. Figure 3.6 below demonstrates an example of the habitat present.

Figure 3.6 Site 18 habitat example

Site 21

3.3.13. Site 21 is located within the habitat to the immediate east of the Barrow Wake underpass. The quiet road is bordered by two moderately steep banks covered in a mosaic of short perennial and tall ruderal species which receive plenty of sun. The small shrubs and trees at the top of the bank provide good cover and foraging opportunities; they border the surrounding grazing and pasture fields. Connectivity is limited to a small corridor to the north, along the A417 verge. Overall this constitutes a medium quality reptile habitat.

3.3.14. Figure 3.7 below demonstrates an example of the habitat present.

Figure 3.7 Site 21 habitat example

Site 25 (Adder 10)

3.3.15. Site 25 is split into two sections across a small access track. The north sits in a 2.21ha semi improved grassland field with an arable field margin, with long tufted grass, unmanaged, ungrazed and variable sward structure with longer and shorter sections of grass. The southern section is located in a 5.5ha area of rough grassland. The small shrubs and trees along the access track road provide good cover and foraging opportunities, with a dry-stone wall running along the track. Species include: cock's foot *Dactylis glomerata*, woolly thistle *Cirsium eriophorum*, bird's foot trefoil *Lotus corniculatus*, mouseear *Cerastium*, Yorkshire fog *Holcus lanatus* and white clover *Trifolium repens*. The dense grassland and thatch give this area high-quality reptile habitat.

3.3.16. Figure 3.8 below demonstrates an example of the habitat present.

Figure 3.8 Site 35 habitat example

Site 39

3.3.17. Site 39 is a slightly smaller site, 0.26 hectares of improved abandoned grassland with areas of dense nettle *Urtica dioica* and bramble and is located between two patches of dense scrub, notably hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa*, interspersed with elder *Sambucus nigra*, hazel *Corylus avellane* and field maple *Acer campestre.* Surrounding this is an area of mature broadleaved woodland comprising beech, oak and sycamore. The A417 is directly north of the scrub and southern border comprised of a small stream. Overall this constitutes a medium quality reptile habitat.

3.3.18. Figure 3.9 below demonstrates an example of the habitat present.

Figure 3.9 Site 39 example habitat

Site 41

3.3.19. Site 41 is primarily a road verge, dominated by grass habitats with varying sward heights. Thin lines of scrub shield the verge from the A417 on the opposite side. A hay meadow exists at the northern end of the site, which is exposed to sun throughout the day. The verge itself is only subject to infrequent cutting, decreasing disturbance. The denser grassy areas provide suitable egg-laying habitat for grass snake, and dead wood in the adjacent woodland provides potential hibernacula. Connectivity is good to the south; the site is continuous with the A417 verge and a woodland corridor. There is woodland to the north, beyond the hay meadow, which also provides high quality foraging and hibernating opportunities. Overall this constitutes a medium quality reptile habitat.

3.3.20. Figure 3.10 below demonstrates an example of the habitat present.

Figure 3.10 Site 41 habitat example

Site 43 (Adder 43)

3.3.21. The area is a small valley, with improved grassland comprising much of the centre; species include cock's foot *Dactylis glomerata*, false oat grass *Arrhenatherum elatius* and nettles. The western portion of the site contains a tussock border and denser vegetation with a more complex structure and species diversity. Hawthorn and bramble pockets to the north, and beech woodland to the west both offer cover and hibernation opportunities. Egg-laying habitat is limited, but a ditch line and potential for amphibians means that there is potential for grass snake presence. Wider habitat connectivity is good; rough grassland to the west, pasture to the southeast and ash woodland to the north. The north-west corner of the field has the greatest reptile potential due to the carrying sward height, ant hills and higher plant species richness, therefore offering plenty of basking opportunities. Overall this constitutes a high-quality reptile habitat.

3.3.22. Figure 3.11 below demonstrates an example of the habitat present.

Figure 3.11 Site 43 habitat example

Site 44 and Adder 8

3.3.23. Site 44 is located on the west side of the A417, approximately 400m south of the 'Air Balloon' roundabout. The mixed woodland adjacent to the carriageway offers good foraging and hibernation potential. The site then opens out into a meadow with varying sward height. Patches of dense vegetation and ruderal habitat alongside more open areas create the complex structure preferable for basking and foraging. The woodland and scrub at the edges of the field provide good cover. Figure 3.12 shows the different habitats within the site. Overall this constitutes a high-quality reptile habitat.

3.3.24. Figure 3.12 below demonstrates an example of the habitat present.

Figure 3.12 Site 44 habitat example

Site 45

3.3.25. Located within the south - eastern most section of Crickley Hill Country Park situated on a moderate incline, connected to the rest of the habitats within the park; woodland, scrub and open meadows. The variety in sward height and denser ruderal areas provides a complex grass structure and facilitates high insect prey diversity. The presence of deadwood and drystone walls offers additional cover and hibernating opportunities along with the woodland itself. Overall this constitutes a high-quality reptile habitat.

3.3.26. Figure 3.13 below demonstrates an example of the habitat present.

Figure 3.13 Site 45 habitat example

Site 46 (Adder 6)

3.3.27. Site 46 is an area of semi-improved grassland at the back of the Air Balloon public house which has been left unmanaged for a number of years. The field is separated from the car park by a line of scattered shrubs. The majority of the area is comprised of long grass and ruderal species, creating a variety of sward heights and grass structure. There are drystone walls partially bordering the east

and west sides of the field, and a line of conifers to the south. This habitat provides good foraging, basking and cover opportunities for reptiles and is connected to site 47 below via adjacent grassland. Overall this constitutes a medium quality reptile habitat.

3.3.28. Figure 3.14 below demonstrates an example of the habitat present.

Figure 3.14 Site 46 habitat example

Site 47 (Adder 9)

3.3.29. Site 47 is on the west side of the A417, approximately 250m south of the 'Air Balloon' roundabout. The site is a field comprising a variety of different grasses of mixed height; this supports a high prey availability. The field is adjacent to deciduous woodland and well connected to neighbouring grassland habitats and site 46. The south-facing slope receives sun exposure for most of the day, offering good basking opportunities. Refuge and hibernation opportunities are also rife, with drystone walls, tussocks, disused mammal burrows and ant hills all present. Overall, this constitutes a high-quality reptile habitat.

3.3.30. Figure 3.15 below demonstrates an example of the habitat present.

Figure 3.15 Site 47 habitat example

Site 48

3.3.31. Site 48 is located along the eastern edge of Crickley Hill Country Park on either side of the access road to the Crickley Hill car park. The site is a field comprising grazed semi-improved grassland. The site is connected to good quality reptile habitat within the Crickley Hill Country Park to the west, which includes locally frequent large ant hills, indicating a lack of intensive management. Areas of dense scrub and deadwood habitat provide good hibernation opportunities within the adjacent habitat, and a drystone wall to the east provides further refuge and potential hibernation habitat. The grassland is subject to cattle grazing and also regular disturbance by dogwalkers. Overall, this constitutes poor-quality reptile habitat, but is adjacent to areas of higher quality habitat.

3.3.32. Figure 3.16 below demonstrates an example of the habitat present.

Figure 3.16 Site 48 habitat example

Site 49 (Adder 7)

3.3.33. Site 49 is to the east of the proposed new A417 and is a 450m vegetated north facing bund. The site is a field comprising a variety of different grasses of mixed height, scrub and immature woodland species such as hawthorn and buckthorn; this supports a high prey availability. This is adjacent to agricultural fields and low use improved grassland fields. The north-facing slope receives sun exposure as it is not overly steep, offering good basking opportunities. Refuge and hibernation opportunities are also abundant, with a crumbling drystone wall, tussocks, disused mammal burrows and anthills all present. Overall, this constitutes a medium-quality reptile habitat.

3.3.34. Figure 3.17 below demonstrates an example of the habitat present.

Figure 3.17 Site 49 habitat example

Site ARG

3.3.35. Site ARG is located within the Crickley Hill Country Park SSSI. The site is a SSSI comprising a variety of different grasses of mixed height, scrub and immature trees, supporting a high prey availability. There are areas of unimproved calcareous grassland and a south-facing slope, which is very steep, offering good basking opportunities. Refuge and hibernation opportunities are also abundant, with a crumbling drystone wall, tussocks, disused mammal burrows and anthills all present. Overall, this constitutes a high-quality reptile habitat.

3.3.36. Figure 3.18 below demonstrates an example of the habitat present.

Figure 3.18 Site ARG habitat example

3.4. Reptile Population Survey Results

3.4.1. Surveys identified the presence of all four common reptiles within 100m of the scheme, with at least one species recorded at 17 of the 18 surveyed sites. All four common species were recorded at 4 of the 18 sites. Eleven of the 18 survey sites were identified as having good or exceptional reptile populations (site 2, 3, 6, 8,10, 41, 43, 44, 46, 47, and 49), along with the site monitored by SGARG, as shown in table 4.

3.4.2. Slow worms were present at all sites except site 44. Slow worm populations were low (>5) at 7 of the 16 positive sites and good (5-20) at 8 sites. The highest slowworm population recorded in one visit was at site 47, with 36 individuals and an exceptional population score.

3.4.3. Common lizards were present at 13 sites with low populations at 6 sites and good populations at 7 sites.

3.4.4. Grass snakes were present at 4 sites with low populations at each. All 4 (6, 8, 41, 45) sites had a peak count of 1.

3.4.5. Adders were present at 8 of the sites. All sites had low scores except the site monitored by SGARG which had a peak count of 5 giving it a good population score.

3.4.6. No reptiles were identified at site 48, which is likely due to the poorer quality habitat and levels of disturbance from the public and from grazing livestock.

3.4.7. The results from each survey are discussed in detail below. Sites are grouped into areas that have similar species abundance. Appendix D displays peak count results for all reptiles.

Site 2 (Adder 5) and site 6 (Adder 1)

3.4.8. Both sites had good populations of both slow worms and common lizards. In general, the peak counts for reptiles were much higher in the late spring/early summer (June). Site 2 was monitored across 2018 and 2019 and peak counts were much higher in the 2019 period. Site 6 was started in March 2019 and peak counts were much higher towards the end of the June survey period. Site 6 also had the presence of grass snakes and adders, both with low populations counts. Site 6 had a peak count of 3 adders. At both sites, more adults of both slow worms and lizards were present than sub-adult or juveniles.

Site 3, 39, 45

3.4.9. Slow worms accounted for the majority of reptiles present at site 3, 39 and 45, with the exception of 45 where there was one grass snake recorded on 2 occasions and site 39 where 1 common lizard was recorded on one occasion. In general, peak counts per day were highest at the start and end of the survey season (April-September). Site 45 and 39 had a low population of slow worm and site 3 had a peak count of 6 slow worm giving it a good population score.

3.4.10. Site 45 had rotated grazing throughout the monitoring period, potentially impacting results.

Site 18 (Adder 18), 41 and 49 (Adder 7)

3.4.11. Site 18, 41 and 49 all had populations of slow worms and adders with no common lizards. Site 41 also 1 adult grass snake individual spotted twice in September of the 2018 survey season, and one juvenile grass snake was spotted in the summer 2019 surveys. Slow worm populations at site 41 and 49 had peak counts of 9 and 6 respectively and site 18 had a low population score with a peak count of 1.

3.4.12. All 3 sites had low populations scores for adders with the peak counts being less than 5 individuals per survey. Total reptile counts were a lot higher in the 2019 May-June survey period compared to other survey times.

Site 8, 10 and 44 (Adder 8)

3.4.13. Site 8, 10 and 44 all had good population scored for common lizards. Site 8 also 1 adult grass snake individual spotted during the spring 2019 survey season. Slow worm populations were present at site 8 and 10 with low populations scores but none were recorded at site 44.

3.4.14. Common lizards in generally were more abundant in September 2018 particularly at site 44 with a peak count of 19.

Site 21, 43 (Adder 43) and 46 (Adder 6)

3.4.15. Slow worms and common lizards accounted for all reptiles present at site 21, 43 and 46. In general, peak counts per day were highest during the 2019 survey season. More juvenile slow worms and common lizards were found during the late 2018 survey period than in the 2019 survey period, but this reflects the later time of year that these sites were surveyed in 2018. Peak counts went up significantly from May – July.

Site 47 (Adder 9)

3.4.16. Slow worms and common lizards accounted for all reptiles present at site 47. This site is the only site with an exceptional population score for slow worms with a peak count of 36 in one survey day. Common lizard peak count was 19 giving a good population score.

3.4.17. In general, peak counts per day were highest during the 2019 survey season and were low during the 2018 September surveys.

Site 25 and ARG site

3.4.18. Site 25 had low populations scores for slow worms and common lizard with a peak count of 2 and 1 respectively. Adders were present at this site but only recorded during the June and July surveys of 2019, with only 3 individuals being recorded. In generally at this site more individuals were found during the June and July surveys than in the months prior. This site was no monitored in 2018.

3.4.19. The site currently monitored by SGARG will continue to be monitored. To date (July 2019) 84 reptiles have been found at the site, with good populations scores for slow worms and common lizards and the only site to have a good population score for adders. Following the trend of all the other sites more reptiles have been found in the later part of the 2019 survey period than previous months. Courtship male adder dancing and mating were observed at this site on more than one occasion.

Overall Survey Results

3.4.20. A summary of the number of reptiles recorded in each survey site during the surveys is presented in Table 4 below, together with calculated reptile densities and population categories. Only results for the reptiles species found are displayed in Table 4. Full results including tile densities, full weather conditions and survey results are presented in Appendix E.

Table 4 Reptile survey results by species and survey site

Species	Total number recorded over 20 visits	Max number recorded over single visit	Area of reptile habitat (Ha)	Population Score (Refer to Table 1)	Population Density (/Ha)* (Table 2)
Site 2					
Slow worm	54	8	0.14	Good	Medium
Common Lizard	34	6	0.14	Good	Medium
Adder	7	1	0.14	Low	High
Site 3					
Slow worm	36	6	0.18	Good	Low
Site 6					
Slow worm	41	7	1.57	Good	Low
Common Lizard	58	12	1.57	Good	Low
Adder	15	3	1.57	Low	Low
Grass Snake	1	1	1.57	Low	Low
Site 8					
Slow worm	15	5	0.66	Good	Low
Common Lizard	19	5	0.66	Good	Low
Grass Snake	5	1	0.66	Low	Low
Adder	2	1	0.66	Low	Low
Site 10					
Slow worm	13	4	1.03	Low	Low
Common Lizard	23	5	1.03	Good	Low
Site 18					
Slow worm	3	1	0.29	Low	Low
Common Lizard	1	1	0.29	Low	Low
Adder	14	2	0.29	Low	High
Site 21					
Slow worm	14	3	0.26	Low	Low
Common Lizard	14	4	0.26	Low	Low
Site 25					
Slow worm	10	2	2	Low	Low
Common Lizard	6	2	2	Low	Low
Adder	3	1	2	Low	Low
Site 39					
Slow worm	7	2	0.25	Low	Low
Common Lizard	1	1	0.25	Low	Low
Site 41					
Slow worm	48	9	0.39	Good	Low
Common Lizard	1	1	0.39	Low	Low
Adder	1	1	0.39	Low	Medium
Grass Snake	3	1	0.39	Low	Medium
Site 43					
Slow worm	20	7	2.91	Good	Low
Common Lizard	9	2	2.91	Low	Low
Site 44					
Common Lizard	59	19	1.33	Good	Low
Site 45					
Slow worm	11	1	0.69	Low	Low
Grass Snake	2	1	0.69	Low	Low
Site 46					
Slow worm	48	9	0.56	Good	Low
Common Lizard	1	1	0.56	Low	Low

Site 47					
Slow worm	101	36	0.61	Exceptional	Medium
Common Lizard	77	19	0.61	Good	Medium
Site 49					
Slow worm	21	6	0.19	Good	Low
Adder	3	1	0.19	Low	High
ARG Site					
Slow worm	90	28	1.88	Exceptional	Low
Common Lizard	25	5	1.88	Good	Low
Adder	15	5	1.88	Good	Medium
Grass Snake	3	1	1.88	Low	Low

3.5. Assessment of importance

3.5.1. As per the criteria described in section 2.3.10, each site was assessed to evaluate it's importance for reptiles. Sites 2, 6, 8, 18, 25, 41, 47 and ARG were assessed as being important reptile sites. Table 5 below provides full results for the assessment of each site against every criterion.

Table 5 Assessment of importance

Survey site	Three or more reptile species?	Two snake species?	Exceptional population of one species?	Assemblage of species scoring at least 4?	Significant regional importance?	Important site?
2	Yes			Yes		Yes
3						
6	Yes	Yes		Yes		Yes
8	Yes	Yes		Yes		Yes
10						
18	Yes					Yes
21						
25	Yes					Yes
39						
41	Yes	Yes		Yes		Yes
43						
44						
45						
46						
47			Yes	Yes		Yes
48						
49						
ARG	Yes	Yes	Yes	Yes		Yes

3.6. Summary

3.6.1. The scheme area surveyed for reptiles (100m from Option 30) supports at all 4 reptile species, with some areas supporting good and exceptional population of slow worms, common lizards and adders. Grass snake were only recorded at a low population. Widespread reptiles are locally common in Gloucestershire, however slow worms are part of a South Gloucestershire BAP, as well as adders which are a UK Post-2010 Biodiversity Framework priority species.

3.6.2. Considering the presence of adders at 8 sites, particularly the ARG site with a good population score and the observation of adder breeding behaviour, habitats within 100m of the scheme should be considered of high conservation value for adders and connectivity between these identified populations should be given consideration.

4. Conclusion

4.1.1. Reptiles have been found in 17 of the 18 areas that were surveyed within 100m of the scheme. All 4 species of widespread reptile were recorded at sites 6, 8, 41 and ARG.

4.1.2. Slow worm populations were found at all sites except sites 44 and 48. Slow worm populations were good or exceptional at 10 of the 17 sites. Sites 47 and ARG have exceptional populations of slow worms. Common lizards were found at 14 sites; 8 with good populations and 6 with low populations.

4.1.3. Grass snakes and adders were also found at a number of sites within 100m of the scheme. Site 6, 8, 41, 45 and ARG all had low population scores for grass snakes with a peak count of 1 at each. Adders proved slightly more abundant with populations present at 8 of the surveyed sites. Of the 8 sites with adders present, 7 had low population scores and 1 (ARG site) had a good population with breeding behaviours observed.

4.1.4. Sites 2, 6, 8, 18, 25, 41, 47 and the ARG site were assessed as being important reptile sites. Eleven of the 18 survey sites were identified as having good or exceptional reptile populations of one or more species (site 2, 3, 6, 8,10, 41, 43, 44, 46, 47, and 49).

Appendix A – Results from GCER

Scientific Name	Common Name	Location	Grid Reference	Distance from Scheme (m)	Direction	Year
Vipera berus	Adder	CRICKLEY HILL and BARROW WAKE SSSI	SO927162	452	N	2011
Vipera berus	Adder	Leckhampton HillSO9417	SO945177	1860	NE	2009
Vipera berus	Adder	Cotswold Hills Golf Club	SO950170	1710	NE	2006
Vipera berus	Adder	Crickley Hill Country Park	SO927161	378	N	2016
Vipera berus	Adder	Crickley Hill Country Park	SO927161	378	N	2016
Vipera berus	Adder	CRICKLEY HILL and BARROW WAKE SSSI	SO929161	234	N	2016
Zootoca vivipara	Common Lizard	Near Birdlip	SO921133	1470	SW	2011
Zootoca vivipara	Common Lizard	CRICKLEY HILL and BARROW WAKE SSSI	SO926161	386	NE	2007
Zootoca vivipara	Common Lizard	Leckhampton HillSO9417	SO946177	1940	NE	2009
Zootoca vivipara	Common Lizard	Cotswold Hills Golf Course	SO950170	1740	NE	2007
Zootoca vivipara	Common Lizard	Leckhampton Hill	SO946177	1940	NE	2009
Zootoca vivipara	Common Lizard	Cotswold Hills Golf Course	SO950170	1740	NE	2007
Natrix natrix	Grass Snake	Witcombe Reservoir	SO903146	1638	S	2014
Natrix natrix	Grass Snake	Badgeworth, Primrose Vale Farm	SO904171	1504	NW	2011
Natrix natrix	Grass Snake	Bentham	SO915161	507	NW	2008
Anguis fragilis	Slow-worm	CRICKLEY HILL and BARROW WAKE SSSI	SO927163	516	N	2010

Notes

Legend

Records

- reptile, Adder
- reptile, Common Lizard
- reptile, Grass Snake
- reptile, Slow-worm

Rev	Date	Amendment Details	D	C	A
P01	03/10/18	First Revision	DB	AE	SM

Mott MacDonald Sweco

Client: highways england

Drawing Status: For Information

Suitability: S02

Project Title: A417 'Missing Link' at Air Balloon

Drawing Title: Biological Records - Reptiles

Scale	Designed	Drawn	Checked	Approved
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Original Size	**Date**	**Date**	**Date**	**Date**
A3	30/10/2018	30/10/2018	29/10/2018	30/10/2018

Drawing Number: HE PIN | Originator | Volume

551505 - MMSJV - EBD - 000 - DR - LB - 00054

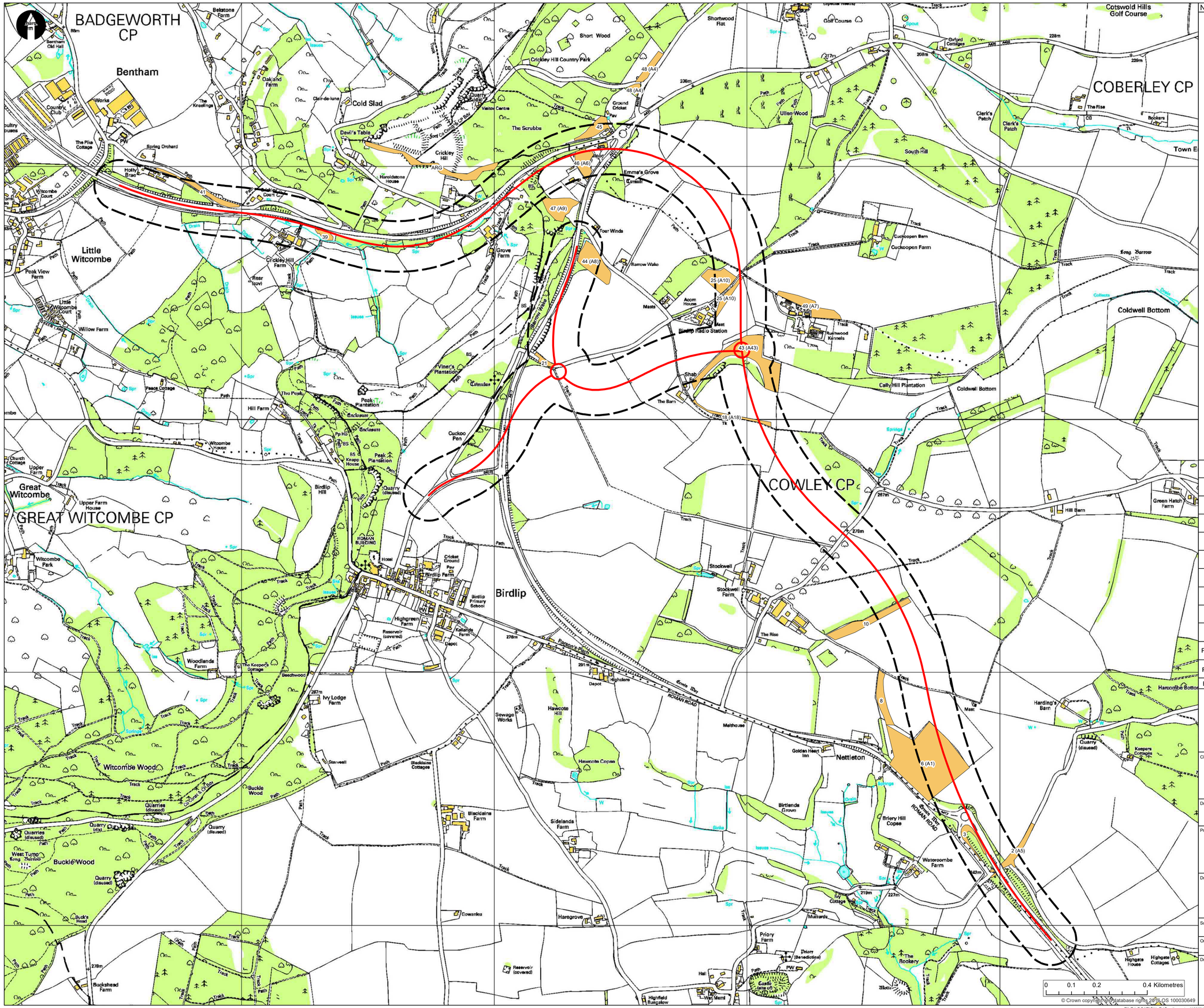
Location | Type | Role | Number

Project Ref. No.: 551505

Revision: P01

FILE LOCATION: P:\Southampton\HWA\GIS\Projects\353982 - A417\Ecology\Biological records\Biological records - Reptile and Amphibians.mxd

Appendix B – Location of reptile survey sites 2018 and 2019



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Notes

Legend

- Scheme Centreline (at time of survey)
- 100m Scheme Buffer Reptile
- Sites

Rev	Date	Amendment Details	Drawn	Chk'd	App'd
P02	13/11/19	Second Revision	TW	GG	SM
P01	05/06/19	First Revision	TW	GG	SM

Mott MacDonald Sweco

Client

highways england

Drawing Status

For Information

Suitability

S2

Project Title

A417 Missing Link

Drawing Title

Reptile Site Locations

Scale	Designed	Drawn	Checked	Approved
1:7,000	TW	TW	VH	SM
Original Size	Date	Date	Date	Date
A1	30/07/19	30/07/19	30/07/19	0/07/19

Drawing Number

HE PIN | Originator | Volume

551505 - MMSJV - EBD -

000 - DR - LB - 00055

Location | Type | Role | Number

Project Ref. No.

551505

Revision

P02

FILE LOCATION: P:\Southampton\HWA\GIS\Projects\353982 - A417\Ecology\GIS_2019\SURVEY_MAPS\REPTILES\TW Update 130619\Reptiles_TW_130619.mxd

Appendix C – Location of adder survey sites 2018 and 2019

Notes

Legend

- Scheme Centreline (at time of survey)
- 100m Scheme Buffer
- Adder Sites

Rev	Date	Amendment Details	Drawn	Chk'd	App'd
P02	13/11/19	Second Revision	TW	VH	SM
P01	05/06/19	First Revision	TW	VH	SM

Mott MacDonald Sweco

Client: highways england

Drawing Status: For Information

Suitability: S02

Project Title: A417 Missing Link

Drawing Title: Adder Site Locations

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Drawing Number: HE PIN | Originator | Volume | Location | Type | Role | Number

551505 - MMSJV - EBD - 000 - DR - LB - 00056

Project Ref. No.: 551505

Revision: P02

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Appendix D – Results map for reptiles 2018 and 2019

Notes

Legend

- Scheme centreline (at time of survey)
- 100 Metre Buffer
- Reptile Sites

PEAK SPECIES COUNT

- Adder
- Common lizard
- Grass snake
- Slow worm

Slow worm	9
Common Lizard	1
Adder	1
Grass Snake	1

Slow worm	28
Common Lizard	5
Adder	5
Grass Snake	1

Slow worm	36
Common Lizard	19

Slow worm	2
Common Lizard	1

Slow worm	3
Common Lizard	4

Rev	Date	Amendment Details	Drawn	Chk'd	App'd
P03	13/11/19	THIRD REVISION	JW	VH	SM
P02	25/09/19	SECOND REVISION	JW	VH	SM
P01	23/07/19	FIRST REVISION	TW	VH	SM

Mott MacDonald Sweco

Client: highways england

Drawing Status: S02

Suitability: FOR INFORMATION

Project Title: A417 MISSING LINK

Drawing Title: REPTILE SURVEY SITES PEAK COUNT

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Project Ref. No.: 551505

Revision: P03

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Notes

Legend

- Scheme centreline (at time of survey)
- 100 Metre Buffer
- Reptile Sites

PEAK SPECIES COUNT

- Adder
- Common lizard
- Grass snake
- Slow worm

Slow worm	28
Common Lizard	5
Adder	5
Grass Snake	1

Slow worm	1
Grass Snake	1

Slow worm	9
Common Lizard	1

Slow worm	36
Common Lizard	19

Common Lizard	19

Slow worm	2
Common Lizard	2
Adder	1

Slow worm	6
Adder	1

Slow worm	7
Common Lizard	2

Slow worm	3
Common Lizard	4

Slow worm	1
Common Lizard	1
Adder	2

Rev	Date	Amendment Details	Drawn	Chk'd	App'd
P03	13/11/19	THIRD REVISION	JW	VH	SM
P02	25/09/19	SECOND REVISION	JW	VH	SM
P01	23/07/19	FIRST REVISION	TW	VH	SM

Mott MacDonald Sweco

Client: highways england

Drawing Status: S02

Suitability: FOR INFORMATION

Project Title: A417 MISSING LINK

Drawing Title: REPTILE SURVEY SITES PEAK COUNT

PAGE 2 OF 3

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551505 - MMSJV - EBD -
Location | Type | Role | Number
000 - DR - LB - 00057

Project Ref. No.: 551505

Revision: P03

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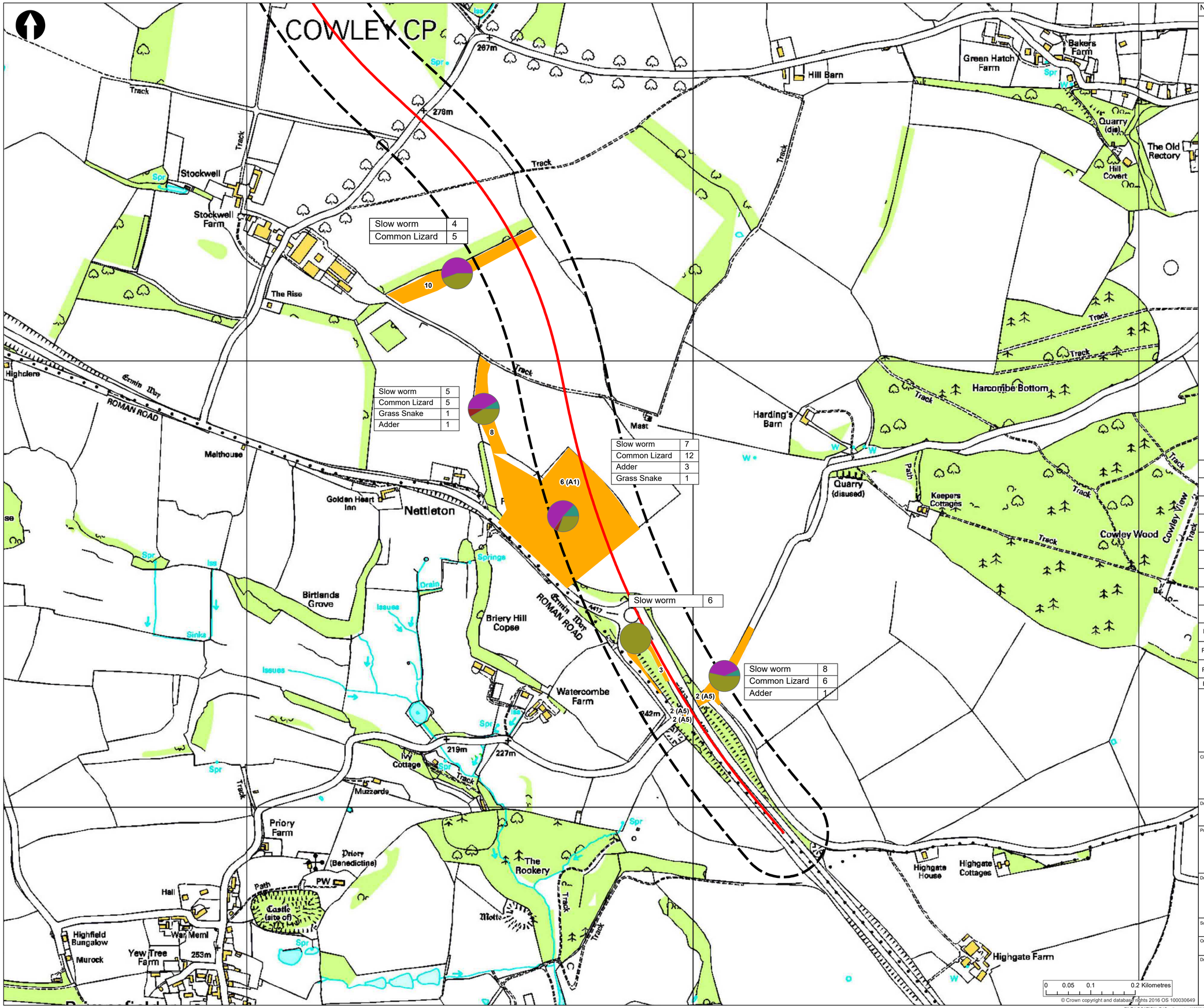

Notes

Legend

- Scheme centreline (at time of survey)
- 100 Metre Buffer
- Reptile Sites

PEAK SPECIES COUNT

- Adder
- Common lizard
- Grass snake
- Slow worm

Rev	Date	Amendment Details	Drawn	Chk'd	App'd
P03	13/11/19	THIRD REVISION	JW	VH	SM
P02	25/09/19	SECOND REVISION	JW	VH	SM
P01	23/07/19	FIRST REVISION	TW	VH	SM

Mott MacDonald Sweco

Client: highways england

Drawing Status: S02

Suitability: FOR INFORMATION

Project Title: A417 MISSING LINK

Drawing Title: REPTILE SURVEY SITES PEAK COUNT

PAGE 3 OF 3

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Project Ref. No.: 551505

Revision: P03

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Appendix E – Full survey results 2018 and 2019

Site	Site set up date	Site size (Ha)	Land parcel	VISIT NO	Survey Date	Surveyors	Start time	End time	Weather conditions: Start Temp (˚C)	End Temp (˚C)	Cloud (0-8)	Wind (0-8)	Notes	No. of Slow Worms: Juvenile	Sub Adult	Adult M	Adult F	Unknown	Total SW per visit	No. of Common Lizards: Juvenile	Sub Adult	Adult M	Adult F	Unknown	Total CL per visit	No. of Adders: Juvenile	Sub Adult	Adult M	Adult F	Unknown	Total Adder per visit	No. of Grass Snakes: Juvenile	Sub Adult	Adult M	Adult F	Unknown	Total GS per visit
2 (A5)	02/04/2019 BC	0.14	GR282795/ HE	Total Catch										5	6	33	7	3	54	2	6	15	4	7	34	1	0	5	0	1	7	0	0	0	0	0	0
				1	03/09/2018	ET MW	12:00;00	12:30:00	23	23	6	2							0						0					1	1						0
				2	06/09/2018	TD	12:00:00	12:25:00	21	21	7	3						2	2			1		4	5	1					1						0
				3	12/09/2018	MW MC	12:00:00	12:30:00	16	16	7	1		1		2			3	1					1						0						0
				4	14/09/2018	MW MC	10:30:00	11:00:00	16	16	7	2				2			2			1		2	3						0						0
				5	18/09/2018	MW NB	10:30:00	11:00:00	19	19	7	6							0						0						0						0
				6	20/09/2018	JD Mush	13:30:00	13:51:00	15	15	7	3							0						0						0						0
				7	26/09/2018	JD MEH	10:50:00	11:04:00	15	17	1	1							0						0						0						0
				8	27/09/2018	ET HL	10:00:00	11:40:00	16	16	2	2							0						0			1			1						0
				9	28/03/2019	ET HL	12:00	12:30	11	11	2	1							0						0			1			1						0
				10	01/04/2019	JW SD	14:00:00	14:30:00	14	14	0	1				2	1		3			1			1			1			1						0
				11	10/04/2019	JDD BC	17:50:00	18:15:00	10	9	5	2				2			2						0			1			1						0
				12	11/04/2019	JDD BC	16:10:00	16:30:00	11	10	1	1				3			3				1		1						0						0
				13	15/04/2019	JDD JA	15:30:00	16:00:00	12	11	7	4		1		4			5			1	1	1	3			1			1						0
				14	17/04/2019	JDD JA	13:00:00	13:30:00	13	13	7	2				2			2			1	1		2						0						0
				15	26/04/2019	MC TW	10:30:00	11:00:00	13	13	7	3	sunny spells	1		1	1		3	1			5		6						0						0
				16	29/04/2019	JD JDD	15:30:00	15:55:00	14	14	7	2			1	2	2		5			1		2	4						0						0
				17	30/04/2019	JD JDD	15:25:00	15:45:00	16	16	3	3		1	1	1	1		4				1		1						0						0
				18	01/05/2019	RW BG	09:25	10:00	12	14	6	1			1	1			2						0						0						0
				19	02/05/2019	RW BG	10:25	10:53	10	11	5	2		1		5	2		8			1	3	1	5						0						0
				20	14/05/2019	RW SB	14:20:00	14:35:00	18	18	1	3			1				1						0						0						0
				21	15/05/2019	RW SB	10:20	10:35	13	13	1	1			1	1		1	3						0						0						0
				22	16/05/2019	JDD BC	09:55:00	10:15:00	13	13	3	2			1	5			6			1	1		2						0						0
3	03/05/2019	0.18	GR298835/HE	Total Catch										12	7	10	7	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				1	29/06/2018	TD MW	10:15:00	10:37:00	17	18	0	1			4		2		6						0						0						0
				2	03/09/2018	NB	14:16:00	14:25:00	19	19	8	2							0						0						0						0
				3	06/09/2018	TD MW	12:30:00	12:40:00	21	21	7	2							0						0						0						0
				4	14/05/2019	RW JDD	14:05:00	14:20:00	18	18	1	4							0						0						0						0
				5	16/05/2019	RW JDD	10:15:00	10:30:00	13	13	2	2							0						0						0						0
				6	21/05/2019	JD MC	11:15	11:35	14	14	2	2	sun exposure with few cloud.			1	1		2						0						0						0
				7	24/05/2019	JD MC	09:45	10:00	16	16	1	2			1	2			3						0						0						0
				8	01/07/2019	RW KG	12:00	12:15	17	17	1	2							0						0						0						0
				9	02/07/2019	RW KG	11:00	11:15	17	17	2	1				1			1						0						0						0
				10	03/07/2019	RW KG	10:45	11:00	17	17		1			2	1	1		4						0						0						0
				11	09/07/2019	JW KG	10:00:00	10:20:00	19	19	2	1		2			1		3						0						0						0
				12	11/07/2019	JW KG	10:00:00	10:20:00	18	18	8	1		4		1	1		6						0						0						0
				13	12/07/2019	JW KG	09:45:00	10:00:00	19	19	4	2		3		2	1		6						0						0						0
				14	16/07/2019	GG BG	08:40:00	09:00:00	19	20	3	0	Limited direct sun but warm						0						0						0						0
				15	17/07/2019	GG BG	08:00:00	08:30:00	18	19	4	0	cloudy morning	1		1			2						0						0						0
				16	18/07/2019	GG BG	09:45:00	10:00:00	18	19	8	2	Cloudy but hot	2		1			3						0						0						0
				17	25/09/2019	NB KS	13:00:00	13:15:00	16	16	8	1	overcast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				18															0						0						0						0
				19															0						0						0						0
				20															0						0						0						0
6 (A1)	09/04/2019	5.63	3298/ Hanson Q	Total Catch										1	7	17	13	3	41	0	14	5	27	12	58	1	2	2	9	1	15	0	0	0	0	1	1
				1	27/03/2019	ET HL	13:00	13:30	11	11	2	1	hy continuing on from a weekend of sunshine						0					1	1						0						0
				2	28/03/2019	ET HL	13:00	13:30	11	11	2	1	hy continuing on from a weekend of sunshine						0					1	1						0						0
				3	10/04/2019	JDD BC	17:30	17:45	11	10	2	2							0						0						0						0
				4	11/04/2019	JDD BC	15:10	16:00	11	11	1	10							0						0						0						0
				5	15/04/2019	JDD JA	13:00:00	13:45:00	10	11	5	3							0				1	1	2						0						0
				6	16/04/2019	JDD JA	15:45	16:40:00	10	10	8	1	precipitation, occasional spots of drizzle.						0						0						0						0
				7	26/04/2019	MC TW	14:00	14:30	10	10	3	2							0						0						0						0
				8	29/04/2019	JD JDD	14:30	15:00	14	14	3	2							0						0			1			1						0
				9	30/04/2019	JD JDD	16:10:00	16:50:00	16	16	3	2			1	1			2		2	1	1		4						0						0
				10	01/05/2019	JD JDD	09:45	11:15	13	13	4	2			1				1		8		4		12			1			1						0
				11	13/05/2019	DL NB	15:00	15:45	15	15	0	4	warm, windy, sunny day		1				1				2	2	4			1			1						0
				12	15/05/2019	RW SB	09:50:00	10:10:00	13	13	1	1				2		1	3						0			1			1						0
				13	21/05/2019	JD JDD	10:00	10:50	14	14	1	1							0		2	1	3	2	8		2		1		3						0
				14	31/05/2019	JDD JD	09:55	11:05	16	16	7	2	ost full overcast warm with wind chill		1	1	2		4		1	1	7		9	1			2		3						0
				15	12/06/2019	JD JC	15:30	16:30	11	12	7	1	y with no sun, survey started 3 hours after de		3	2	1		6						0				1		1						0
				16	19/06/2019	JDD TW	11:20:00	12:00:00	15	15	8	1				2	5		7				1		1				1		1						0
				17	21/06/2019	MC TW	09:20	10:05	15	16	3	2		1		2	2		5				4	1	5				2		2					1	1
				18	26/06/2019	DL JC	12:00	12:45	18	18	5	2				3	1		4		1	2	1		4						0						0
				19	28/06/2019	JC LF	09:29	10:05	15	16	2	4				1	1	2	4					1	1					1	1						0
				20	02/07/2019	GG LF	13:30	14:30	18	18	3	2				3	1		4				3	3	6						0						0
8	15/04/2019	0.66	159309/ Besterm	Total Catch										3	1	5	6	0	15	0	5	1	10	3	19	0	2	0	0	0	2	0	0	0	5	0	5
				1	27/06/2018	RW TS	09:21	09:47	18	18	0	3					1		1						0						0						0
				2	29/06/2018	RW TS	08:35	09:15	14	15	0	1							0						0						0						0
				3	06/09/2018	JD MEH	11:55	12:30	17	18		2				1			1				1		1						0						0
				4	11/09/2018	JD MEH	11:20	11:50	16	16	8	4		1		1			2						0						0						0
				5	13/09/2018	JD MEH	11:30	11:55	17	17	2	2	light drizzle						0						0						0						0
				6	18/09/2018	MC TW	10:30	11:00	19	19	7	6		1					1						0						0						0
				7	27/09/2018	MC TW	10:50	11:20	15	15	0	2							0						0						0						0
				8	26/04/2019	MC TW	09:30	09:45	12	12	6	3	cool sunny spells						0						0						0						0
				9	29/04/2019	JD JDD	15:00	15:25	13	13	3	1							0						0						0						0
				10	30/04/2019	JD JDD	17:00:00	17:10	16	16	3	2							0				1		1						0						0
				11	01/05/2019	JD JDD	11:20	11:40	13	14	5	2							0		1			1	2						0				1		1
				12	21/05/2019	JD MC	10:52	11:07	14	15	1	2	exposure with few cloud. Suboptimal						0						0						0						0
				13	31/05/2019	JD JDD	11:10	11:30	17	17	7	2	warm temp with a cool breese but almost full cloud cover				1		1		1	1	3		5						0				1		1
				14	19/06/2019	JDD TW	12:20	13:00	15	15	8	1							0				1		1						0				1		1
				15	21/06/2019	DL JC	08:50	09:20	15	15	3	2							0		3		1		4						0				1		1
				16	26/06/2019	DL JC	12:50	13:10	18	18	6	2			1				1						0						0				1		1
				17	28/06/2019	LF JC	10:05	10:25	16	16	2	4							0						0						0						0
				18	03/07/2019	GG LF	10:05	10:25	16	16	2	1					1		1						0						0						0
				19	09/07/2019	JW KG	10:30:00	11:00:00	19	19	2	1				1	1		2				1	1	2		1				1						0
				20	10/07/2019	JW KG	10:00:00	10:30:00	19	19	2	1		1		2	2		5				2	1	3		1				1						0
				Total Catch										3	2	1	7	0	13	7	5	1	3	7	23	0	0	0	0	0	0	0	0	0	0	0	0
				1	27/06/2018	RW TS	09:58	10:15	18	18	0	3							0						0						0						0
				2	29/06/2018	RW TS	09:20:00	09:45:00	15	17	0	1			1				1						0						0						0
				3	06/09/2018	DL HL	11:50	12:15	17	17	6	2		1	1	1	1		4						0						0						0
				4	11/09/2018	RW TS	09:46	10:10:00	17	17	8	4		1					1		4		1		5						0						0
				5	13/09/2018	RW TS	10:15	10:45	13	15	1	2							0						0						0						0
				6	18/09/2018	RW Mush	11:30	12:00	19	19	7	6		1					1						0						0						0
				7	20/09/2018	RW Mush	14:10	14:30	14	14	7	4							0						0						0						0
				8	27/09/2018	RW Mush	11:25	11:35	16	16	0	3							0						0						0						0

10		1.03	159309/ Besterm	9	09/10/2018	RW	12:10	12:40:00	15	16	1	3							0						0						0						0
				10	18/10/2018	RW	13:00	13:40:00	10	11	7	1							0						0						0						0
				11	16/07/2019	GG BG	09:00:00	09:30:00	18	19	3	0	Hot and muggy						0				1	1	2						0						0
				12	17/07/2019	GG BG	13:00:00	13:30:00	19	20	4	0	Limited direct sun but warm						0					3	3						0						0
				13	18/07/2019	GG BG	09:00:00	09:40:00	17	18	8	2	cloudy but still warm						0				1	1	2						0						0
				14	09/09/2019	JW & JDD	09:20:00	09:40:00	14	14	7	2	cloudy but warm						0						0						0						0
				15	10/09/2019	JW & JDD	17:20:00	17:30:00	14	14	2	3	sunny, mats warm.						0			1			1						0						0
				16	11/09/2019	JW & JDD	12:15:00	12:25:00	18	18	8	3	t but hazy, sun still warm through clouds				2		2	3	1				4						0						0
				17	16/09/2019	GG and YM	17:30:00	17:40:00	18	17	6	0	warm evening						0						0						0						0
				18	17/09/2019	GG and YM	09:51:00	10:15:00	13	13	2	0	warm morning going to be hot				2		2	1					1						0						0
				19	17/09/2019	GG and YM	14:35:00	14:50:00	17	18	2	0	hot afternoon				1		1	2				2	4						0						0
				20	18/09/2019	GG and YM	11:30:00	00:00:00	16	17	0	0					1		1	1					1						0						0
18 (A18)	08/04/2019	0.29	GR87761 - Mende	**Total Catch**										**0**	**1**	**0**	**2**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**13**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**0**
				1	25/04/2019	MC TW	15:00	15:10	13		4	0	showers/sunny spells						0						0						0						0
				2	29/04/2019	JD JDD	17:40:00	17:45:00	14	14	3	2							0						0						0						0
				3	30/04/2019	JD JDD	10:30:00	10:40:00	10	11	3	3							0						0						0						0
				4	02/05/2019	JD JDD	11:00	11:30	11	11	5	2							0						0						0						0
				5	07/05/2019	DL JDD	16:10:00	16:20:00	12	12	5	3							0						0						0						0
				6	10/05/2019	JDD RW	10:10	10:15	11	11	4	1							0						0						0						0
				7	16/05/2019	RW SB	08:10	08:20	12	12	1	2							0						0						0						0
				8	17/05/2019	DBl RM	10:10	10:20	10	10	8	2							0						0				2		2						0
				9	21/05/2019	DBl RM	09:50	10:00	18	18	5	2							0						0				1		1						0
				10	24/05/2019	JD MC	09:10	09:30	14	14	1	2	nshine with few scattered cloud. light wind				1		1						0				1		1						0
				11	12/06/2019	CD DL	14:00	14:20	13	13	5	2	ier in day, but some heat in felts and tins.						0						0				1		1						0
				12	17/06/2019	JDD WG	15:05:00	15:20:00	16	16	7	2							0						0			1	1		2						0
				13	19/06/2019	RW MC	13:45	13:53	15	15	7	2							0						0				1		1						0
				14	20/06/2019	JDD TW	10:35:00	10:45	15	15	5	3			1				1						0				1		1						0
				15	21/06/2019	MC	10:15	10:25	15	14	7	3							0						0						0						0
				16	26/06/2019	RW LF	12:20	12:30	18	18	8	2							0						0				1		1						0
				17	27/06/2019	LF JC	11:31	11:45	18	18	0	2							0						0						0						0
				18	2/07/2019 (early	GG LF	11:31	11:45	18	18	0	2							0			1			1				2		2						0
				19	07/2019 (afterno	GG LF	15:31	15:45	18	18	0	2					1		1						0				2		2						0
				20	03/07/2019	GG LF	15:31	15:45	18	18	0	2							0						0						0						0
21	02/04/2019	0.26	GR135368/ HE	**Total Catch**										**7**	**2**	**3**	**2**	**0**	**14**	**0**	**7**	**1**	**3**	**3**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
				1	27/06/2018	RC ME	10:29	10:34	17	17	0	3							0						0						0						0
				2	04/09/2018	RC ME	14:34	14:50	15	15	2	2		1					1						0						0						0
				3	06/09/2018	RC ME	12:30	13:30	17	17	8	1							0						0						0						0
				4	14/09/2018	HW MA	10:55	11:10	13	15	7	2		3					3		3		1		4						0						0
				5	18/09/2018	HW MA	13:50:00	14:00:00	18	17	8	3		1					1						0						0						0
				6	20/09/2018	JD MEH	10:30	10:41	13	14	1	1							0						0						0						0
				7	01/10/2018	RC RW	14:30	14:45	14	14	4	3							0						0						0						0
				8	09/10/2018	RC RW	12:30:00	13:05:00	16	16	4	3							0						0						0						0
				9	18/10/2018	RW	14:35	14:45	13	13	7	3							0						0						0						0
				10	30/04/2019	JD	09:15	09:25	11	11	2	2							0						0						0						0
				11	01/05/2019	RW BG	10.15	10.35	14	14	4	2			1				1					1	1						0						0
				12	02/05/2019	JD JDD	14:30	14:45	11	12	6	3							0		1				1						0						0
				13	10/05/2019	JDD RW	11:50	12:00	10	10	6	2				1			1					1	1						0						0
				14	14/05/2019	RW SB	15:05	15:25	18	18	1	2							0						0						0						0
				15	21/05/2019	JD MC	12:00	12:10	14	14	3	2					1		1		1	1			2						0						0
				16	17/06/2019	JDD WG	13:55	14:15	16	16	7	4			1		1		2		2		1		3						0						0
				17	20/06/2019	MC TW	14:40	14:50	16	16	7	3		2		1			3				1		1						0						0
				18	26/06/2019	RW LF	13:39	13:55	17	17	8	3							0						0						0						0
				19	27/06/2019	LF JC	11:18	11:27:00	18	18	0	2				1			1						0						0						0
				20	01/07/2019	RW KG	12:40	12:50	17	17	2	2							0					1	1						0						0
25 (A10)	10/04/2019	1.41	R252644/Alan Di	**Total Catch**										**3**	**0**	**3**	**4**	**0**	**10**	**0**	**3**	**0**	**2**	**1**	**6**	**0**	**0**	**1**	**1**	**1**	**3**	**0**	**0**	**0**	**0**	**0**	**0**
				1	23/04/2019	MC TW	13:00	13:30	19	19	8	0							0						0						0						0
				2	29/04/2019	JD JDD	16:15	16:33	14	14	3	2							0						0						0						0
				3	30/04/2019	JD JDD	11:40:00	12:00	11	11	3	2							0		1				1						0						0
				4	02/05/2019	JD JDD	11:20	11:35	13	11	6	3							0						0						0						0
				5	07/05/2019	DL JDD	15:00:00	15:41:00	12	12	5	2				1			1				1	1	2						0						0
				6	08/05/2019	DL JDD	14:00	14:30	12	12	5	4							0						0						0						0
				7	10/05/2019	JDD RW	11:05	11:30	10	10	4	2							0						0						0						0
				8	14/05/2019	RW SB	14:40	15:00	18	18	1	2							0						0						0						0
				9	15/05/2019	DL NB	10:30	11:00	17	17	0	2					1		1						0						0						0
				10	16/05/2019	JD PH	10:37	11:00	14	15	2	1							0						0						0						0
				11	20/05/2019	JD MC	12:45	13:20	15	15	5	2		1					1				1		1						0						0
				12	30/05/2019	NB CD	15:15	16:45	18	18	4	2							0						0						0						0
				13	12/06/2019	CD DL	14:30	15:10	13		6	2	er in day, majority of tins/felts cold or wet				1		1						0						0						0
				14	17/06/2019	JDD WG	14:15	14:55	16	16	7	3				1			1		1				1						0						0
				15	20/06/2019	JDD TW	10:55:00	11:15:00	15	15	5	3							0		1				1						0						0
				16	26/06/2019	LF RW	14:25	15:00	17	17	100	2		1		1			2						0						0						0
				17	27/06/2019	DL RW	10:40	11:00	17	17	0	2					1		1						0					1	1						0
				18	02/07/2019	GG LF	10:40	11:00	17	17	0	2							0						0			1			1						0
				19	03/07/2019 (early)	GG LF	10:40	11:00	17	17	0	2		1					1						0						0						0
				20	3/7/19 (late)	GG LF	13:00	14:00	17	17	0	2					1		1						0				1		1						0
39	09/04/2019	0.25	GR382246/ FlyUp	**Total Catch**										**2**	**3**	**1**	**1**	**0**	**7**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
				1	23/04/2019	MC TW	14:00	14:30	20	20	8	0	Muggy but good						0						0						0						0
				2	30/04/2019	RW BG	11:18	11.43	13	13	4	2			1				1						0						0						0
				3	07/05/2019	DL JDD	12:40:00	13:00:00	13	13	6	1							0						0						0						0
				4	14/05/2019	JDD BC	11:40:00	11:50	15	15	1	2					1		1					1	1						0						0
				5	28/05/2019	JD JDD	13:30	13:45	12	12	6	1			2				2						0						0						0
				6	02/07/2019	RW KG	11:05	11:18	17	17	5	1							0						0						0						0
				7	09/07/2019	JW KG	09:40:00	09:55:00	19	19	2	1							0						0						0						0
				8	15/07/2019	GG BG	19:00:00	07:10:00	20	20	0	0	urvey tiles still warm but not in direct sun.						0						0						0						0
				9	16/07/2019	GG BG	08:00:00	08:10:00	18	18	0	0	Muggy and hot						0						0						0						0
				10	23/07/2019	BG JD	05:50:00	06:00:00	15	15	0	1							0						0						0						0
				11	30/07/2019	BG LF	09:05:00	09:20:00	21	21	8	1		1					1						0						0						0
				12	06/08/2019	JDD NB	19:35:00	19:45:00	18	18	5	2							0						0						0						0
				13	13/08/2019	JDD DBL	12:00:00	12:15:00	18	18	4	1		1					1						0						0						0

				14	20/08/2019	DBI JC	09:15:00	09:30:00	16	16	0	1							0						0						0						0
				15	10/09/2019	JW JDD	09:40:00	10:00:00	14	14	7	2				1			1						0						0						0
				16	10/09/2019	JW JDD	17:45:00	18:05:00	14	14	3	1							0						0						0						0
				17	17/09/2019	GG YM	10:00:00	10:15:00	11	11	0	0							0						0						0						0
				18	17/09/2019	GG YM	16:00:00	16:15:00	16	16	0	0							0						0						0						0
				19	23/09/2019	NB KS	10:00:00	10:16:00	16	16	8	1		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				20	23/09/2019	NB KS	12:20:00	12:40:00	16	16	8	1	collected	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	**04/04/2019**	**0.39**	**GR326573/HE**	**Total Catch**										**16**	**4**	**13**	**9**	**6**	**48**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**1**	**3**
				1	06/09/2018	JD MEH	11:20	12:15	16	16	8	1					1	2	3						0						0						0
				2	11/09/2018	JD MEH	10:45	11:15	16	16	8	4		2	2	3	1	1	9						0						0						0
				3	13/09/2018	JD MEH	10:30	11:00	17	17	2	2							0						0						0					1	1
				4	24/09/2018	RC MC	13:30:00	13:50:00	14	14	40	1		1					1						0						0		1				1
				5	26/09/2018	RC MC	12:06	12:27	15	15	7	2		2		1	1		4						0						0						0
				6	01/10/2018	RC MC	13:30:00	14:20:00	12	12									0						0						0						0
				7	03/10/2018	RC MC	11:57	12:15	17	19	6	1		1			1		2						0						0						0
				8	17/04/2019	JDD JA	11:00:00	11:30:00	11	11	6	1							0						0						0						0
				9	30/04/2019	JD JDD	08:45	09:00	10	11	2	1							0						0						0						0
				10	02/05/2019	RW BG	09:20:00	09:45:00	10	11	6	1				2			2						0						0						0
				11	03/05/2019	RW BG	09:30:00	09:45:00	10	10	6	1				1	1		2						0						0						0
				12	08/05/2019	RW PN	13:40:00	13:55:00	12	12	4	1				1			1						0						0						0
				13	20/06/2019	MC TW	14:30	14:40	16	16	7	3		3					3						0						0						0
				14	26/06/2019	DL JC	12:50	13:10	19	19	6	2		4	1	1	1		7						0						0						0
				15	27/06/2019	DL JC	10:25	10:45	15	15	5	2				1		3	4						0						0						0
				16	28/06/2019	LF JC	11:07	11:15	18	18	0	2				1			1						0	1					1						0
				17	01/07/2019	RW KG	13:10	13:30	17	17	2	2			1		1		2					1	1						0						0
				18	02/07/2019	RW KG	10:45	11:00	17	17	5	1					1		1						0						0	1					1
				19	03/07/2019	RW KG	10:00	10:30	17	18	4	1							0						0						0						0
				20	09/07/2019	JW KG	10:00:00	10:30:00	18	18	1	2		3		2	1		6						0						0						0
43 (A43)	**03/04/2019**	**2.91**	**GR87761 - Mende**	**Total Catch**										**1**	**4**	**6**	**9**	**0**	**20**	**0**	**3**	**2**	**2**	**2**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
				1	11/09/2018	JD MEH	09:00	10:30	17	17	7	4		1		1			2						0						0						0
				2	13/09/2018	JD MEH	11:00	11:30	18	18	1	0							0						0						0						0
				3	17/09/2018	JD MEH	14:30	15:00	18	18	7	3							0						0						0						0
				4	20/09/2018	JD MC	13:00	13:30	17	17	6	5							0						0						0						0
				5	24/09/2018	JD MW	14:00:00	14:30:00	14	14	40	1							0						0						0						0
				6	27/09/2018	JD MW	11:35	12:06	17	18	0	1							0						0						0						0
				7	09/10/2018	JDD BC	14:10	14:35	17	17	0	1							0						0						0						0
				8	10/04/2019	JDD BC	15:00	15:40:00	8	9	3	1							0						0						0						0
				9	11/04/2019	JDD BC	11:20	12:00:00	8	9	2	1							0						0						0						0
				10	12/04/2019	JDD BC	10:30	11:30	9	10	3	3				1			1						0						0						0
				11	16/04/2019	JDD JA	17:15:00	18:16:00	10	10	8	2							0			1			1						0						0
				12	23/04/2019	JDD JA	16:30	17:00	18	18	8						1		1		1				1						0						0
				13	25/04/2019	JDD JA	14:45	15:10	13	13	6	1					1		1			1			1						0						0
				14	29/04/2019	JD JDD	17:50	18:15	14	13	4	2							0						0						0						0
				15	30/04/2019	JD JDD	10:40	11:25	10	12	3	3							0						0						0						0
				16	02/05/2019	JD JDD	10:10	10:50	9	9	5	2					1		1		1			1	2						0						0
				17	07/05/2019	DL JDD	16:15:00	17:00:00	13	12	6	3				2	2		4				1		1						0						0
				18	16/05/2019	RW SB	08:20:00	08:50:00	12	12	1	1					1		1						0						0						0
				19	21/05/2019	DB RM	09:15:00	10:00:00	15	16	2	1			2				2		1				1						0						0
				20	30/05/2019	JDD BC	11:00	12:00	18	18	8	3			2	2	3		7				1	1	2						0						0
44 (A8)		**1.33**	**GR160452 - Peart**	**Total Catch**										**0**	**0**	**0**	**0**	**0**	**0**	**19**	**22**	**5**	**6**	**7**	**59**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
				1	12/09/2018	JD MEH	11:20	11:55	14	14	7	1							0		2				2						0						0
				2	14/09/2018	JD JDD	10:18	10:47	16	16	7	2							0		16		3		19						0						0
				3	17/09/2018	JD JDD	14:00	14:30	18	18	7	3							0	9			1	2	12						0						0
				4	20/09/2018	JD JDD	13:30	14:00	17	17	6	6							0	1					1						0						0
				5	24/09/2018	RC MC	13:25	14:00	14	14	4	2							0	7		1	1		9						0						0
				6	02/10/2018	RW RC	11:00:00	11:15:00	15	15	8	3							0						0						0						0
				7	04/10/2018	RC RW	12:23	12:54	15	15	4	1							0	1		1		2	4						0						0
				8	26/03/2019	ET HL	13:00	13:30	11	11	2	1							0						0						0						0
				9	27/03/2019	ET HL	13:00	13:30	11	11	2	1							0						0						0						0
				10	28/03/2019	ET HL	13:00	13:30	11		2	1	ny continuing on from a weekend of sunshine						0						0						0						0
				11	01/04/2019	JW SD	16:00	16:50	13	13	0	1							0		2			2	4						0						0
				12	10/04/2019	JDD BC	13:00:00	13:30:00	10	11	2	3							0			1			1						0						0
				13	11/04/2019	JDD BC	12:15	12:45	9	10	2	1							0						0						0						0
				14	15/04/2019	JDD JA	16:50:00	17:00:00	12	12	3	3							0						0						0						0
				15	23/04/2019	MC TW	15:30	16:00	19	19	8	0							0	1		2			3						0						0
				16	25/04/2019	MC TW	15:50	16:15	14		4	1	Showers/sunny spells						0						0						0						0
				17	30/04/2019	JD JDD	09:30	10:10	11	12	2	2							0					1	1						0						0
				18	01/05/2019	JD JDD	12:10	12:46	14	14	5	2							0		2		1		3						0						0
				19	07/05/2019	DL JDD	17:10:00	17:30:00	12	11	6	2							0						0						0						0
				20	16/05/2019	RW SB	09:05	09:20	12	12	1	2							0						0						0						0
45		**0.69**	**311 - Crickley hill**	**Total Catch**										**1**	**2**	**3**	**5**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**2**
				1	12/09/2018	RC MC	10:30:00	11:00:00	14	14	7	2					1		1						0						0						0
				2	14/09/2018	RC MC	10:00:00	10:30:00	16	16							1		1						0						0						0
				3	18/09/2018	RC MC	10:00:00	10:20:00	17	17		3					1		1						0						0						0
				4	20/09/2018	RC MC	14:30:00	15:00:00	17	17	7	6		1					1						0						0						0
				5	24/09/2018	RC MC	14:10:00	15:00:00	14	14	4	2							0						0						0						0
				6	02/10/2018	RW RC	11:30:00	11:50:00	15	16	8	3							0						0						0						0
				7	04/10/2018	RW RC	13:00:00	13:24:00	15	15	4	3							0						0						0						0
				8	30/04/2019	JD JDD	14:02:00	14:20:00	13	13	7	2			1				1						0						0						0
				9	02/05/2019	RW BG	10:00:00	10:10:00	11	11	5	1							0						0						0						0
				10	08/05/2019	RW PN	13:00:00	13:15:00	12	12	5	2							0						0						0						0
				11	16/05/2019	NB DL	09:40	09:54	14	14	10	1							0						0						0						0
				12	21/05/2019	DB RM	14:00:00	14:30:00	14	14	1	1							0						0						0						0
				13	30/05/2019	NB CD	15:30	15:45	18	18	4	2					1		1						0						0					1	1
				14	12/06/2019	JD JC	14:41	15:01	11	12	7	1			1				1						0						0			1			1
				15	17/06/2019	JDD WG	16:00:00	16:20:00	16	16	7	2				1			1						0						0						0
				16	20/06/2019	MC TW	14:00	14:10	15	15	7	3							0						0						0						0
				17	26/06/2019	DL JC	13:30	13:40	19		6	2				1			1						0						0						0
				18	27/06/2019	LF JC	10:57	11:09:00	16	16	0	0				1			1						0						0						0

				19	02/07/2019	RW KG	12:00	12:15	16	16	6						1		1						0						0						0
				20	03/07/2019	RW KG	10:15	10:30	17	17	3	1							0						0						0						0
46 (A6)	05/04/2019	0.56	9 - Hot Air balloo	**Total Catch**										**8**	**7**	**14**	**19**	**0**	**48**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
				0	12/09/2018	JD JDD	10:06	10:20	12	12	7	1					1		1						0						0						0
				2	14/09/2018	JD JDD	09:45	10:10	14	16	7	2							0						0						0						0
				3	20/09/2018	JD Mush	12:52	13:18	15	15	7	3							0						0						0						0
				4	25/09/2018	RW ET	13:00	13:30	15	15	1	3							0						0						0						0
				5	27/09/2018	RW ET	09:00	09:20	11	12	0	1							0						0						0						0
				6	02/10/2018	RW ET	14:25	14:33	13	13	2	3							0						0						0						0
				7	04/10/2018	RW ET	12:00	12:35	14	14	2	2		1					1						0						0						0
				8	09/10/2018	RC WG	12:17	12:44	14	14	1	1							0	1					1						0						0
				9	18/10/2018	RW	13:45:00	14:00:00	12	12	7	1							0						0						0						0
				10	29/04/2019	JD	14:00	14:10	13	13	3	2			1				1						0						0						0
				11	30/04/2019	JD JDD	15:00	15:10	15	15	3	3					1		1						0						0						0
				12	01/05/2019	RW BG	10:45:00	11:15:00	14	14	3	2			1	1	3		5						0						0						0
				13	08/05/2019	DL JDD	12:55:00	13:05:00	12	12	6	2				2	2		4						0						0						0
				14	14/05/2019	RW SB	12:35	12:50	17	17	1	2				1	1		2						0						0						0
				15	16/05/2019	NB DL	09:54	10:05	14	14	10	1		2			3		5						0						0						0
				16	21/05/2019	DBl RM	15:15:00	16:00:00	18	18	2	1							0						0						0						0
				17	30/05/2019	JD DL	11:27:00	12:00:00	17	17	7	3		3	1	1	2		7						0						0						0
				18	12/06/2019	CD DL	15:25	15:45	13	13	6	2				4	4		8						0						0						0
				19	20/06/2019	TW MC	13:30	13:50	15	15	7	3		1	3	3	2		9						0						0						0
				20	27/06/2019	DL RW	11:10	11:30	18	18	0	2		1	1	2			4						0						0						0
47 (A9)		0.61	GR354765 - Iddle	**Total Catch**										**17**	**14**	**25**	**45**	**0**	**101**	**13**	**16**	**12**	**13**	**23**	**77**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
				1	12/09/2018	JD MEH	15:10	15:30	17	17	5	1		9					9	3	2		1		6						0						0
				2	14/09/2018	JD JDD	11:20	11:55	15	17	7	2				1	1		2	3	1				4						0						0
				3	18/09/2018	HW MA	14:10:00	14:30:00	18	17	8	4							0	1				5	6						0						0
				4	25/09/2018	RW ET	11:50:00	12:30:00	15	15	1	3							0					1	1						0						0
				5	27/09/2018	RW ET	10:00:00	10:30:00	15	17	0	1							0						0						0						0
				6	02/10/2018	RW ET	14:05	14:20	12	12		3					1		1						0						0						0
				7	04/10/2018	RW ET	11:45	12:00	15	15	4	3							0						0						0						0
				8	09/10/2018	RC WG	13:00	13:20	15	15	1	1							0						0						0						0
				9	18/10/2018	RW	13:30	13:45	12	12	6	2							0						0						0						0
				10	11/03/2019	CD JC	14:40	15:20	12	12	2	0					1		1						0						0						0
				11	18/04/2019	CD BC	14:40	15:20	14	14	2	0				1	2		3						0						0						0
				12	01/05/2019	RW BG	12:20:00	11:30:00	14	14	5	2		1		1	2		4	3	1	2		2	8						0						0
				13	02/05/2019	RW BG	11:00:00	11:40:00	11	11	5	3			3	1	1		5						0						0						0
				14	08/05/2019	DL JDD	12:30	12:50:00	11	11	7	2				2	1		3				1		1						0						0
				15	15/05/2019	NB DL	10:45	11:30	15	15	0	3	ny, south-west facing so refugia not too hot		1	4	3		8		6	1	1	2	10						0						0
				16	14/05/2019	RW SB	11:55	12:30	17	17	1	3							0		1			2	3						0						0
				17	16/05/2019	NB DL	10:10	11:00	16	16	10	1					3		3				2		2						0						0
				18	21/05/2019	DBl RM	16:15:00	17:00:00	18	18	2	1			1		1		2		1				1						0						0
				19	30/05/2019	JD DL	11:45:00	12:30:00	17	17	6	3		1	9	6	8		24	3	3	3	3	4	16						0						0
				20	31/05/2019	NB DL CD BC	09:30	10:15	14	14	5	2		6		9	21		36		1	6	5	7	19						0						0
48		0.5	GR376605	**Total Catch**										**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
				1	12/09/2018	JW JDD	10:00	11:00	16	16	7	1							0						0						0						0
				2	14/09/2018	RW ET	10:00	10:30	16	16	7	2							0						0						0						0
				3	17/09/2018	MA HW	13:20	13:45	18	18	8	4							0						0						0						0
				4	20/09/2018	CD RC	13:00	13:20	17	17	8	4							0						0						0						0
				5	25/09/2018	JW JD	12:00	12:30	15	16	0	1							0						0						0						0
				6	27/09/2018	RW ET	09:35:00	09:55:00	12	12	0	1							0						0						0						0
				7	02/10/2018	ET MW	14:05	14:20	12	12	8	3					1		1						0						0						0
				8	04/10/2018	ET MW	12:00:00	12:15:00	15	15	4	3							0						0						0						0
				9	18/10/2018	RW LF	15:00	15:15	13	13	6	2							0						0						0						0
				10	26/02/2019	DL GC	15:30:00	15:45:00	17	17	0	2	whole day, tiles in the sun from midday onwards						0						0						0						0
				11	28/03/2019	ET HL							No proforma. No reptiles seen						0						0						0						0
				12	17/04/2019	JDD JA	12:20	12:40	12	12	8	2							0						0						0						0
				13	26/04/2019	MC TW	09:10	09:25	12	12	3	1							0						0						0						0
				14	29/04/2019	JD JDD	13:45:00	13:50:00	15	15	3	2							0						0						0						0
				15	30/04/2019	JD JDD	13:50	14:00	13	13	4	2							0						0						0						0
				16	01/05/2019	RW BG	12:30	12:42	14	14	6	2							0						0						0						0
				17															0						0						0						0
				18															0						0						0						0
				19															0						0						0						0
				20															0						0						0						0
49 (A7)		0.19	98 Bund next to	**Total Catch**										**0**	**0**	**14**	**7**	**0**	**21**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**
				1	18/03/2019	ET HL	13:00	13:30	11	11	2	1							0						0						0						0
				2	28/03/2019	ET HL	15:00	15:45	13	13	0	1							0						0						0						0
				3	01/04/2019	JW SB	12:45	13:21	9	10	0	0							0						0						0						0
				4	10/04/2019	JDD BC	16:00	16:00	11	11	3	0							0						0						0						0
				5	11/04/2019	JDD BC	09:30	10:00	9	9	1	3							0						0						0						0
				6	12/04/2019	JDD BC	17:00:00	17:24:00	10	10	8	1							0						0						0						0
				7	16/04/2019	JDD JA	15:20	15:30	13	13	3	0							0						0						0						0
				8	25/04/2019	MC TW	16:45:00	17:30:00	14	14	5	3				1			1						0						0						0
				9	29/04/2019	JDD JD	12:05	12:20	11	11	4	3				1	1		2						0						0						0
				10	30/04/2019	JDD JD	14:55:00	15:20:00	10	10	6	2					1		1						0						0						0
				11	02/05/2019	JD JDD	15:00	15:45	13	13	0	1							0						0						0						0
				12	07/05/2019	DL JDD	11:35	11:45	11	11	6	1				1			1						0						0						0
				13	10/05/2019	JDD RW	10:20	10:30	17	17	0	2				1			1						0						0						0
				14	21/05/2019	DBl RM	15:30:00	16:00:00	18	18	2	1					1		1						0						0						0
				15	26/06/2019	RW LF	13:50	14:20	17	17	8	3				4	2		6						0						0						0
				16	27/06/2019	LF JC	11:47	11:57	19	19	0	2				2	1		3						0						0						0
				17	28/06/2019	LF JC	10:39	10:49	17	17	0	3				2	1		3						0	1					1						0
				18	02/07/2019	GG LF	10:39	10:49	17	17	0	3				2			2						0	1					1						0
				19	3/7/19 (early)	GG LF	08:15	08:45:00	15	15	2	1							0						0	1					1						0
				20	3/7/19 (late)	GG LF	12:30	13:00:00	19	19	2	1							0						0						0						0
				Total Catch										**12**	**4**	**21**	**39**	**14**	**90**	**0**	**0**	**9**	**3**	**13**	**25**	**0**	**0**	**1**	**5**	**9**	**15**	**2**	**0**	**0**	**0**	**0**	**3**
				1	30/03/2019	J. Weston												5	5					5	5					3	3						0
				2	01/04/2019	J. Weston												5	5					5	5						0						0
				3	06/04/2019	J. Weston										3	2		5			2			2						0						0

				4	07/04/2019	J. Weston													0						0					5	5						0
				5	17/04/2019	J. Weston										1	1		2			1			1						0						0
				6	21/04/2019	J. Weston													0					1	1						0						0
				7	04/05/2019	J. Weston								2		2	3		7			3			3						0						0
				8	02/06/2019	J. Weston										1	4	4	9			1			1						0						0
				9	09/06/2019	J. Weston								3		2	10		15				1		1					1	1	1						1
ARG	James Weston	5.21	Crickley Hill Scarp	10	16/06/2019	J. Weston								7		7	14		28			2	2		4				1		1	1					1
				11	06/07/2019	J. Weston										3	1		4					2	2			1	2		3						1
				12	20/07/2019	J. Weston									4	2	4		10						0				2		2						0
				13															0						0						0						0
				14															0						0						0						0
				15															0						0						0						0
				16															0						0						0						0
				17															0						0						0						0
				18															0						0						0						0
				19															0						0						0						0
				20															0						0						0						0