

OTTERPOOL PARK

Environmental Statement (ES) Appendix 7.6: Reptile Survey Report – Update to Include 2020 and 2021 Survey Data

MARCH 2022

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Executive Summary

Arcadis Consulting (UK) Limited has been commissioned on behalf of Otterpool Park LLP to undertake a survey for reptile species to inform an EIA for the proposed Development and accompany an amended outline planning application. The proposed Development is 'Otterpool Park', a Garden settlement located within Kent. The development area has been identified as an 'area of search'; hereafter, the area of search is referred to as "the site".

The site is located within Folkestone, Kent within the administrative boundary of Folkestone and Hythe District Council (F&HDC) and spans a large area located immediately south of Junction 11 of the M20. The site is largely agricultural in nature with the majority of the site comprising arable and pasture fields, a disused horseracing course with an artificial lake ('Folkestone Racecourse Lake'), areas modified from historical use (airfields), existing historic settlements and relatively new industrial areas. The site area encompasses the proposed Otterpool Park Area Development application site, which is approximately 589 ha.

During the initial Phase 1 habitat surveys conducted in October 2016, a range of habitats with the potential to support common reptiles were identified. A desk study returned multiple records of common reptiles from within the vicinity of the site. No suitability to support sand lizard or smooth snake was recorded, and the desk study did not return records of these species. The habitats on site were assessed as having sub-optimal suitability for adder, but good suitability for slow-worm, common lizard and grass snake.

Dedicated reptile surveys were undertaken across the site in 2017 by Arcadis and CSa Environmental and again in 2021 by Arcadis in targeted areas.

The survey area in 2017 covered potentially suitable habitat within the site boundary with exception of land where access was not permitted or surveying was not practicable or would expose reptile populations to increased risk of persecution.

The 2021 survey covered areas where it was assessed that the reptile population may have changed (areas which had recently been created for reptiles (such as a receptor site in the south of the Study Area) and areas where management was modified.

The methodology for the reptile surveys of the selected sites was based upon guidance within the following documents:

- Sewell *et al.* (2013) Survey protocols for the British herpetofauna; and
- Froglife (1999) Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

Felt refugia (1m x 1m, 1m x 0.5m and 0.5m X 0.5m) were distributed throughout the site where habitat was suitable, accessible and appropriate for survey. In 2017, ten checks were undertaken subsequently to determine presence/absence of reptiles within the application site boundary, under suitable weather conditions (with the exception of one area where seven checks were undertaken due to access constraints). This involved carefully lifting each refugia and recording any reptiles sheltering underneath before replacing the mat in its original position. Incidental reptile sightings were also recorded. In 2021, seven checks were conducted at each survey area.

During the 2017 and 2021 field surveys three common reptile species were recorded, common lizard, grass snake and slow-worm. In 2017, over 500 individual records of reptiles were recorded across the site; in 2021, over 600 individual records of reptiles were recorded in the targeted areas.

The results of the 2017 and 2021 surveys suggested that no area of the site supported a particularly high population of grass snake, with peak counts in all areas not exceeding five adults (a good population). Distribution across the site was widespread but at low density. The site overall is likely to be of local importance for grass snake. However, this species appears to be in 'general decline' nationally (Humphreys *et al.*, 2011),

The distribution of slow-worm across the site was much more variable, with the majority of the survey areas not supporting this species, good populations being present in a number of areas where this

species was present and one area supporting an exceptional population (field near to the M20 roundabout in the northeast). The site overall is unlikely to have value above local value for this species. However, small, distinct areas of the site are likely to be of particular value, being of local value in themselves. This species appears to be in 'general decline' nationally (Humphreys et al., 2011),

Common lizard was widely distributed across the site, with most survey areas supporting this species, but also a few key areas where populations were higher and a 'good' or 'exceptional' population was supported (largely around the previous reptile receptor site in proximity to the airfield to be retained). Overall, the site is likely to be of local importance for this species, considering the widespread distribution across Kent. However, as with slow-worm, a few areas of the site did support 'exceptional' populations. This species appears to be in 'general decline' nationally (Humphreys et al., 2011). In total, the site supports 63.66 ha of suitable habitat for common reptile species.

Some changes in populations were observed between the 2017 and 2021 surveys. The reptile population associated with area F/T (the racecourse area) had changed in that the populations of both common lizard and grass snake had increased from 'good' to 'exceptional'. This is assessed to be a result of the reduced usage of this area which has led to some areas becoming more densely vegetated. The population of reptiles associated with area I/U (an old compound area by the A20) had also increased, with the populations of both slow worm and common lizard going from a good population to an exceptional population. It is considered that this is likely due to the populations increasing to fill the carrying capacity of this relatively recently created habitat. The population of reptiles associated with area L/V (Otterpool Quarry SSSI) was largely the same as when previously surveyed in 2017, with only the population of common lizard changing, the population reducing to low from good. This is likely due to modified grazing regime in this area. The population of reptiles associated with area O/P/W (the Lympe Airfield area) was largely the same, except for common lizard, whose population had increased from 'good' to 'exceptional'. This is likely due to the population increased after the translocation to the carrying capacity of the created site.

To mitigate potential impacts to reptiles from the proposed Development, within the development, there will be embedded design measures to ensure that reptiles can utilise areas of the site and move through the site. This will include buffers of rough grassland around retained habitat features including hedgerows and between retained areas of habitats. In addition, SuDS areas, where appropriate, will be designed to provide reptile habitats with the provision of rough grassland and hibernacula.

Elsewhere within the site, areas designed specifically to provide habitat for reptiles will be created, including a large area (approximately 15ha) in the north west of the site, which will be a specific nature area, and will include specific enhancement for reptiles, including a mosaic of species rich grassland and scrub, hibernacula and water bodies.

During components of the development, it is likely that displacement and translocation actions will need to be undertaken to ensure that individual reptiles and populations of reptiles are safeguarded during the works. This is likely to include:

- Habitat manipulation to displace reptiles into retained habitats adjacent to habitats to be removed;
- Manual capture and translocation of reptiles from areas to be lost into retained / enhanced habitats.

It is likely that there will need to be a suite of enhancement measures developed to ensure that areas identified for reptile translocation will be done so well in advance of the translocation commencing. It is also likely that a suite of monitoring and maintenance works will be required in relation to the proposed Development when in operation.

1 Introduction

1.1 Overview

1.1.1 Arcadis Consulting (UK) Limited has been commissioned on behalf of Otterpool Park LLP to undertake a survey for reptile species to inform an EIA for the proposed Development and accompany an outline planning application. The proposed Development is ‘Otterpool Park’, a garden settlement located within Kent. The development area has been identified as an ‘area of search’; hereafter, the area of search is referred to as “the site”. This report presents the results of reptile surveys conducted in 2017 and 2021.

1.2 Site Location and Setting

1.2.1 The site is located within Folkestone, Kent within the administrative boundary of Folkestone and Hythe District Council (F&HDC) and spans a large area located immediately south of Junction 11 of the M20. The site is largely agricultural in nature with the majority of the site comprising arable and pasture fields, a disused horseracing course with an artificial lake (‘Folkestone Racecourse Lake’), areas modified from historical use (airfields), existing historic settlements and relatively new industrial areas.

1.2.2 The M20 motorway, Channel Tunnel Rail Link and Westenhanger Station are located to the north of the site, beyond which lie the villages of Stanford and Postling within a largely rural setting including the Kent Downs Area of Outstanding Natural Beauty (AONB). This AONB extends to the east, beyond which lies the town of Hythe, and to the south where it includes Lympne village. The site also includes the settlements of Barrowhill, Sellindge, Westenhanger and Newingreen. Lympne Industrial Park and some areas of woodland are located immediately south of the site. In addition, East Stour River flows through the site in a north-east to west direction. The site is centred on BNG TR 111 363.

1.2.3 An aerial image illustrating the site is presented in Image 1. Photographs of the site are presented in in Appendix D - Photographs.



Image 1: Aerial imagery of the site.

1.3 Proposed Development

- 1.3.1 The proposed Otterpool Park Area Development is located on 589 ha of land within the wider study area as shown in Figure 1. The planning application seeks permission for a new garden settlement accommodating up to 8,500 homes (Use Classes C2 and C3) and Use Class E, F, B2, C1, Sui Generis development, including use of retained buildings as identified, with related infrastructure, highway works, green and blue infrastructure, with access, appearance, landscaping, layout and scale matters to be reserved. A summary of the maximum floorspace areas for each land use type is provided in Chapter 4: The Site and the Proposed Development of the ES.

1.4 Purpose of the Reptile Surveys

- 1.4.1 The purpose of the reptile surveys were to:
- Identify areas of the site which supported habitats suitable for reptiles;
 - Determine the distribution of reptiles across the site;
 - Estimate the population density of reptiles across the site;
 - Inform an impact assessment based upon the survey results and the proposed scheme;
 - Inform avoidance, mitigation, conservation and enhancement for reptiles within the masterplan and subsequent developments; and
 - Inform the need for further surveying (if required).

1.5 Reptile Biology

- 1.5.1 There are six native UK reptiles species, namely;
- Grass snake (*Natrix natrix*);
 - Common lizard (*Zootoca vivipara*);
 - Slow-worm (*Anguis Fragilis*);
 - Adder (*Vipera berus*);
 - Smooth snake (*Coronella austriaca*); and
 - Sand lizard (*Lacerta agilis*).
- 1.5.2 All of these species have suffered a decline in their populations due to habitat loss and fragmentation from agricultural intensification and urbanisation. Reptiles are particularly sensitive to habitat loss due to their complex habitat requirements for their various behaviours (basking, breeding, foraging, shelter from predation and hibernation). Most require a mosaic of grassland, open areas and light scrub as a minimum standard and some (such as the sand lizard) have much more particular habitat requirements, which are uncommon in the UK today. Due to their exothermic (cold blooded) nature, reptiles tend to be concentrated in the south of the country, but the more common species are distributed throughout the UK. Those with widespread abundance and distribution are afforded lower levels of legal protection whereas the rarer species with concentrated distribution such as the smooth snake and sand lizard are classified as European Protected Species (EPS) and are afforded the highest level of protection under the Wildlife and Countryside Act 1981 (as amended) (HMSO, 1981) and the Conservation of Habitats and Species Regulations 2017 (HMSO, 2017).
- 1.5.3 The site does not support habitat for rare reptiles (smooth snake and sand lizard). Below is a brief summary of each of the six species distribution, habitat choice and lifestyle.

Snakes

Adder

- 1.5.4 Adder are distributed throughout the UK but are absent in Ireland. They hibernate from October to March (temperature dependant) their diet usually consists of smaller reptiles such as lizards; amphibians and rodents. Adder can be found in a wide variety of habitats but their main habitat preferences are areas of open land where prey are more abundant such as moors and grassland. They do not breed regularly and can go as long as three years before re-producing if climate conditions are unsuitable. The adder is venomous but tend to use camouflage more as a method to avoid harm/predation. Adder have not been found on site.

Grass snake

- 1.5.5 Grass snake are found in the southern regions of the UK. They hibernate from October to March and prefer damp habitat areas such as watercourses and marshes and their surrounding habitat. This is due to the availability of their amphibian prey. Female grass snake reproduce every other year, eggs are laid in June/July. Grass snake are not venomous but do excrete a foul smelling substance if handled. Suitable habitat for grass snake is present across the site.

Smooth snake

- 1.5.6 Smooth snakes are the rarest native British snake with their range mostly confined to the south east of Dorset, Hampshire and east Surrey. This is in part due to the fact that they predominantly feed on other reptiles, so are concentrated in the south of the country for the greater availability of prey. They prefer heathland habitats but will also be found in areas of grassland although much of their time is spent underground so they are rarely seen. Much like the grass snake, the smooth snake hibernates from October-March and reproduce every other year, although live young contained within a membrane are born as opposed to eggs. In terms of conservation, smooth snakes have been found to be unsuitable for captive breeding programmes so correct habitat management is vital for areas where their presence is confirmed.
- 1.5.7 Habitat for the smooth snake is not present within the site.

Lizards

Common lizard

- 1.5.8 Common lizard are distributed throughout the UK. They can be found in a variety of different habitats including woodland, heathland, grassland, banks and ditches. They hibernate between October to March, usually within the crevices of log piles or rubble. During the summer months, they spend time basking in the sun to gain energy for foraging, preying on small invertebrate prey such as snails and earthworms. Lizards are ovi-viviparous, fertilised eggs are not laid until the young is almost fully developed, whereby they are born within an egg sack that usually bursts during childbirth. Despite being one of the most common British reptiles, numbers are in decline due to habitat loss and fragmentation. By encouraging the development of a varied landscape and reducing the amount of intense management of public and private greenspace, it is likely that the lizard population will benefit. Suitable habitat for common lizard is present across the site.

Sand lizard

- 1.5.9 The sand Lizard is the rarest of all six reptile species, this is due to their niche habitat choice of dry or sandy heathland which is rare in Britain and has become increasingly rarer due to human influence in the past century. For this reason they are classified as a European Protected Species and are therefore afforded the highest level of protection under the Wildlife and Countryside Act 1981 (as amended) (HMSO, 1981). Much like the common lizard, they prey on small invertebrates and their hibernation is from October to March, within piles of

rubble or deadwood. Females lay eggs in June/July, within a sandy burrow, which hatch in August/September.

1.5.10 Habitat for the Sand lizard is not present within the Otterpool site.

Slow-worm

1.5.11 Slow-worm are widely distributed throughout the UK but spend a large proportion of their time underground. Habitat preferences include embankments, allotments, rough grassland and wasteland. Like all UK reptiles they hibernate from October to March and young are produced in August to September. This species is also ovi-viviparous, much like the common lizard.

1.6 Legislation and Conservation Status

Legislation

- 1.6.1 The smooth snake and the sand lizard are protected under national and European legislation. Both are classified as European Protected Species. This means they are afforded full protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (HMSO, 1981) which makes it an offence to:
- Intentionally (or recklessly) disturb a smooth snake/ sand lizard whilst it is occupying a structure or place which it uses for shelter or protection;
 - Intentionally or (or recklessly) obstruct access to any structure or place used for shelter or protection by a smooth snake/ sand lizard; and
 - Sell, offer or expose for sale, or to possess or transport for sale alive or dead smooth snake/ sand lizard or any part of or anything derived from a smooth snake/ sand lizard.
- 1.6.2 The term “recklessly” was added as an amendment to the Wildlife and Countryside Act 1981 (as amended) (HMSO, 1981) as a result of the Countryside and Rights of Way Act 2000 (HMSO, 2000).
- 1.6.3 They are also included on Schedule 2 of Conservation of Habitats and Species Regulations 2017 (HMSO, 2017) which makes it an offence to:
- Deliberately capture or kill a smooth snake/ sand lizard;
 - Deliberately disturb a smooth snake/ sand lizard (where disturbance is likely to impair their ability to survive, breed or reproduce, rear or nurture their young; or to hibernate or migrate; or to affect significantly the local distribution or abundance of otters).
 - Damage or destroy a breeding site or resting place of a smooth snake/ sand lizard; and
 - Be in possession of, control, transport, sell or exchange, or offer for sale or exchange any live or dead wild smooth snake/sand lizard or any part of a wild smooth snake/ sand lizard or anything derived from a wild smooth snake/ sand lizard or any part of a wild smooth snake/ sand lizard.
- 1.6.4 Licences may be granted by Natural England under Regulation 53 of Conservation of Habitats and Species Regulations 2017 (HMSO, 2017) for certain purposes affecting otters, including development works. Regulation 53 (2)(e) states that such licences can be granted for the purpose of “preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment”. Those activities listed under Schedule 2 (see above) would not constitute an offence if carried out in accordance with the terms of such a licence.
- 1.6.5 All other UK reptiles are protected by national legislation only. They are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (HMSO, 1981) which makes it an offence to:
- Intentionally (or recklessly) kill, injure or take them; and
 - Sell, offer or expose for sale, or to possess or transport them for sale live or dead or any part of them or anything derived from them.

1.6.6 There is no licensing mechanism in place that permits development activities to proceed, which would otherwise result in the contravention of the Wildlife and Countryside Act 1981 (as amended) (HMSO, 1981). Where development activities would result in an offence being committed under the Act, it may be considered necessary to capture and remove the animals from the affected area and translocate them to a new receptor site.

Conservation status

1.6.7 The four common species are widespread but declining (Humphreys *et al.*, 2011). They are all UK Biodiversity Action Plan (BAP) Priority Species now included on Section 41 of the Natural Environment and Rural Communities Act 2006 (HMSO, 2006). All but smooth snake are also Kent BAP Priority Species (Table 1).

Table 1: Population and nature conservation status of reptiles in the UK and Kent

Species	Distribution	Status	UK BAP Priority Status	Kent BAP Priority Status
Adder	Widespread, but restricted by habitat preferences	Declines in some areas	England, Scotland and Wales	Yes
Common lizard	Widespread, but patchy	General decline	England, Scotland and Wales	Yes
Grass snake	Widespread in England and Wales. Almost absent from Scotland except for introductions.	General decline but current trends unknown	England, Scotland and Wales	Yes
Sand lizard	Localised	Documented decline	England, Scotland and Wales	Yes
Slow-worm	Widespread	General decline	England, Scotland and Wales	Yes
Smooth snake	Localised, Dorset, Surrey and Hampshire heaths	Decline, but current trends largely unknown	England	No

2 Approach and Methodology

2.1 Habitat Assessment

2.1.1 In order to scope and design appropriate surveys, a site walkover was conducted in October 2016 by Arcadis ecologists Guy Stone (Associate Technical Director) and Brandon Murray (Principal Ecologist). During this exercise, habitats with suitability for reptiles were identified and mapped. Habitat surveys have been updated over the intervening years with the latest habitat survey updates having been undertaken in 2020 with reptile survey updates in 2021.

2.2 Desk Study

2.2.1 The purpose of the desk study is to review existing information available in the public domain and from biological data recorders and holders. Initially, information from a desk study requested in May 2016 was utilised to inform the surveys, with an updated information request for reptiles records within a 2km radius of the site from Kent and Medway Biological Records Centre obtained in March 2018 and then again in April 2020.

2.2.2 Desk study information was also collected from a number of sources, including ecological appraisals from previous planning applications on site and protected species information from Kent and Medway Biological record centre. Data sources included:

- Aerial photography (e.g. Google Earth mapping);
- White Young Green (WYG) (2016) Shepway District Council, Folkestone Kent, Extended Phase 1 Habitat Survey Ecology Report;
- Highways England (2016) M20 Lorry Area Stanford West Interim Environmental Assessment Report;
- Ecotricity (2012) Harringe Brooks Wind Park Environmental Statement;
- Peter Brett Associates LLP (2015) Link Park Phase 2 Supplementary Environmental Statement Non Technical Summary;
- CSa Environmental Planning (2013) Ecological Appraisal – Lymgne, Former Lymgne Airfield – Proposed Housing Development;
- Ecology Solutions Ltd (2014) Ecological Assessment, Land at Sellindge, Kent; and
- NBN Atlas Partnership (undated) NBN Atlas: <https://nbnatlas.org/>

2.2.3 Results are presented and discussed in Section 3 and Table 4.

2.3 Field Survey

Overview

2.3.1 The initial reptile surveys on the site were conducted in 2017 by Arcadis and CSa Environmental (CSa), followed by further reptile surveys in 2021 by Arcadis. Surveys were already proposed for an area in the south of the site in 2017 by CSa, and it was determined that results from these surveys could be utilised for the Otterpool Park development, without the need for additional Arcadis surveys. This also eliminated the possibility that two surveys could interfere with the veracity of the results. Data from the CSa surveys were therefore used within the Arcadis assessment. Survey methodologies were comparable between the area surveyed in 2017 by Arcadis and by CSa so the data is combined within this report. The data from the 2021 surveys are presented separately within this report. Due to the size of the site, the site was split into 'areas' based upon the habitats and connectivity between these parts of the site. Within this report, the areas referred to are presented in Figure 6 and, for 2017 and 2021 surveys respectively. For clarity, an excerpt of Figure 6 and is presented in Image 2 and Image 3 below. Within this report, population sizes are estimated for 'areas' not the entire site.

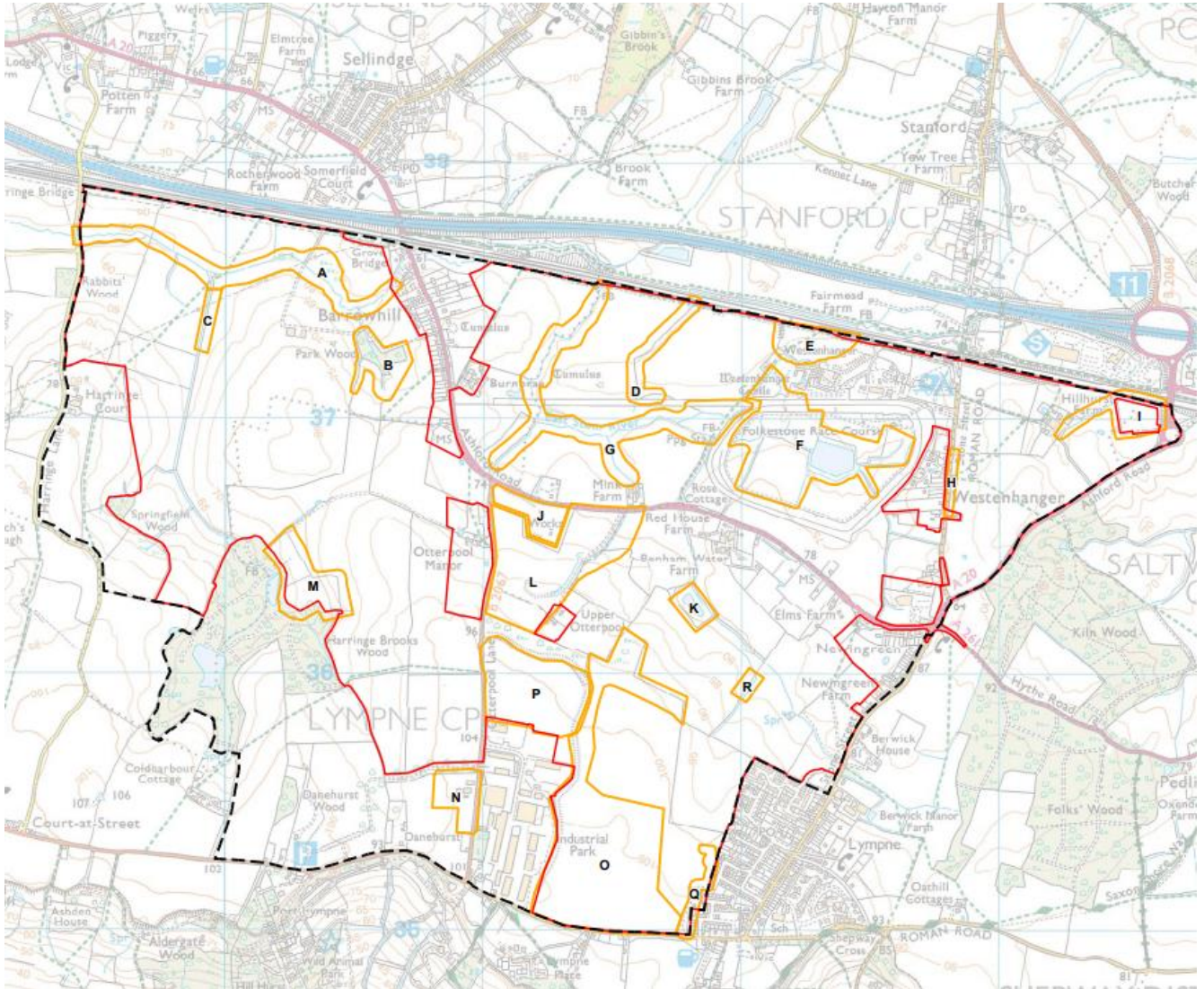


Image 2: Excerpt from Figure 6 showing the 2017 survey areas.

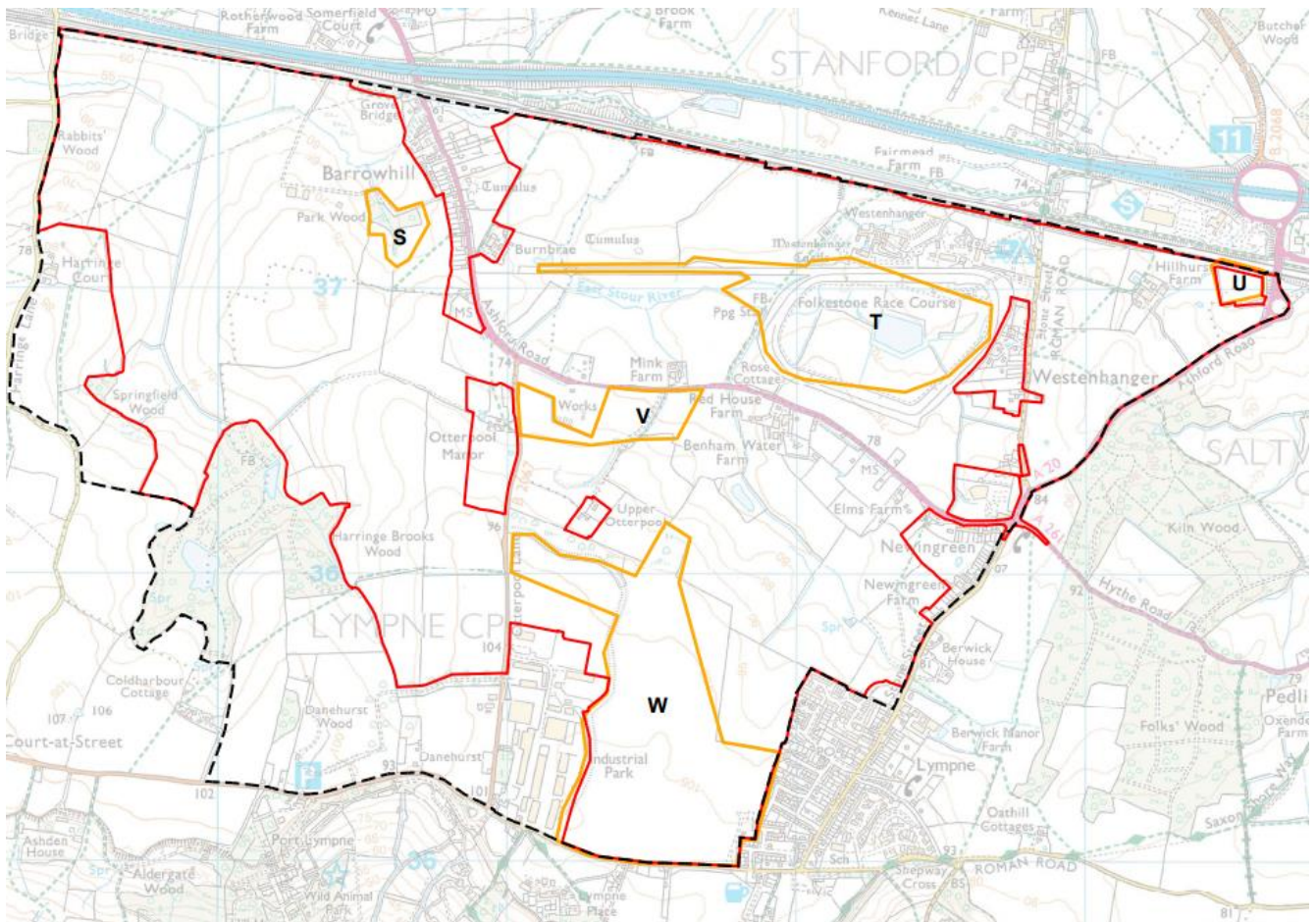


Image 3: Excerpt from Figure 17 showing the 2021 survey areas

Arcadis Surveys 2017

- 2.3.2 Dedicated reptile surveys were undertaken by Brandon Murray MCIEEM, Ewan Gibson (Assistant Ecologist GradCIEEM), Ellen Poppleton (Assistant Ecologist GradCIEEM); Hannah Tracey (Ecologist, MCIEEM) and Alex Ward (Environmental Consultant, Affiliate IEMA) in May, June, August and September 2017.
- 2.3.3 The survey area covered potentially suitable reptile habitat within the application site boundary with exception of land where access was not permitted or surveying was not practicable or would expose reptile populations to increased risk of persecution (see section 2.5 on limitations). This survey area is presented in Figure 1.
- 2.3.4 The methodology used for the reptile surveys of the selected sites was based upon guidance within the following documents:
- Sewell *et al.* (2013) Survey protocols for the British herpetofauna; and
 - Froglife (1999) Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.
- 2.3.5 Suitable habitat areas were mapped prior to the reptile surveys based on previous Phase 1 surveys undertaken on 4th, 5th and 6th October 2016 by Arcadis ecologists Guy Stone MCIEEM and Brandon Murray MCIEEM. Felt mats 'refugia' (1m x 0.5m and 0.5m X 0.5m) were distributed throughout the site where habitat was suitable, accessible and appropriate for survey, at a density in excess of 10 refugia per hectare of suitable habitat. This took place

on the 27 April to the 1 May 2017. These refugia increase the likelihood of observing reptiles as their heat retaining properties are suitable for reptile basking and sheltering.

- 2.3.6 The locations of ‘arrays’ of reptile refugia are presented in Figure 1. These arrays were grouped into survey areas for reporting, identified with letter codes A – R. These survey areas are presented in Figure 6.
- 2.3.7 Ten checks were undertaken subsequently to determine presence/absence of reptiles, under suitable weather conditions (when the temperature is neither too hot or too cold for reptile basking). This involved carefully lifting each mat and recording any reptiles sheltering underneath before replacing the mat in its original position. When walking between refugia, areas suitable for reptiles were also visually inspected. Incidental reptile sightings were also recorded. The order that refugia were checked and the time of day of the reptile checks was varied between the surveys.
- 2.3.8 Due to the size of the survey area, it was not always possible to check every refugia within the site in a single visit, due to changing weather conditions and access issues. Where this was the case, a check was split between multiple days, in suitable weather conditions.
- 2.3.9 These surveys were completed on the following days:
- 17 – 19, 22 May 2017
 - 1 – 2 June 2017
 - 8 June 2017
 - 13 and 21 June 2017
 - 31 August 2017
 - 4 – 5 September 2017
 - 6 September 2017
 - 7 - 12 September 2017
 - 25 – 26 September 2017
 - 27 – 28 September 2017
- 2.3.10 An additional area, located within a lorry park, was initially ruled out of survey due to health and safety considerations. However, safe access to this area became possible in August 2017. Reptile tiles were placed in this area on 28th August 2018. Due to the late commencement of this survey, only seven surveys were practicable, however this was deemed sufficient for the surveys to be completed.
- 2.3.11 These surveys were completed on the following days:
- 12 September 2017
 - 20 September 2017
 - 21 September 2017
 - 25 September 2017
 - 27 September 2017
 - 28 September 2017
 - 2 November 2017
- 2.3.12 The number of reptiles recorded within the lorry park area was small and it was practicable to combine these results with the other surveys conducted by Arcadis for clarity.

CSa Surveys 2017

- 2.3.13 CSa surveys were conducted between April and September 2017. Refugia placements were slightly denser than the Arcadis tile placements and varied in differing habitats, averaging approximately 20 tiles per hectare. The survey methodology was comparable to the Arcadis methodology, described above. The surveys were conducted by the following CSa staff members: Martin Sutherland, Jessica Tait, Hannah Willis, Aaron White and Alexandria Shaw.
- 2.3.14 Reptile results were mapped to survey areas within the survey. This did not allow accurate positioning of each reptile record but are sufficiently detailed to allow for reptile populations at the site scale to be estimated.

Arcadis Surveys 2021

- 2.3.15 In 2021 dedicated reptile surveys were carried out using the same methodology as the Arcadis 2017 surveys, though focussing on areas that were most likely to have changed due to habitat management and other factors. The field surveys were undertaken on behalf of Arcadis by Tim Buckland, Alex Burrows, Agnes Rutter, Alex Matthams and Shaun Pryor.
- 2.3.16 These seven checks were completed on the following days:
- 13 April 2021
 - 19 April 2021
 - 27 April 2021
 - 6 May 2021
 - 10 May 2021
 - 19 May 2021
 - 26 May 2021
- 2.3.17 The areas identified for survey in 2021 were selected as they were areas where it was assessed that there was a potential driver for change in the reptile population. These areas are identified with the letters S, T, U, V, and W. The areas were comparable to a subset of the areas surveyed in 2017, with minor modifications based upon the areas with habitat suitability and accessibility. The table below (Table 2) presents the letter identifications of the areas in 2021, with the comparable survey area in 2017, with the rationale as to why this area was scoped into the 2021 surveys.

Table 2: 2021 survey areas and comparable 2017 survey area and rationale for resurvey

2021 survey area	Comparable 2017 Survey area	Rationale for resurvey
S	B	The grassland sward around this woodland area was noted in 2021 to be denser than when surveyed in 2017, likely due to the removal of beehives and associated management for maintenance and access etc.
T	F	This area within the former Folkestone Racecourse is still being managed, but since the end of regular use of the racecourse, some areas have become more densely vegetated. Other areas are now grazed with sheep where they were previously mown (Areas of the seven furlongs racetrack).
U	I	This area has been disturbed as part of construction (it appears to be a previous compound area) and has been the location of deposition of large piles of waste rubble, which form habitat for reptiles. Since the surveys in 2017 the natural succession of the vegetation has made this area more suitable for reptiles.

2021 survey area	Comparable 2017 Survey area	Rationale for resurvey
		The updated 2022 submission redline omits the majority of survey area U / I from the site redline.
V	L	This area is largely the same as when surveyed in 2017, but appeared to have a slightly modified grazing regime.
W	O/P	This area was used for a reptile translocation in 2007, and the bunds created for landscape screening in relation to this work are becoming increasingly suitable for reptiles. The translocated population was also assessed to be likely to be expanding to fill the carrying capacity of the area.

2.3.18 Other areas of the site which were surveyed in 2017 were either field margins or along the river corridors (where the habitat and management has remained unchanged so there was no driver for change in the reptile population), now outside of the site (Area N), access was denied (Area M) or have continued under the same management for many years (areas E, J, K). It was assessed that further survey in this area was unlikely to be of value.

2.4 Assessment of Population Density Across the Site

- 2.4.1 In order to identify the status of reptiles across the site, and inform the Framework Masterplan design, an interpretation of the population density of reptiles present across the site was required. Estimating reptile population densities is difficult for reptiles due to a number of factors summarised by Froglife (1999) quoted below.
- 2.4.2 “the challenges involved in surveying them, because their ecology is not fully understood, each survey visit may only reveal a small sample of the population, and the proportion of animals available for survey varies according to weather, migration patterns, etc.”
- 2.4.3 Various methodologies were considered for estimating the population of reptiles across the site. Due to the size of the site and purpose of the surveys, estimating populations from the peak counts recorded within the surveys was determined to be an appropriate method. Multiple population density estimation matrices can be utilised. These matrices were examined and an appropriate matrix which provided an adequate level of detail for the site was identified, that utilised for ‘Key Reptile Sites Population Assessment’ (Froglife 1999). Other assessment criteria would not have allowed for the varying value of different areas of the site to be identified.
- 2.4.4 The data collected allows for the reptile population density across the site to be identified according to the Key Reptile Sites Population Assessment (Froglife 1999). The entire site was subdivided into smaller ‘areas’ based on the habitats present and the connectivity between the areas. These areas were then assessed for population density. This assessment includes the following population bandings shown in the table below (only species present on site are shown in Table 3).

Table 3: Population density bandings for reptiles from the Key Reptile Sites tool

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

- 2.4.5 Figures in the table above refer to the maximum number of adults seen by observation and/or under refugia placed at a density of up to 10 per hectare by one person in one day. Across the site, areas where reptiles were found were broken into discrete 'sites' (based on the connectivity of these areas and the habitats present). This allowed for the areas of the site with the highest value for reptiles to be identified. These sites are identified as areas A – R for the 2017 surveys and areas S – W for the 2021 surveys.
- 2.4.6 As the areas surveyed by CSa in 2017 used a greater tile density than those used by Arcadis, the results from the 2017 CSa areas were normalised using a division factor to ensure that all of the results were comparable. Across the area surveyed by CSa, the average tile density per hectare of suitable habitat was 20, therefore a division factor of 2 was utilised.

2.5 Survey Limitations

- 2.5.1 Access was limited to some areas of the site which were predominantly residential/industrial. Potentially suitable areas of habitat may be in these areas. It is considered that sufficient information on the presence of reptiles across the site has been sufficiently investigated to allow the presence of reptiles to be extrapolated across the site.
- 2.5.2 Searches were only carried out within the application site boundary and it is possible that reptiles that reside in areas neighbouring the site may use it for foraging. Potential impacts to off-site reptiles will be extrapolated from the results of the survey.
- 2.5.3 It was not always possible to cover the entire site in a single survey visit, due to varying weather conditions and access restrictions. However, discreet areas were always completed in each visit, with barriers between completed areas ensuring that 'peak counts' combined from multiple days of a single visit were still appropriate.
- 2.5.4 Some mats were disturbed during the 2017 survey period, through farm activities, interference from members of the public or being moved by wind. Where this was noted, mats were replaced the following survey, where possible, but it is possible that this disturbance may have deterred reptiles previously inhabiting the mats. In certain areas of the site, it was not practicable to place reptile refugia that had been removed or flailed due to safety concerns for the reptiles. Again, it is considered that sufficient information on the presence of reptiles across the site has been investigated to allow the presence of reptiles to be extrapolated across the site.
- 2.5.5 It should be noted that the status of the reptile population on site at the time of survey is subject to change prior to development taking place. However, the data gathered from these surveys is considered sufficient to inform the outline Framework Masterplan in terms of impact assessment and mitigation incorporated into the design of the development.
- 2.5.6 The locations of reptiles found within the 2017 CSa surveys were only recorded to a 'survey zone'. These zones varied in size but were up to 4ha in area. Recording of reptiles within these zones in the associated maps within this document is indicative only. Despite this, the accuracy provided by the CSa surveys is sufficient for the purposes of this document and this is not considered a significant limitation.
- 2.5.7 Due to the outbreak of the COVID-19 virus, survey scope was greatly impacted and had to be altered to what was safe and practical to achieve. As such, the surveys endeavoured to collect the information intrinsic to ensuring the submission is founded on robust survey data, whilst acknowledging that the surveys needed to be proportionate in light of the additional risks to Arcadis employees and members of the public. As a result, the following changes were made to the scope of all of the ecology surveys conducted in 2020 and 2021:
- For the update surveys, access was not requested to parcels of land where members of the public were likely to be at increased risk of coming into contact with Arcadis employees.

- Access to private homes and businesses (excluding farms) was not requested, both to reduce exposure risk and to avoid potential for negative reactions to interaction with Arcadis staff.
- Where it was felt that the revised three-tiered approach for a reduced presence on site, without impacting upon the needs of the submission, this approach was adopted to reduce risk associated with surveyor travel.

2.5.8 In 2021 survey area S (Figure 17) was consistently subject to human interference, with the majority of artificial refugia being thrown into the adjacent woodland edge between each visit, in positions of limited or no value for the survey. The population from this area is therefore estimated based on the previous 2017 data and an assessment of the habitat value.

3 Results

3.1 Habitat Assessment of the Site

- 3.1.1 The site, while largely agricultural, supports a range of habitats including woodlands, built areas, arable fields, riparian corridors and grasslands, ranging from improved pastures to semi-improved neutral grasslands.
- 3.1.2 During the initial Phase 1 habitat surveys conducted in October 2016 by Brandon Murray (Principal Ecologist) and Guy Stone (Associate Technical Director), a range of habitats with the potential to support common reptiles were identified. No suitability to support sand lizard or smooth snake was recorded. The habitats on site were assessed as having sub-optimal suitability for adder, but good suitability for slow-worm, common lizard and grass snake.
- 3.1.3 The areas where potential habitat for reptiles was recorded within the site included:
- Field margins and river corridor margins supporting a mosaic of species poor semi-improved neutral grassland, present across the site;
 - A disturbed area in the north east of the site (potentially previously used for a compound area);
 - Areas of species poor semi-improved grassland around the racecourse lake and ditches, and around Westenhanger Castle grounds;
 - An area surrounding a number of dilapidated bunkers to the south west of the site, supporting semi-improved neutral grassland and scrub;
 - The periphery habitats of a disused airfield in the south of the site, including a number of landscape bunds. These areas supported semi-improved neutral grassland, tall ruderal vegetation and scattered scrub;
 - Roadside verges, these areas are largely vegetated with rough grassland and ruderal species;
 - Woodland edges, particularly around Harringe Brooks Woods in the west of the site and Park Wood in the west of the site. These areas supported species poor semi-improved grassland.
 - A lorry park area in the centre of the site south of the A20. This area contained scrub and tall ruderal vegetation and a number of rubble mounds / bunds.
 - Small pockets of rough grassland within a largely arable landscape including an area of grassland around a pond in the south-east of the site.
- 3.1.4 The habitat in survey area B was assessed not to have changed significantly since the original 2017 surveys.
- 3.1.5 No significant changes to habitats were observed during the 2021 surveys.

3.2 Desk Study

- 3.2.1 Desk study information was received from organisations and biological record centres is summarised in Table 4. Information from CSa was taken from a previous Ecological Appraisal for a planning application from within the site and from personal communication with CSa

Ecologists (Jessica Tait 2018). The information from CSa was utilised to provide some background to the site.

3.2.2 Within 2km of the site, four reptile species have been recorded within the last ten years, namely adder, grass snake, common lizard and slow-worm.

Table 4: Desk study data summary

Organisation	Data Received
<p>Kent and Medway Biological Records Centre (Records post 2000 listed), Data Search Conducted March 2018., Updated April 2020</p>	<p>Slow-worm:</p> <ul style="list-style-type: none"> • Within the last ten years, eleven records of slow-worm have been recorded within 2km of the site. This included records from within the vicinity of the site, within Lympe Village (around TR 121 352), and adjacent to the site in Harringe Brooks Woods. <p>Common Lizard:</p> <ul style="list-style-type: none"> • Seven records of common lizard were returned from within the last ten years. One of these records was from within the site and was recorded south of Westenhangar village. (TR127364) in 2013. From the data search, it appears that common lizard are widely distributed in the area surrounding the site. <p>Grass Snake:</p> <ul style="list-style-type: none"> • Thirteen records of grass snake were returned from within 2km of the site from within the last ten years. Only one of these records was from within the site and was recorded south of the A20 (recorded to a low accuracy level four-digit grid reference). It appears that grass snake are widely dispersed in the area in suitable habitats. <p>Adder:</p> <p>Four records were returned from within the last ten years, none of these records were within the site.</p> <ul style="list-style-type: none"> • One record was within Harringe Brooks Woods to the west of the site, and was recorded in 2010 (TR103360); • One record was 2km east of the site in Aldington and was recorded in 2007 (TR0736) • Two records were returned from within Gibbins Brook in 2007, to the north of the site (TR1138). <p>A notable record was also returned which was over ten years old, from immediately north of the site adjacent to the M20. This adder was recorded in 2001 at TR118376.</p> <p>The updated information request in April 2020 did not return any additional reptile species records within 2km of the site.</p>
<p>CSa Environmental Planning</p>	<p>Surveys and mitigation within the Link Park area and Lympe Airfield have been conducted previously. The Link Park area is an area around TR 111 359, west of Lympe Village, with Lympe Airfield being an area around TR 115 352. The location of areas around Link Park and Lympe Airfield referred to in this section are shown in Figure 11.</p> <p>In 2006 low populations of common lizard were found to be present within the Link Park 'Phase 1' and Airfield areas during surveys.</p> <p>In 2007 reptiles were translocated from the Phase 1 Site to newly created landscaped bunds which form the western and southern margins of the consented Phase 2 Site (to the east of the Phase 1).</p> <p>In 2008, a further small-scale translocation was undertaken to remove reptiles from the route of a gas pipeline within the Phase 1 and 2 areas.</p> <p>In total 91 common lizard and 15 grass snake were translocated from the Phase 1 Site, and 9 common lizard and 2 grass snake were translocated from the pipeline route.</p> <p>Some degradation and damage to reptile fencing occurred over time (i.e. between 2007 and 2016), and whilst repairs were made, low populations of common lizard and grass snake were recorded within Phase 1 in 2016, indicating reptiles have re-colonised.</p>

Organisation	Data Received
	Reptile surveys were also undertaken in September 2012 within the former Lymgne Airfield Site. Slow-worm, common lizard and grass snake were recorded. Common lizard was the most abundant with a peak adult count of 13. One pregnant female was recorded and then subsequently recorded with young which confirmed successful breeding on site.

3.3 Field Survey

Overview

- 3.3.1 Across the site, three common reptile species were recorded, common lizard, grass snake and slow-worm. These species were recorded distributed across the site, with the density and distribution varying between species. A description of the results from the Arcadis and CSa surveys is included in this section of this report, which are subdivided for clarity.
- 3.3.2 An overview of the results from the surveys conducted in 2017 is presented as Figure 2. 'Areas' (A – R) referred to within this section are presented within Figure 6.
- 3.3.3 The total number of reptiles recorded during the 2017 Arcadis and CSa surveys combined is shown in the table below (Table 5).

Table 5: Combined results from CSa and Arcadis surveys in 2017

Species	Male	Female	Unknown (Adult)	Juvenile	Neonate	Total
Slow-worm	42	42	4	22	4	114
Grass snake	6	1	20	19	3	49
Common lizard	59	75	113	69	59	375
Total	61	61	79	78	38	538

Arcadis Results Discussion 2017

- 3.3.4 The Arcadis survey area was a large area across the north of the site, containing a range of semi natural habitats. Areas surveyed by Arcadis included field margins presented on Figure 6 (Areas D, C and H), rough grassland areas within a disused racecourse and castle grounds (areas F and E), river corridor margins (Areas A and G), woodland buffer areas (Areas B, M), rough grassland fields (Areas K and L) and disturbed areas (Areas I, N).
- 3.3.5 Over the 10 surveys conducted, three of the four common species of reptiles were found within the Arcadis survey areas, common lizard, grass snake and slow-worm. No adder were identified nor were any rare reptiles (sand lizard and smooth snake) found.
- 3.3.6 For common lizard and slow-worm, distribution was sparse across the survey areas (low population density), with a few areas of higher population density ("good" population according to the key sites assessment methodology). These areas were around the Folkestone Racecourse Lake, East Stour River corridor and associated ditches and grassland areas (Areas F and G). These species were also recorded as a good population towards the north east of site, in an unmanaged, disturbed field bordering the M20 roundabout (Area I) (which appeared to have been disturbed, containing a number of rubble piles). Common lizard

were also present within a geological SSSI (a semi-improved grassland field) south of the A20 (Area L).

- 3.3.7 Records of grass snake were more evenly distributed throughout the site, with a sparse population in habitats across the site. The majority were recorded within Folkestone Racecourse (Area F - a total of nine records with a peak count of two grass snake).
- 3.3.8 Table 6 shows the overall numbers of reptiles recorded according to sex/ age throughout the surveys. Common lizard were the most prevalent on site, with an overall total of 174 individuals being recorded. Slow-worm were the second most common reptile recorded with an overall total of 105 individuals. Thirty-eight grass snake were recorded on site overall, the majority of these were not possible to definitively sex in the field and were recorded as 'unsexed'.

Table 6: Arcadis surveys 2017 overall reptile totals according to sex and age

Species	Male	Female	Unknown (Adult)	Juvenile	Neonate	Total
Slow-worm	39	38	4	21	3	105
Grass snake	1	1	16	17	3	38
Common lizard	21	22	59	40	32	174
Total	61	61	79	78	38	317

- 3.3.9 Given that most juvenile reptiles do not survive past their first year of life, analysing the data in terms of the number of adults found often is more representative of the status of reptiles on site. Therefore Table 7 shows the peak adult count per visit. The greatest number of adult common lizard (23) was recorded during visit 3 (8 June). The greatest number of adult slow-worm (15) was recorded during visit 3 (8 June), the majority of these being around the East Stour River to the west of the racetrack (Area G), and in a disturbed area in the north east of the site (Area I). The highest peak adult count for grass snake was recorded during visit 8 (7-12 September), with grass snake being found throughout the site.

Table 7 Adult count per visit – Arcadis surveys 2017

Visit Number	Date	Slow-worm	Grass snake	Common Lizard	Total
Visit 1	17 – 19, 22 May	4	0	9	13
Visit 2	1 – 2 June	6	3	5	14
Visit 3	8 June	15	1	23	39
Visit 4	13 and 21 June	3	4	2	9
Visit 5	31 August 2017	9	3	14	26
Visit 6	4 – 5 September	7	1	9	17
Visit 7	6 September	8	0	4	12
Visit 8	7 - 12 September	9	2	11	22

Visit Number	Date	Slow-worm	Grass snake	Common Lizard	Total
Visit 9	25 – 26 September	9	1	14	24
Visit 10	27 – 28 September	11	2	11	24
Incidental		0	1	0	1
Total					201

CSa Results 2017

3.3.10 The CSa survey area was predominantly two areas referred to as Link Park and Lymgne Airfield, and is presented in Figure 6 as Areas O, P and Q. These areas are varied, consisting of a disturbed area cleared for a proposed distribution park (Area O), an airfield with a disturbed runway area and surrounding grassed / scrub landscape mounds (Area P) and largely bramble scrub and grassland ecotone adjacent to residential housing, Lymgne Village) (Area Q).

3.3.11 The table below (Table 8) presents the results from the CSa surveys. The vast majority of the reptiles recorded were common lizard, with 201 individuals recorded. Low numbers of slow-worm and grass snake were recorded, with 9 and 11 individuals recorded respectively.

Table 8: Results from the CSa surveys 2017

Species	Male	Female	Unknown	Juvenile	Neonate	Total
Slow-worm	3	4	0	1	1	9
Grass snake	5	0	4	2	0	11
Common lizard	38	53	54	29	27	201
Total						221

3.3.12 The peak count for adult reptiles across the CSa survey area was also examined to determine the relative status of reptiles across the area and is presented in Table 9. Assessed qualitatively, the results suggest that the site as a whole does not support an exceptional population of slow-worm or grass snake, with relatively low peak counts of these reptiles, considering the large area of the site which was surveyed (peak count of 2 slow-worm and 2 grass snake). A larger population of common lizard is suggested by the overall results, with a peak count of 29 adult common lizard recorded. However, when the results area analysed at a smaller scale, it suggests that the area which supports the larger reptile population is likely to be a smaller discreet area. The section below discusses reptile populations throughout the site according to the smaller areas.

Table 9: Total adult counts per visit – CSa surveys 2017

Visit Number	Date	Slow-worm	Grass snake	Common Lizard
Visit 1	19 April	0	0	3
Visit 2	16 May	1	1	28
Visit 3	01 June	0	2	7

Visit Number	Date	Slow-worm	Grass snake	Common Lizard
Visit 4	19 June	0	1	1
Visit 5	01 July	1	1	18
Visit 6	11 July	1	1	29
Visit 7	14 July	2	1	16
Visit 8	25 July	0	0	19
Visit 9	01 August	1	1	7
Visit 10	11 August	1	1	17
Total				161

Arcadis Results 2021

3.3.13 The survey areas were mainly in the centre and east of the site, containing a range of semi natural habitats. An overview of the results from the surveys conducted in 2021 is presented in Figure 13. ‘Areas’ (S – W) referred to within this section are presented within Figure 17.

3.3.14 The total number of reptiles recorded during the 2021 surveys is shown in Table 10, below Table 10

Table 10: Results from Arcadis surveys in 2021

Species	Male	Female	Unknown (Adult)	Juvenile	Neonate	Total
Slow-worm	22	13	6	5	0	46
Grass snake	0	0	10	6	4	20
Common lizard	47	44	94	41	8	234
Total	69	57	110	52	12	300

3.3.15 Over the seven surveys conducted, three of the four common species of reptiles were found within the survey areas, common lizard, grass snake and slow-worm. No adder were identified nor were any rare reptiles (sand lizard and smooth snake) found.

3.3.16 For slow-worm, populations were similar to 2017 levels aside from area W (in the unmanaged field bordering the M20 roundabout) where the population was found to have increased from “good” to “exceptional”.

3.3.17 Common lizard populations were at ‘exceptional’ levels in three areas (T, U, W – Folkestone Racecourse, Lympne airfield and the unmanaged field near the M20 roundabout) and “low” in area V (the geological SSSI).

3.3.18 Records of grass snake were more evenly distributed throughout the site, with a sparse population in most habitats across the site except for within Folkestone Racecourse, where a “good” population was recorded (Area T - a total of sixteen records with a peak count of five grass snake).

3.3.19 Common lizard were the most prevalent reptile species on site, with an overall total of 234 individuals being recorded. Slow-worm were the second most common reptile recorded with

an overall total of 46 individuals. Overall, 20 grass snake were recorded on site, the majority of these were not possible to definitively sex in the field and were recorded as ‘unsexed’.

3.3.20 Given that most juvenile reptiles do not survive past their first year of life, analysing the data in terms of the peak number of adults found often is more representative of the status of reptiles on site. Therefore Table 11 shows the peak adult count per visit. The greatest number of adult common lizard (140) was recorded during visit 7 (26 May) around Lypne airfield (Area U). The greatest number of adult slow-worm (39) was recorded during visit 5 (10 May), the majority of these being around Lypne airfield (Area W) and the field near the M20 roundabout (Area U). The highest peak adult count for grass snake (9) was recorded during visit 6, with most of these found at Folkestone Racecourse (area T). The site itself is too large to be considered on ‘reptile site’ (the site is fragmented by roads so these are likely discreet populations) so smaller ‘areas are used for the population size assessments (presented in the subsequent sections).

Table 11: Adult count per visit – Arcadis surveys 2021

Visit Number	Date	Slow-worm	Grass snake	Common Lizard	Total
Visit 1	13 April	7	0	36	43
Visit 2	19 April	8	1	38	47
Visit 3	27 April	13	2	45	60
Visit 4	06 May	18	1	47	66
Visit 5	10 May	39	5	66	110
Visit 6	19 May	24	9	97	130
Visit 7	26 May	22	8	140	170
Total					626

Reptile Populations by Survey Area 2017

3.3.21 In order to assess the relative value of each of the areas of the site, the survey areas from the Arcadis and CSa surveys were subdivided into multiple smaller survey ‘areas’. These areas were determined according to the habitats that they supported and the connectivity to other areas, as described in the Methodology section above. The results of the surveys within each of these areas is presented in Table 12 overleaf.

3.3.22 Overall, no areas of the site supported an ‘exceptional’ population of any of the reptile species. The sections below describe the results of each section per species.

Grass snake

3.3.23 The results of the grass snake assessment suggest that no area of the site supported a particularly high population of this species, with peak counts in all areas not exceeding two adults. The areas where multiple grass snake were recorded were Area I, Area F and area N, suggesting that these areas supported higher numbers of this species. Overall, all areas of the site supported a maximum population density of ‘low’.

Slow worm

- 3.3.24 The distribution of slow-worm across the site was much more variable, with the majority of the survey areas not supporting this species, and ‘good’ populations being present in a number of areas where this species was present.
- 3.3.25 The areas where good populations were present were Areas F, G, H and I, with a low, but notable population in area Q (considering the absence of this species from elsewhere around the site). No exceptional populations of slow worm were recorded within the survey.

Common lizard

- 3.3.26 This species was widely distributed across the site, with most survey areas supporting this species, but also had a few key areas where populations were higher, and a ‘good’ population is supported. These areas were Areas F, G, I, L and P. No exceptional populations of common lizard were recorded within the survey.

Reptile populations by survey area 2021

- 3.3.27 In order to assess the relative value of each of the areas of the site, the survey areas from the Arcadis 2021 surveys were subdivided into multiple smaller survey ‘areas’. These areas were determined according to the habitats that they supported and the connectivity to other areas, as described in the Methodology section above. The results of the surveys within each of these areas is presented in Table 12 overleaf.
- 3.3.28 Three areas of the site supported an ‘exceptional’ population of common lizard and/or slow worm. The sections below describe the results of each section per species.
- 3.3.29 No valid results were recorded from Area S due to human interference with the surveys. Therefore, where a species was present in 2017, in order to work on a precautionary basis it is presumed that the populations will have remained at at least the same level.

Grass snake

- 3.3.30 The results of the grass snake assessment suggest that no area surveyed site supported a particularly high population of this species, though Area T did support a “good” population with a peak count of five adults; otherwise, no area’s peak count exceeded three. The areas where multiple grass snake were recorded were Area T, Area U and area W, suggesting that these areas supported higher numbers of this species.

Slow worm

- 3.3.31 The distribution of slow-worm across the site was more variable, with two of the survey areas not supporting this species, an ‘exceptional’ population in area U and a “good” population in area T.
- 3.3.32 Area S did not support slow worm in 2017 so it is presumed that this was still the case at the time of the 2021 surveys as the habitat was similar to the 2017 surveys.

Common lizard

- 3.3.33 This species was widely distributed across the areas surveyed, with all survey areas supporting this species. Areas T, U and W supported “exceptional” populations while Area V supported a “low” population.
- 3.3.34 Area S is presumed to have supported a “low” population as the habitat was similar to the 2017 surveys, in contrast to area T which saw an increased population and some increase in habitat value.

Otterpool Park
 ES Appendix 7.6: Reptile Survey Report – Update to Include 2020 and 2021 Survey Data
 Table 12: Counts per survey area, peak count and population density assessment (2017 surveys)

Area	Description	Approximate Density of	Slow-worm							Estimated Population Size	Common Lizard							Estimated Population Size	Grass Snake							Estimated Population s
			Adult Male (>230mm)	Adult Female (>230mm)	Unsexed	Juvenile	Neonate	Slow-Worm TOTAL	Peak Adult Count		Adult Male	Adult Female	Unsexed	Juvenile	Neonate	Common Lizard TOTAL	Peak Adult Count		Adult Male	Adult Female	Unsexed	Juvenile	Neonate	Grass snake TOTAL	Peak Adult Count	
A	River Corridor west of Barrow Hill, Sellindge	10 per ha	5	3		3		11	2	Low	2		3	7	1	13	3	Low				2		2		Low
B	Areas around Park Wood	10 per ha	1	1				2	1	Low						0		Absent				2		2		Low
C	Hedgerow / stream Between river corridor towards Harringe Brooks Woods	10 per ha						0		Absent			1		1		Low							0		Absent
D	Field margin / hedgerow	10 per ha	2	1		1		4	2	Low	2	2	4	4	1	13	4	Low			3	1		4	1	Low
E	Area behind Westenhanger Castle	10 per ha		1		1		2	1	Low		1	1	1	7	10	1	Low						0		Absent
F	Area around Racecourse Lake and associated Ditches	10 per ha	6	4	1	4		15	6	Good	4	5	5	4	2	20	5	Good		1	4	4		9	2	Low
G	River corridor between Western Hanger and Barrow Hill, Sellindge	10 per ha	4	11	1	2	1	19	6	Good	1	3	9	4		17	5	Good				5		5	0	Low
H	Field margins east of Westenhanger	10 per ha						0		Absent						1	1	Low						0		Absent
I	Ditches and cleared ground south of M20 Junction 11 roundabout / Hilhurst Farm	10 per ha	21	17	2	11	1	52	8	Good	8	3	22	6	19	58	15	Good	1		1	1		3	2	Low
J	Defunct Lorry Park south of the A20	10 per ha						0		Absent	1	3		1		5	2	Low			1			1	1	Low

Otterpool Park
 ES Appendix 7.6: Reptile Survey Report – Update to Include 2020 and 2021 Survey Data

Area	Description	Approximate Density of	Slow-worm							Estimated Population Size	Common Lizard							Estimated Population Size	Grass Snake						Estimated Population s	
			Adult Male (>230mm)	Adult Female (>230mm)	Unsexed	Juvenile	Neonate	Slow-Worm TOTAL	Peak Adult Count		Adult Male	Adult Female	Unsexed	Juvenile	Neonate	Common Lizard TOTAL	Peak Adult Count		Adult Male	Adult Female	Unsexed	Juvenile	Neonate	Grass snake TOTAL		Peak Adult Count
K	Area around pond	10 per ha						0		Absent	1					1	1	Low						0		Absent
L	Area around SSSI.	10 per ha						0		Absent	2	6	8	12	2	30	7	Good						0		Absent
M	Area of grassland east of Harringe Brooks woods	10 per ha						0	0	Absent		1	1			2	1	Low			2	2		4	1	Low
N	Area around dilapidated bunkers and barracks.	10 per ha						0	0	Absent		1	1			2	1	Low			4		3	7	2	Low
O	Airfield runway and edges.	20 per ha						0	0	Absent	20	31	30	15	18		8	Low (Adjusted for increased tile density)	4		2			6	1	Low
P	Disturbed area around Link Park land	20 per ha						0	0	Absent	17	22	24	14	9	86	12	Good ((Adjusted for increased tile density)			1	1		2	1	Low
Q	Field margin adjacent to houses.	20 per ha	3	4		1	1	9	2	Low (Adjusted for increased tile density)	1		1			2	1	Low (Adjusted for increased tile density)	1		1	1		3	1	Low
R	Field margins west of Newingreen (incidentals)	20 per ha						0	0	N/A							0	N/A			1			1	1	N/A

Table 13: Results by survey area in 2021

* Areas S – W: data from 2021 surveys

Area	Description	Slow-worm									Estimated Population Size	Common Lizard							Estimated Population Size	Grass Snake							Estimated Populations
		Approximate Density of Tiles	Adult Male (>230mm)	Adult Female (>230mm)	Unsexed	Juvenile	Neonate	Slow-Worm TOTAL	Peak Adult Count	Adult Male		Adult Female	Unsexed	Juvenile	Neonate	Common Lizard TOTAL	Peak Adult Count	Adult Male		Adult Female	Unsexed	Juvenile	Neonate	Grass snake TOTAL	Peak Adult Count		
S (comparable to area B in 2017)	Areas around Park Wood	No valid results from 2021 surveys due to human interference.									Presumed Good	No valid results from 2021 surveys due to human interference.							Presumed Absent	No valid results from 2021 surveys due to human interference.							Presumed Good
T (comparable to Area F in 2017)	Area around Racecourse Lake, associated Ditches and the 'straight' to the west	10 per ha	23	22	5	8	0	58	8	Good	29	28	55	7	1	120	32	Exceptional	0	0	16	8	4	28	5	Good	
U (comparable to Area I in 2017)	Cleared ground south of M20 Junction 11 roundabout / Hillhurst Farm	10 per ha	58	21	2	0	0	81	23	Exceptional	53	36	43	0	0	132	30	Exceptional	0	0	3	6	0	9	3	Low	
V (comparable to area L in 2017)	Area around SSSI	10 per ha	0	0	0	0	0	0	0	Absent	2	2	2	8	1	15	2	Low	0	0	0	0	0	0	0	Absent	
W (Comparable to Area O and P in 2017)	Airfield runway and edges and disturbed area around Link Park land	10 per ha	0	0	0	0	0	0	0	Absent	46	74	99	90	13	322	87	Exceptional	0	0	7	0	0	7	3	Low	

The table below (Table 14) provides a comparison of Reptile populations surveyed in 2017 and 2021. Although the survey areas were not identical between the surveys due to changes in habitat and access, they are considered suitable comparable to be of use in indicating a change in population.

Table 14: comparison of the reptile populations in survey areas in 2017 and 2021

Area	Slow Worm		Common Lizard		Grass Snake	
	2017	2021	2017	2021	2017	2021
B (2017) S (2021)	Low	Presumed Low	Absent	Presumed Absent	Low	Presumed Low
F (2017) T (2021)	Good	Good	Good	Exceptional	Low	Good
I (2017) U (2021)	Good	Exceptional	Good	Exceptional	Low	Low
L (2017) V (2021)	Absent	Absent	Good	Low	Absent	Absent
O/P (2017) W (2021)	Absent	Absent	Good (peak area)	Exceptional	Low	Low

In summary, between the 2017 surveys and the 2021 surveys, the reptile population associated with area B/S is assessed to be likely to have stayed the same (although it was not possible to confirm this due to interference with the survey). The reptile population associated with area F/T had changed in that the populations of both common lizard and grass snake had increased from ‘good’ to ‘exceptional’. This is assessed to be a result of the reduced usage of this area which has led to some areas becoming more densely vegetated. The population of reptiles associated with area I/U had also increased, with the populations of both slow worm and common lizard going from a good population to an exceptional population (although it must be noted that this area is not within the redline of the site for the 2022 application). It is considered that this is likely due to the populations increasing to fill the carrying capacity of this relatively recently created habitat. The population of reptiles associated with area L/V was largely the same as when previously surveyed in 2017, with only the population of common lizard changing, the population reducing to low from good. This is likely due to modified grazing regime in this area. The population of reptiles associated with area O/P/W was largely the same, except for common lizard, whose population had increased from ‘good’ to ‘exceptional’. This is likely due to the population increased after the translocation to the carrying capacity of the created site.

4 Discussion

- 4.1.1 This section of the report includes an assessment of the results presented above of the value of the site overall and smaller areas of the site for reptiles.

4.2 Grass Snake

- 4.2.1 Overall, the site supported a low population of grass snake which are distributed widely in appropriate habitats across the site, though the grassland and ditches between Folkestone Racecourse Lake and the East Stour river corridor supports a good population. An area around Lymgne Airfield has previously been utilised as a receptor site for reptiles, including grass snake, and this area (within area O) was found to support this species.
- 4.2.2 Overall, the site is unlikely to be of significant importance for this species when considered at a wider geographical scale. Considering the desk study data for the site (which returned records of grass snake from across the local area) it is assessed that the site overall is likely to be of local importance for grass snake. However, this species appears to be in 'general decline' nationally (Humphreys *et al.*, 2011), so safeguarding individual grass snake and the grass snake population in and around the site will be an important consideration.

4.3 Slow-worm

- 4.3.1 Overall, the site supported a few distinct areas which tended to support a good population of this species. Considering the desk study data for this species, which returned multiple records for this species across the area, and the widespread distribution of this species within Kent, it is considered that the site overall is unlikely to have value above local value for this species. However, small, distinct areas of the site are likely to be of particular value, being of local value in themselves. This species appears to be in 'general decline' nationally (Humphreys *et al.*, 2011), so ensuring the maintenance of slow-worm populations will be an important consideration.

4.4 Common Lizard

- 4.4.1 The site supported a widespread distribution of this species, with a few areas supporting higher populations. Overall, the site is likely to be of local importance for this species, considering the widespread distribution across Kent. An area around Lymgne Airfield has previously been utilised as a receptor site for reptiles, including common lizard, and this area (within area O, the previous reptile receptor site) was found to support an exceptional population of this species.
- 4.4.2 As with slow-worm, a few areas of the site did support 'good' populations. As with the other species of reptile recorded, this species appears to be in 'general decline' nationally (Humphreys *et al.*, 2011), and mitigation for impacts to this species will be required within a proposed Development.

4.5 Adder

- 4.5.1 No adder were observed within the survey area. However, it is known that this species has been recorded within the vicinity of the site (from desk study data) and anecdotal evidence from local residents suggests that this species has been noted within the site area¹. As such, a precautionary assessment that adder may be present at very low densities in the vicinity of the site has been made. It is however assessed that the mitigation proposals for the other common reptile species which were recorded on the site will also provide adequate mitigation for adder should they be present within the site.

4.6 Change in Populations 2017 – 2021

- 4.6.1 Between the 2017 surveys and the 2021 surveys, the reptile population associated with area B/S is assessed to be likely to have stayed the same (although it was not possible to confirm

¹ Personal communication with local residents at public consultation, 20/06/2018

this due to interference with the survey). The reptile population associated with area F/T had changed in that the populations of both common lizard and grass snake had increased from ‘good’ to ‘exceptional’. This is assessed to be a result of the reduced usage of this area which has led to some areas becoming more densely vegetated. The population of reptiles associated with area I/U had also increased, with the populations of both slow worm and common lizard going from a good population to an exceptional population. It is considered that this is likely due to the populations increasing to fill the carrying capacity of this relatively recently created habitat. The population of reptiles associated with area L/V was largely the same as when previously surveyed in 2017, with only the population of common lizard changing, the population reducing to low from good. This is likely due to modified grazing regime in this area. The population of reptiles associated with area O/P/W was largely the same, except for common lizard, whose population had increased from ‘good’ to ‘exceptional’. This is likely due to the population increased after the translocation to the carrying capacity of the created site.

4.7 Extrapolation of Reptile Results

4.7.1 In order to assess the impact from proposed Development upon reptiles, and to ensure that adequate avoidance, mitigation, compensation and enhancement can be implemented, a calculation of the total area of the site supporting reptile populations was undertaken. Due to the survey limitations described above (namely access issues, risks of (and actual) interference from the public and due to the farming practices of certain areas of the site), some areas which had the potential to support reptiles could not be surveyed. Within these areas, a precautionary assessment of likely population is made, utilising data obtained from the areas which were surveyed. Figure 7 presents the areas in which it has been assessed that the presence of reptile populations is considered likely, inferred from the habitats present and comparable survey areas. The table below (Table 15) shows the calculated areas for which reptile populations have been inferred.

Table 15: Population estimates extrapolated or inferred

Areas	Areas population inferred from	Inferred population
Road verges (not surveyed due to risk of interference from members of the public).	Nearby field margins	Low
Field margins which were not possible to survey due to risk from farming practices.	Nearby field margins	Low, but habitat area is limited due to farming practices.
River corridor south of the A20 (not surveyed due to farming practices in that area)	River corridor north of the A20	Good, but habitat area is limited due to farming practices.

4.8 Reptile Habitat Required within the Proposed Development

4.8.1 Overall, it is calculated that within the developed Otterpool site, approximately 52ha of suitable connected functional high-quality reptile habitat will be required to safeguard the reptile population present within the site. The baseline habitat of the site is largely low quality, supporting low or good populations of reptiles, and provision of a comparative area of higher quality habitat should ensure that the conservation status of reptiles within the Otterpool site is safeguarded and enhanced.

5 Mitigation Recommendations and Further Work

5.1 Introduction

5.1.1 This section of this report outlines the mitigation proposed to ensure the favourable conservation status of reptiles within the proposed Development. This section does not constitute a full outline of the reptile mitigation on the site, this will be provided within the Reptile Mitigation Strategy and will be evolved during detailed design.

5.2 Design Mitigation

Avoidance

5.2.1 In line with the mitigation hierarchy, the first step of the proposed mitigation for impacts to common reptiles will be avoidance. Within the development, many areas of value for reptiles will be retained and enhanced.

5.2.2 Examples of areas where reptile habitats will be retained and enhanced include:

- Areas around the Racecourse lake;
- Areas along the East Stour river corridor north and south of the A20;
- Bunds around the Lymyne Airfield site (including Area O which have previously been utilised as a receptor site for animals translocated from the Link Park sites).

Mitigation

5.2.3 Within the development, there will be embedded design measures to ensure that reptiles can utilise areas of the site and move through the site. This will include retention and enhancement buffers of rough grassland around retained habitat features including hedgerows and between retained areas of habitats. In addition, SuDS areas, where appropriate, will be designed to provide reptile habitats with the provision of rough grassland and hibernacula.

5.2.4 Elsewhere within the site, areas designed specifically to provide habitat for reptiles will be created, including a large area (approximately 15ha) in the north west of the site, which will be a dedicated nature area, and will include dedicated enhancement for reptiles, including a mosaic of species rich grassland and scrub, hibernacula and water bodies.

5.3 Additional Mitigation

5.3.1 During detailed design and construction of the development, it is likely that displacement and translocation actions will need to be undertaken to ensure that individual reptiles and populations of reptiles are safeguarded during the works. This is likely to include:

- Habitat Enhancement Creation and Management plans to be evolved with the detailed design and phasing of the development;
- Detailed Reptile Mitigation Strategies will be required to be evolved with the detailed design and phasing of the development;
- Habitat manipulation to displace reptiles into retained habitats adjacent to habitats to be removed; and
- Manual capture and translocation of reptiles from areas to be lost into retained / enhanced habitats.

5.3.2 It is likely that there will need to be a suite of enhancement conducted to ensure that areas identified for reptiles to be translocated into are prepared for the translocation ahead of the translocation commencing. It is also likely that a suite of monitoring and maintenance works will be required in relation to the proposed project. translocation commencing. It is also likely

that a suite of monitoring and maintenance works will be required in relation to the proposed project.

5.4 Operational Mitigation

Safeguarding Habitats

- 5.4.1 In order to minimise operational impacts to reptile populations, likely to be predominantly through human disturbance and impacts from domestic animals, the following approaches would be implemented:
- Green infrastructure would be designed to limit human accessibility to the most sensitive areas;
 - Buffers will be created and maintained around retained and created reptile areas to limit impacts from humans and domestic animals; and
 - Newly created habitats, particularly the are in the north west will be positioned away from development where possible to minimise impacts from humans.
- 5.4.2 Maintenance and monitoring
- 5.4.3 Maintenance and monitoring will be required of any retained or created habitats. An outline of the desired outcomes for the monitoring and maintenance is provided within a site BAP (ES Technical Appendix 7.20). As each phase parcel is brought forward for development, detailed strategies will be required for creation, management and maintenance of the habitats created will be required (this is beyond the remit of this document).
- 5.4.4 A broad outline of the locations of proposed habitat creation is provided within the mitigation strategies (ES Technical Appendix 7.18).

5.5 Further Survey

- 5.5.1 It is assessed that there is potential for a requirement for further survey and assessment as the development proceeds. The following may be required:
- Further surveys in sections of the site to determine translocation requirements as detailed designs are finalised (dependent upon the time elapsed since the initial surveys and habitat condition), this survey is likely to be required to inform Tier 3 planning;
 - Monitoring surveys during and subsequent to translocations / mitigation works to monitor and assess mitigation success.

6 Conclusions

- 6.1.1 Dedicated reptile surveys were undertaken across the site in 2017 by Arcadis and CSa Environmental and a habitat assessment update undertaken across the site in 2020 by Arcadis. Dedicated reptile surveys were also carried out by Arcadis in 2021 in targeted areas in order to update the data.
- 6.1.2 The survey area covered potentially suitable habitat within the application site boundary with exception of land where access was not permitted or surveying was not practicable or would expose reptile populations to increased risk of persecution.
- 6.1.3 Across the site, three common reptile species were recorded, common lizard, grass snake and slow-worm. In total in 2017, over 600 individual records of reptiles were recorded across the site; in 2021, over 600 individual records of reptiles were recorded in the targeted areas.
- 6.1.4 The results of the 2017 and 2021 surveys suggested that no area of the site supported a particularly high population of grass snake, with peak counts in all survey areas not exceeding five adults. Distribution across the site was widespread but at low density. The site overall is likely to be of local importance for grass snake. However, this species appears to be in 'general decline' nationally (Humphreys et al., 2011),
- 6.1.5 The distribution of slow-worm across the site was much more variable, with the majority of the survey areas not supporting this species, good populations being present in a number of areas where this species was present and one area supporting an exceptional population (field near to the M20 roundabout in the northeast). The site overall is unlikely to have value above local value for this species. However, small, distinct areas of the site are likely to be of particular value, being of local value in themselves. This species appears to be in 'general decline' nationally (Humphreys et al., 2011),
- 6.1.6 Common lizard was widely distributed across the site, with most survey areas supporting this species, but also a few key areas where populations were higher and a 'good' or 'exceptional' population was supported. Overall, the site is likely to be of local importance for this species, considering the widespread distribution across Kent. However, as with slow-worm, a few areas of the site did support 'exceptional' populations. This species appears to be in 'general decline' nationally (Humphreys *et al.*, 2011).
- 6.1.7 Adder were not recorded within the site, but communication with local residents suggested that this species may be present, and the desk study returned records of this species from within 2km of the site. Design mitigation within the Framework Masterplan for the reptile species recorded on the site will enable mitigation for this species to be incorporated within the development.
- 6.1.8 In line with the mitigation hierarchy, the first step of the proposed mitigation for impacts to common reptiles will be avoidance. Within the development, many areas of value for reptiles will be retained and enhanced.
- 6.1.9 In addition, within the development, there will be embedded design measures to ensure that reptiles can utilise areas of the site and move through the site. This will include buffers of rough grassland around retained habitat features including hedgerows and between retained areas of habitats. In addition, SuDS areas, where appropriate, will be designed to provide reptile habitats with the provision of rough grassland and hibernacula.
- 6.1.10 Elsewhere within the site, areas designed specifically to provide habitat for reptiles will be created, including a large area (approximately 15ha) in the north-west of the site, which will be

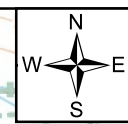
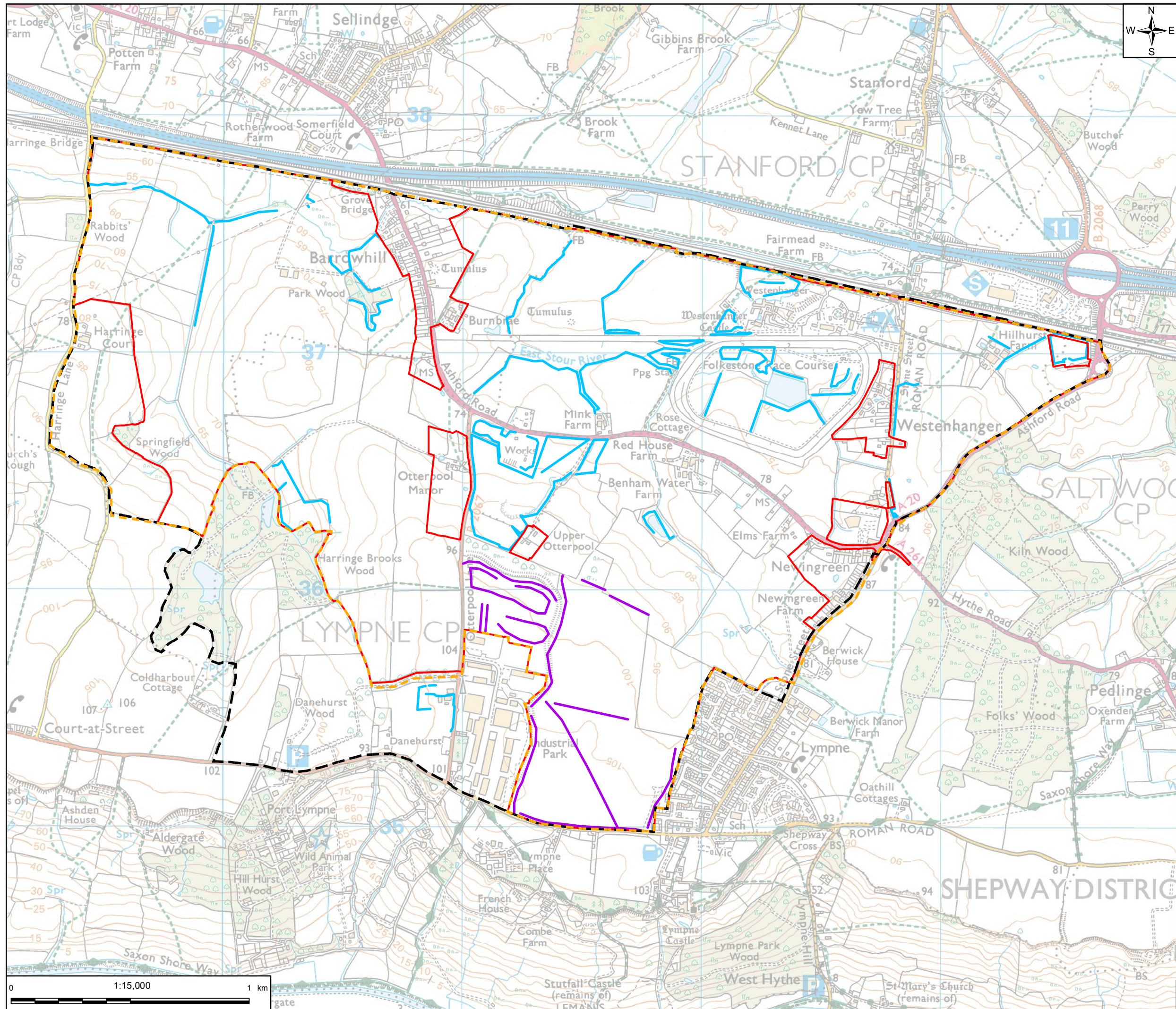
a specific nature area, and will include specific enhancement for reptiles, including a mosaic of species rich grassland and scrub, hibernacula and water bodies.

- 6.1.11 During components of the development, it is likely that displacement and translocation actions will need to be undertaken to ensure that individual reptiles and populations of reptiles are safeguarded during the works. This is likely to include:
- Habitat manipulation to displace reptiles into retained habitats adjacent to habitats to be removed;
 - Manual capture and translocation of reptiles from areas to be lost into retained / enhanced habitats.
- 6.1.12 It is likely that there will need to be a suite of enhancement conducted to ensure that areas identified for reptiles to be translocated into are prepared for the translocation ahead of the translocation commencing. It is also likely that a suite of monitoring and maintenance works will be required in relation to the proposed project. These requirements will need to be specified for each some of the development as it is brought forward for planning.

7 References

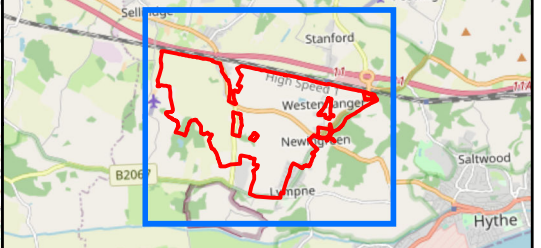
Ref. No.	Description
Ref. 1	CSa Environmental Planning (2013) Ecological Appraisal – Lympne, Former Lympne Airfield – Proposed Housing Development.
Ref. 2	Ecology Solutions Ltd (2014) Ecological Assessment, Land at Sellindge, Kent.
Ref. 3	Ecotricity (2012) Harringe Brooks Wind Park Environmental Statement.
Ref. 4	Froglife (1999) Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.
Ref. 5	HMSO (1981) <i>Wildlife and Countryside Act 1981</i> . HMSO, London.
Ref. 6	HMSO (2000) <i>Countryside and Rights of Way Act 2000</i> . HMSO, London.
Ref. 7	HMSO (2006) <i>Natural Environment and Rural Communities Act 2006</i> . HMSO, London.
Ref. 8	HMSO (2017) <i>The Conservation of Habitats and Species Regulations 2017</i> . HMSO, London
Ref. 9	Humphreys, E., Toms, M., Newson, S., Baker, J. and Wormald, K. (2011) <i>An examination of reptile and amphibian populations in gardens, the factors influencing garden use and the role of a 'Citizen Science' approach for monitoring their populations within this habitat</i> . Available online: https://www.bto.org/our-science/publications/research-reports/examination-reptile-and-amphibian-populations-gardens [Accessed November 2020].
Ref. 10	NBN Atlas Partnership (undated) <i>NBN Atlas</i> . Available online: https://nbnatlas.org/ [Accessed April 2020].
Ref. 11	Sewell, D., Griffiths, R., Beebee, T.J.C., Foster, J. and Wilkinson, J. (2013) <i>Survey protocols for the British herpetofauna: Version 1.0</i> . Available online: http://narrs.org.uk/documents/Survey_protocols_for_the_British_herpetofauna.pdf [Accessed November 2020].
Ref. 12	Waterman Energy, Environment & Design Limited (2010) <i>Ecological Appraisal, Folkestone Racecourse, Kent</i> .

Figure 1: Location of reptile survey refugia



- Legend**
- Study Area Boundary
 - Outline Planning Application Boundary
 - Framework Masterplan Boundary
 - Arcadis Reptile Survey
 - CSa Reptile Survey

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01	09-10-2020	FOR INFORMATION	AD	BM	MG

ARCADIS
 80Fen
 80 Fenchurch Street
 London
 EC3M 4BY


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Figure 1
 Location of Reptile Survey Refugia

scale	original size	datum	grid
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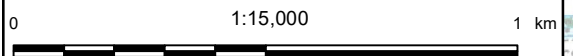
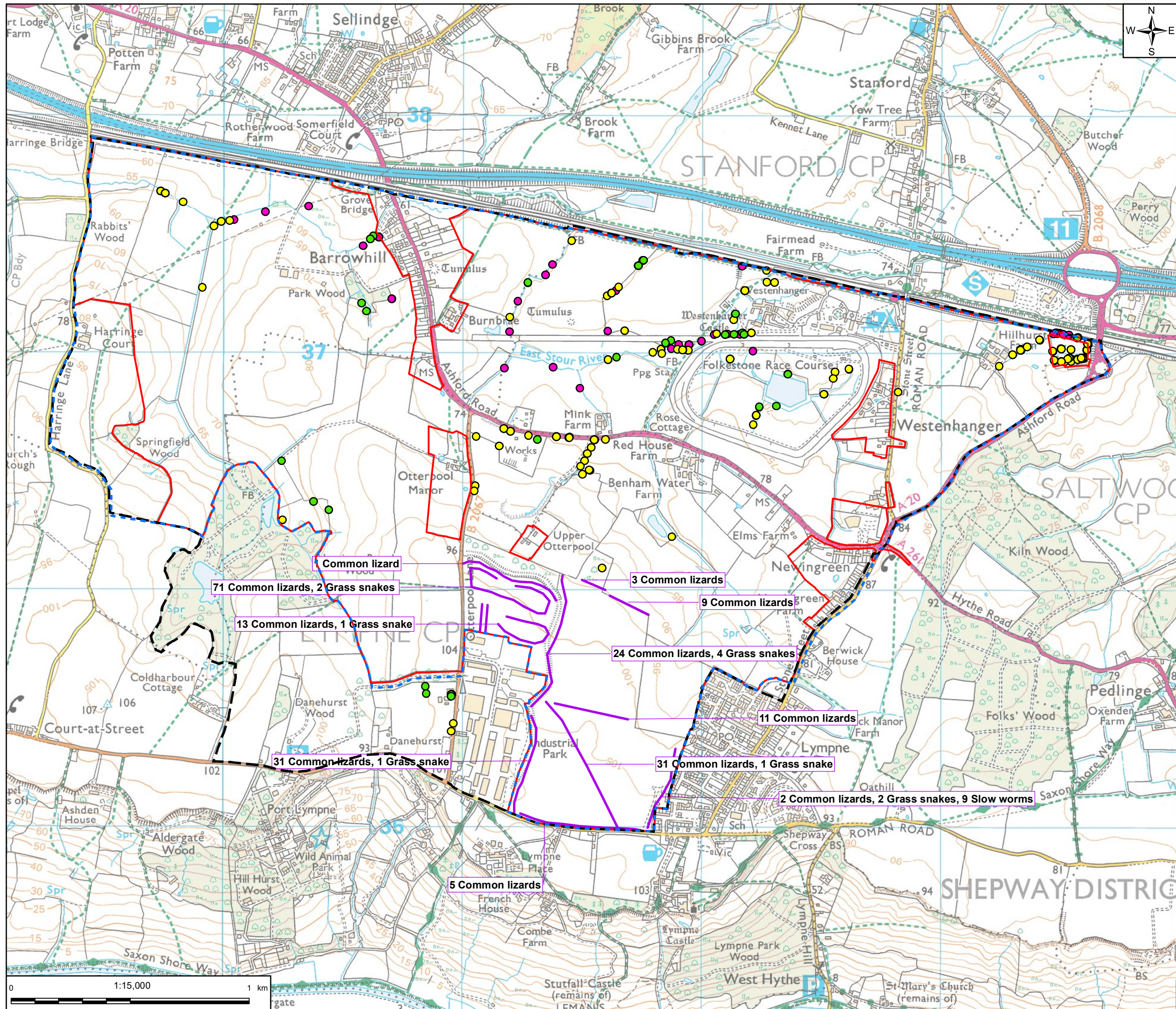


Figure 2: Reptile survey results – overview



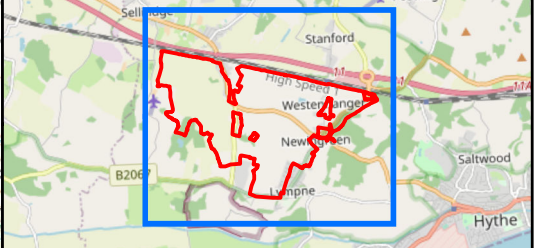
Legend

- Study Area
- Outline Planning Application Boundary
- Framework Masterplan Boundary

Arcadis survey results

- Common lizard
- Grass snake
- Slow worm
- CSA Reptile Survey

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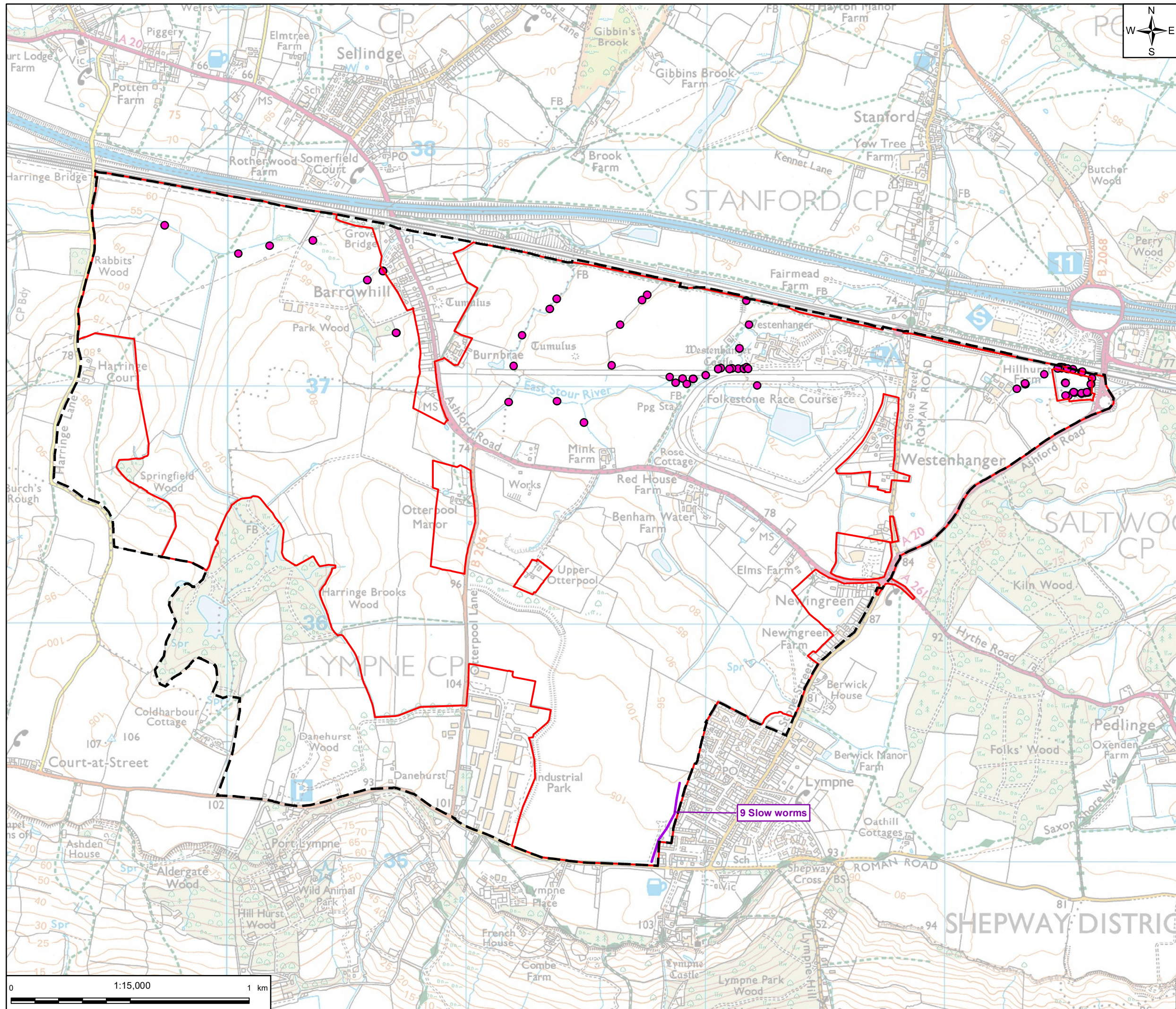
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Figure 2
Reptile Survey Results Overview

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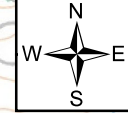
Figure 3: Reptile survey results slow-worm

N.B. Locations of reptiles within the CSa survey area are indicative only as locational data was only given to a survey 'zone'. Positions are given within each survey zone to allow visual representation of results.

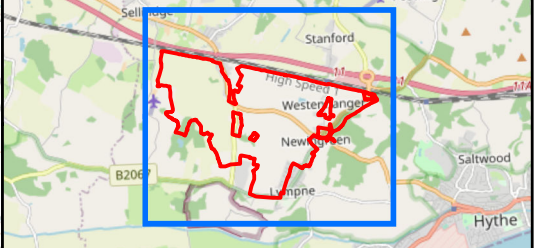


Legend

- Outline Planning Application Boundary
- Framework Masterplan Boundary
- Slow Worm (Arcadis Survey)
- CSa Reptile Survey Results



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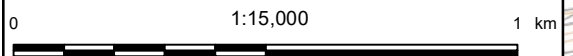


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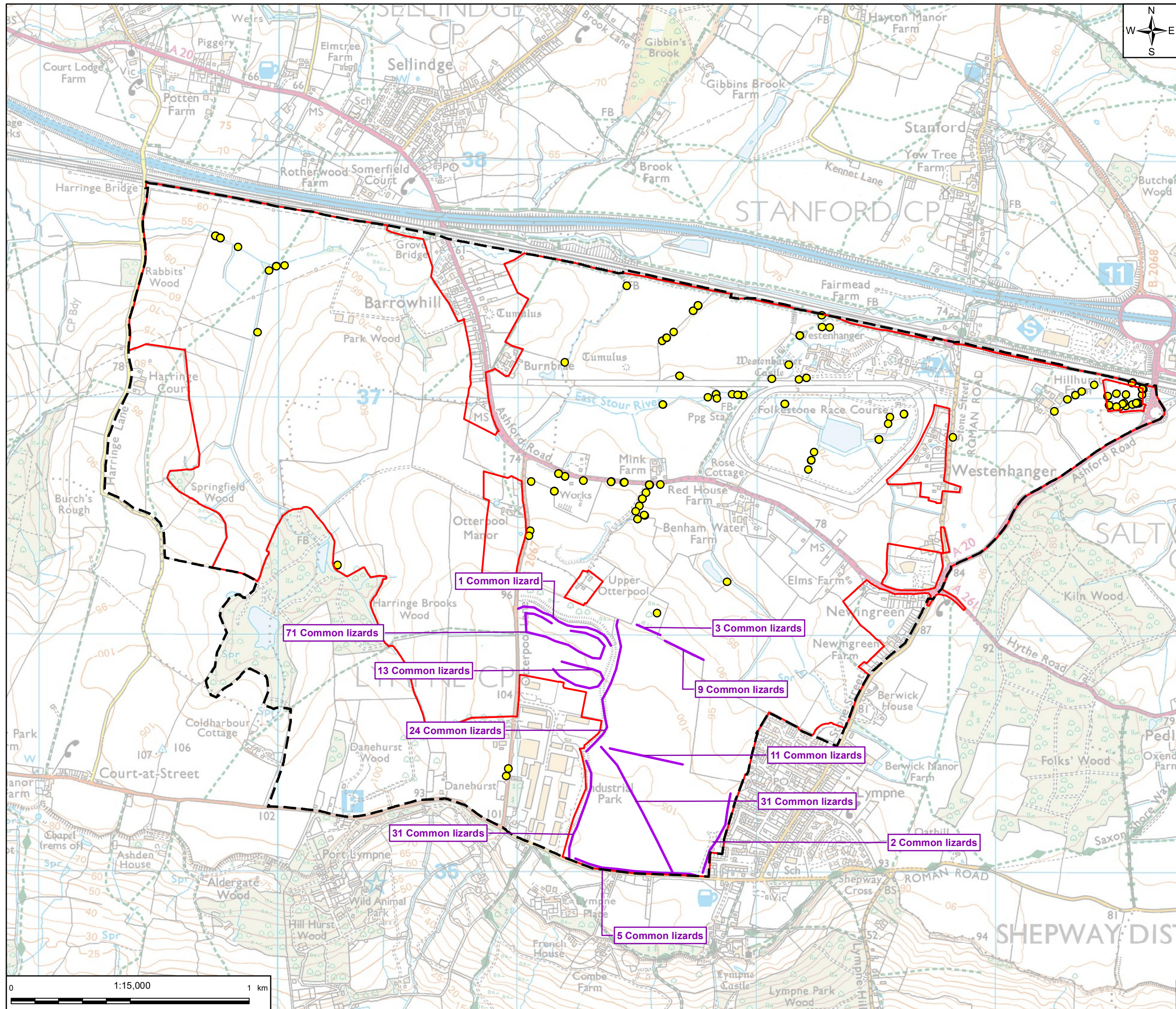
Figure 3
Reptile Survey Results
Slow Worms



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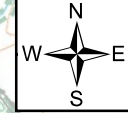
Figure 4: Reptile survey results common lizard

N.B. Locations of reptiles within the CSa survey area are indicative only as locational data was only given to a survey 'zone'. Positions are given within each survey zone to allow visual representation of results.

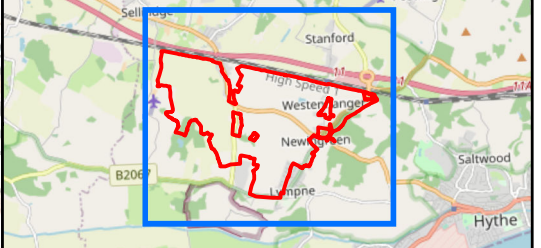


Legend

- Outline Planning Application
- Framework Masterplan Boundary
- Common Lizard (Arcadis Survey)
- CSa Reptile Survey Refugia



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01	23-11-2018	FOR INFORMATION	AD	BM	MG

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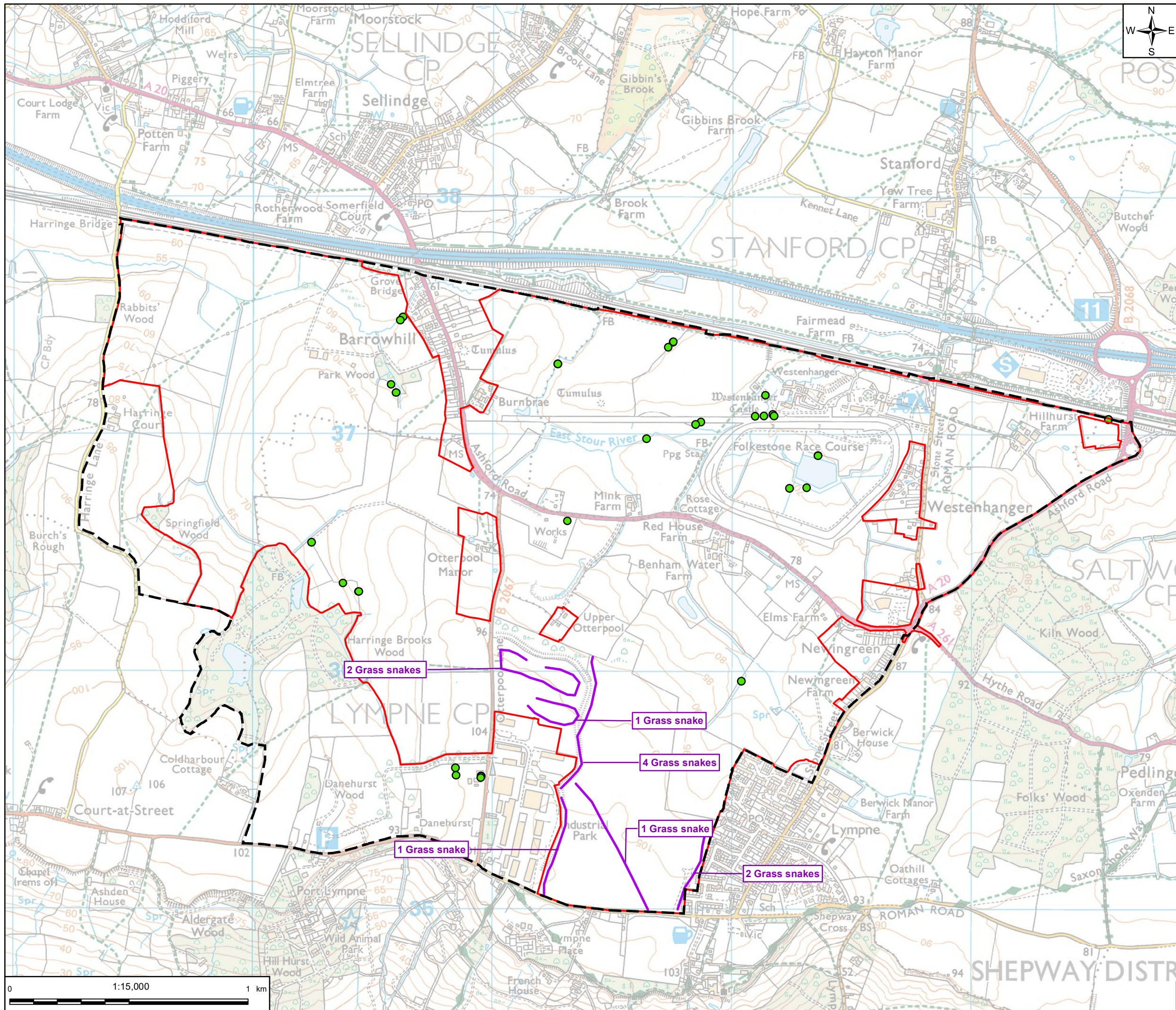
Figure 4
Reptile Survey Results
Common Lizards



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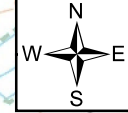
Figure 5: Reptile survey results grass snake

N.B. Locations of reptiles within the CSa survey area are indicative only as locational data was only given to a survey 'zone'. Positions are given within each survey zone to allow visual representation of results.

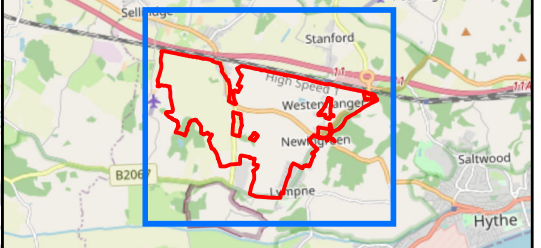


Legend

- Outline Planning Application Boundary
- Framework Masterplan Boundary
- Grass Snake (Arcadis Survey)
- CSa reptile survey grass snake results



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REV	Date	Description	Drawn	Check	Approv
02	03-03-2022	FOR INFORMATION	PS	BM	MG
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Figure 5
Reptile Survey Results
Grass Snakes

scale	original size	datum	grid
1: 15,000	A3	Sx	BNG

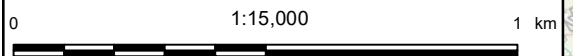
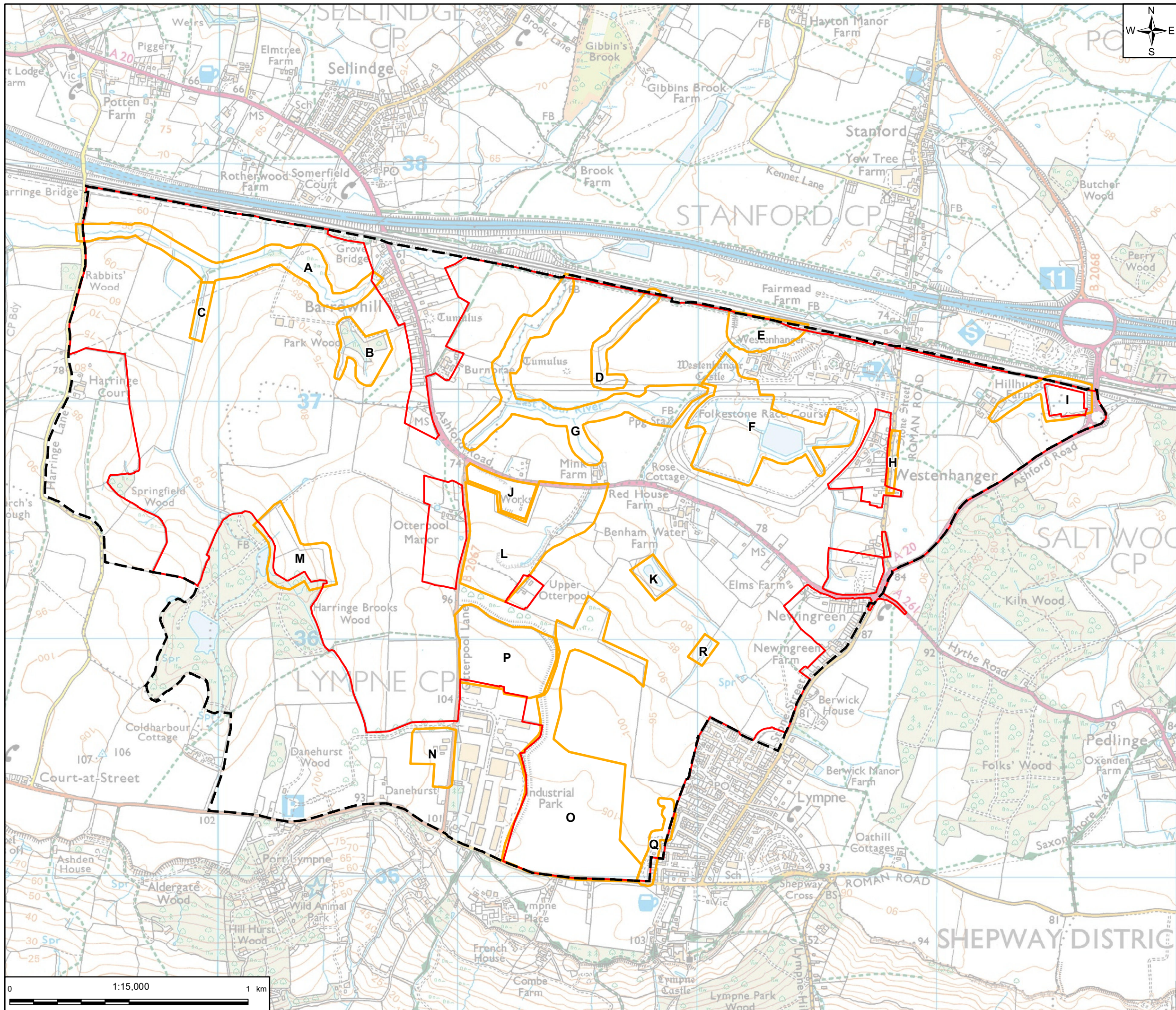
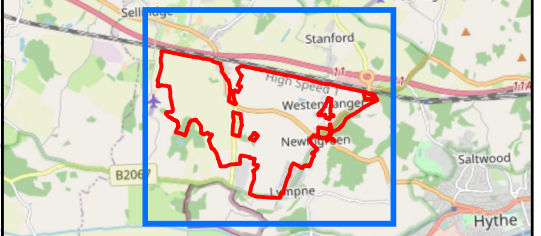


Figure 6: Reptile survey 'areas'



- Legend**
- Outline Planning Application Boundary
 - Framework Masterplan Boundary
 - Survey Results Area

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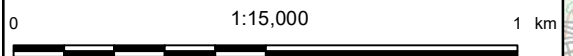


REV	Date	Description	Drawn	Check	Approv
02	03-03-2022	FOR INFORMATION	PS	BM	MG
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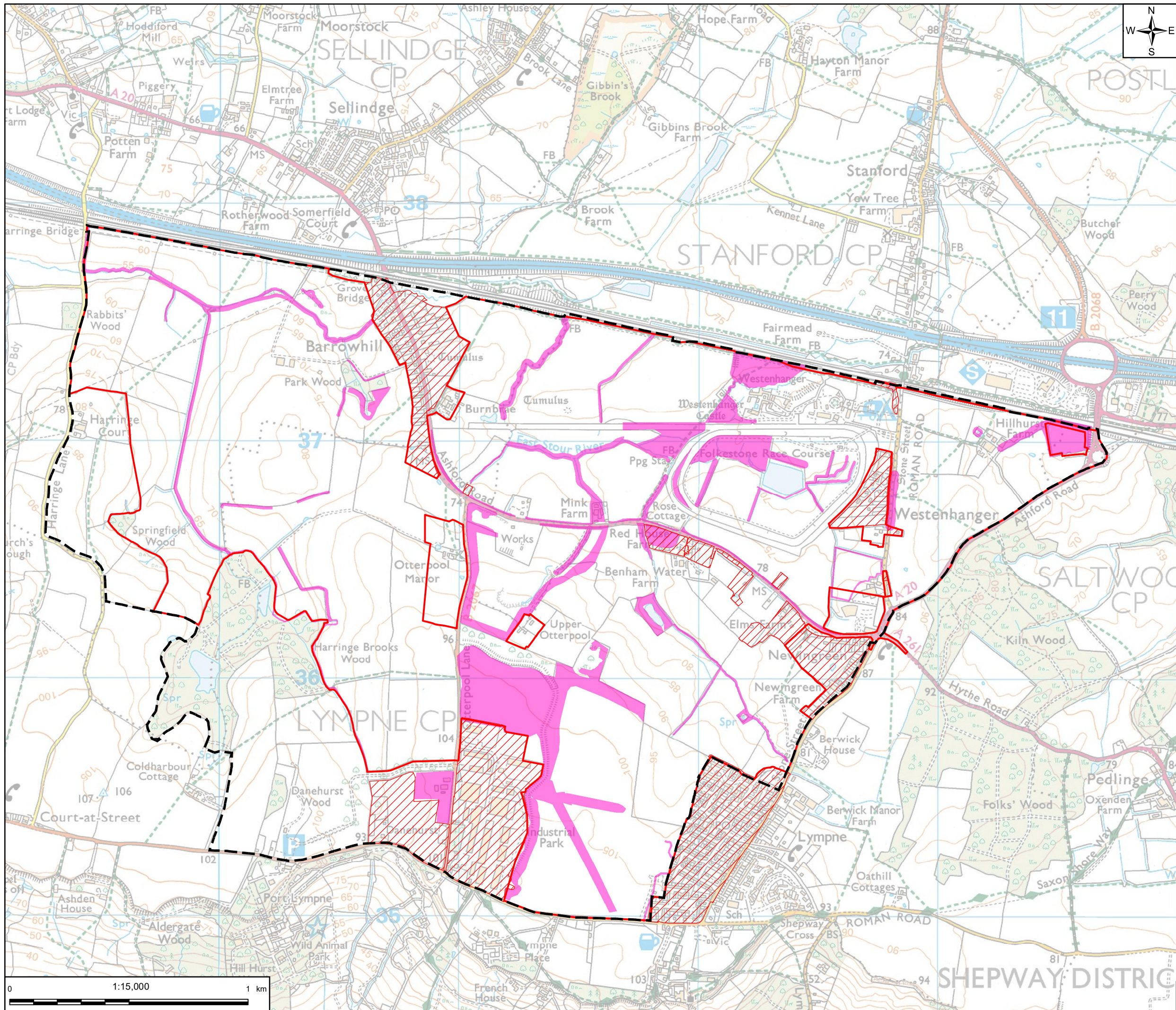
Figure 6
 Reptile Survey Results Survey Areas



scale	original size	datum	grid
1: 15,000	A3	Sx	BNG

Figure 7: Inferred reptile habitat areas

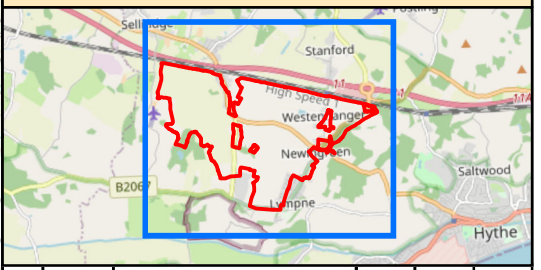
This figure shows the inferred habitat areas which are suitable for reptiles across the Otterpool Site.



Legend

- Outline Planning Application Boundary
- Framework Masterplan Boundary
- Area not possible to survey
- Reptile Habitat - Surveyed and Inferred

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REV	Date	Description	Drawn	Check	Approv
02	03-03-2022	FOR INFORMATION	PS	BM	MG
01	22-11-2018	FOR INFORMATION	AD	BM	MG

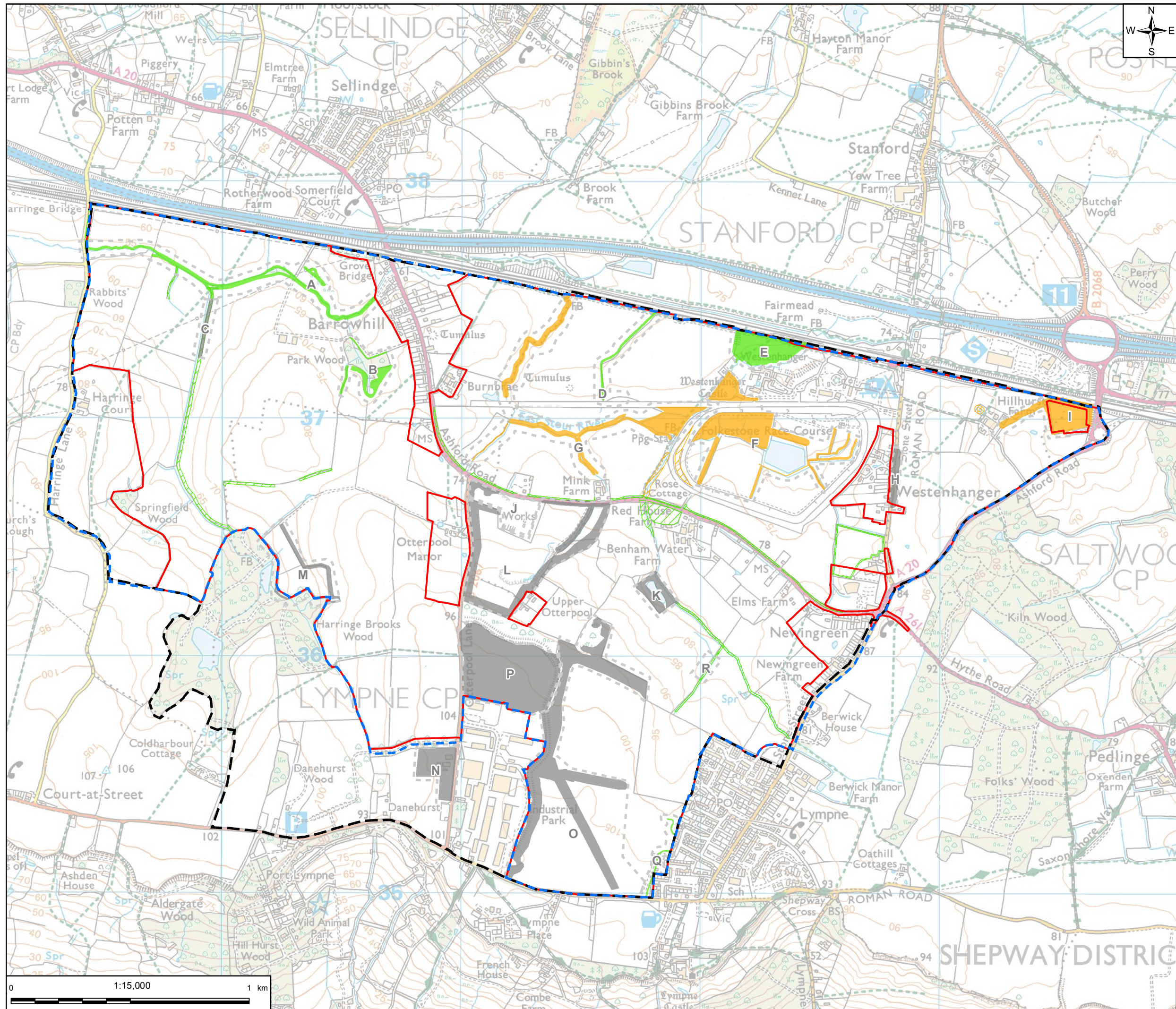
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Figure 7
Reptile Habitats - Surveyed and Inferred

scale	original size	datum	grid
1: 15000	A3	Sx	BNG

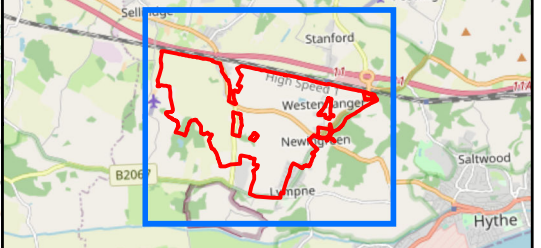
Figure 8: Reptile survey results - population density of slow-worm



Legend

- Study Area
- Outline Planning Application Boundary
- Framework Masterplan Boundary
- Survey Results Area
- Slow Worm Population Density**
 - Good Population
 - Low Population
 - Absent Population
- Slow Worm Population Density Extrapolated**
 - Good Population
 - Low Population

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REV	Date	Description	Drawn	Check	Approv
02	03-03-2022	FOR INFORMATION	PS	BM	MG
01	22-11-2018	FOR INFORMATION	AD	BM	MG

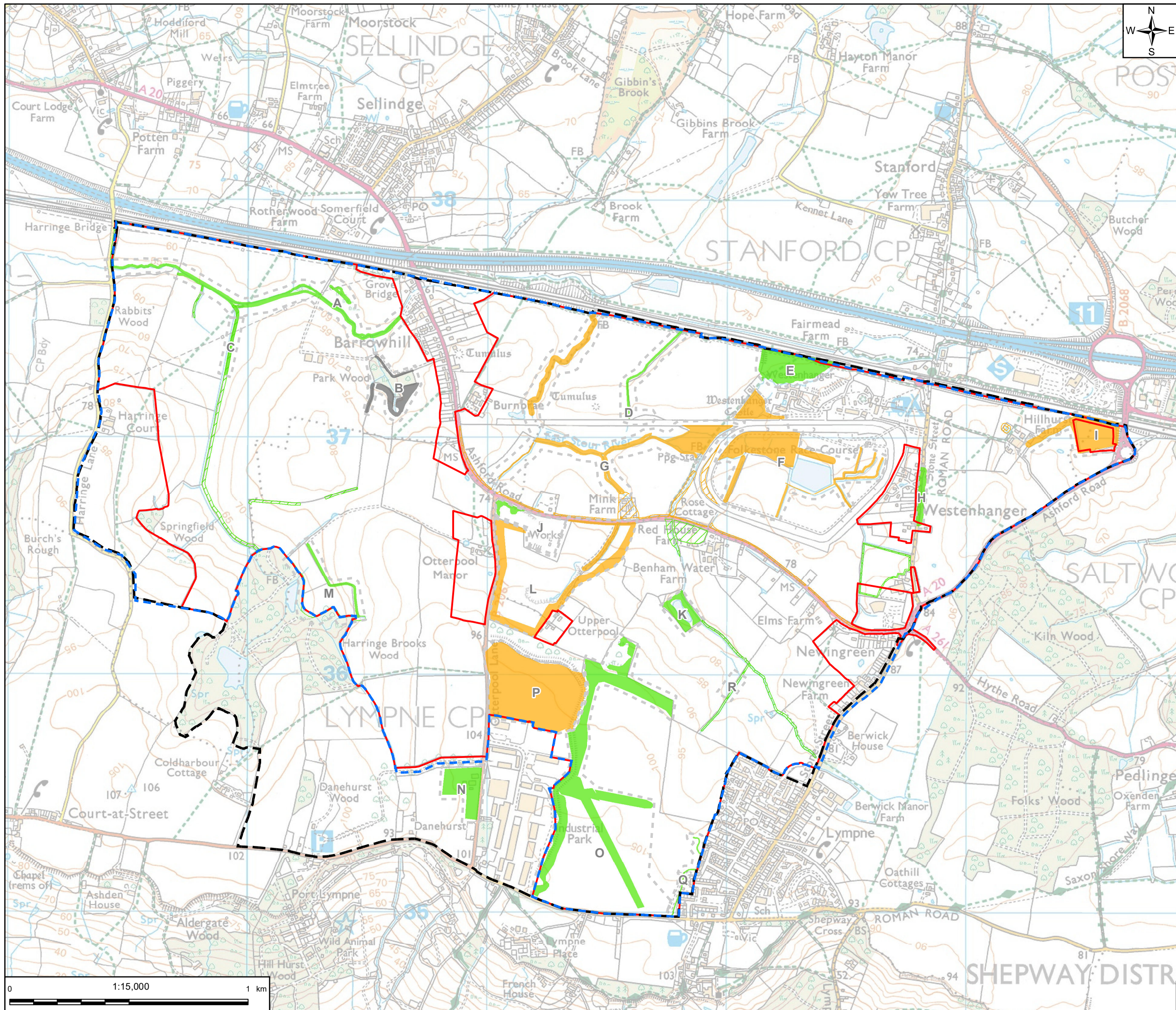
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Figure 8
 Population Density of Slow Worms

scale	original size	datum	grid
1: 15,000	A3	Sx	BNG

Figure 9: Reptile survey results population density of common lizard



Legend

- Study Area
- Outline Planning Application Boundary
- Framework Masterplan Boundary
- Survey Results

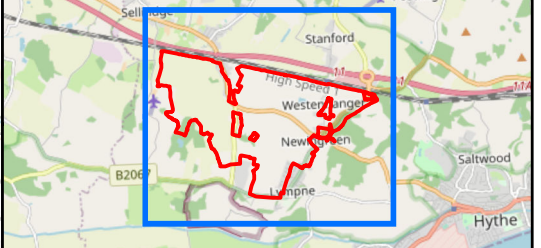
Common Lizard Population Density

- Good Population
- Low Population
- Absent Population

Common Lizard Population Density Extrapolated

- Good Population
- Low Population

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REV	Date	Description	Drawn	Check	Approv
02	03-03-2022	FOR INFORMATION	PS	BM	MG
01	22-11-2018	FOR INFORMATION	AD	BM	MG

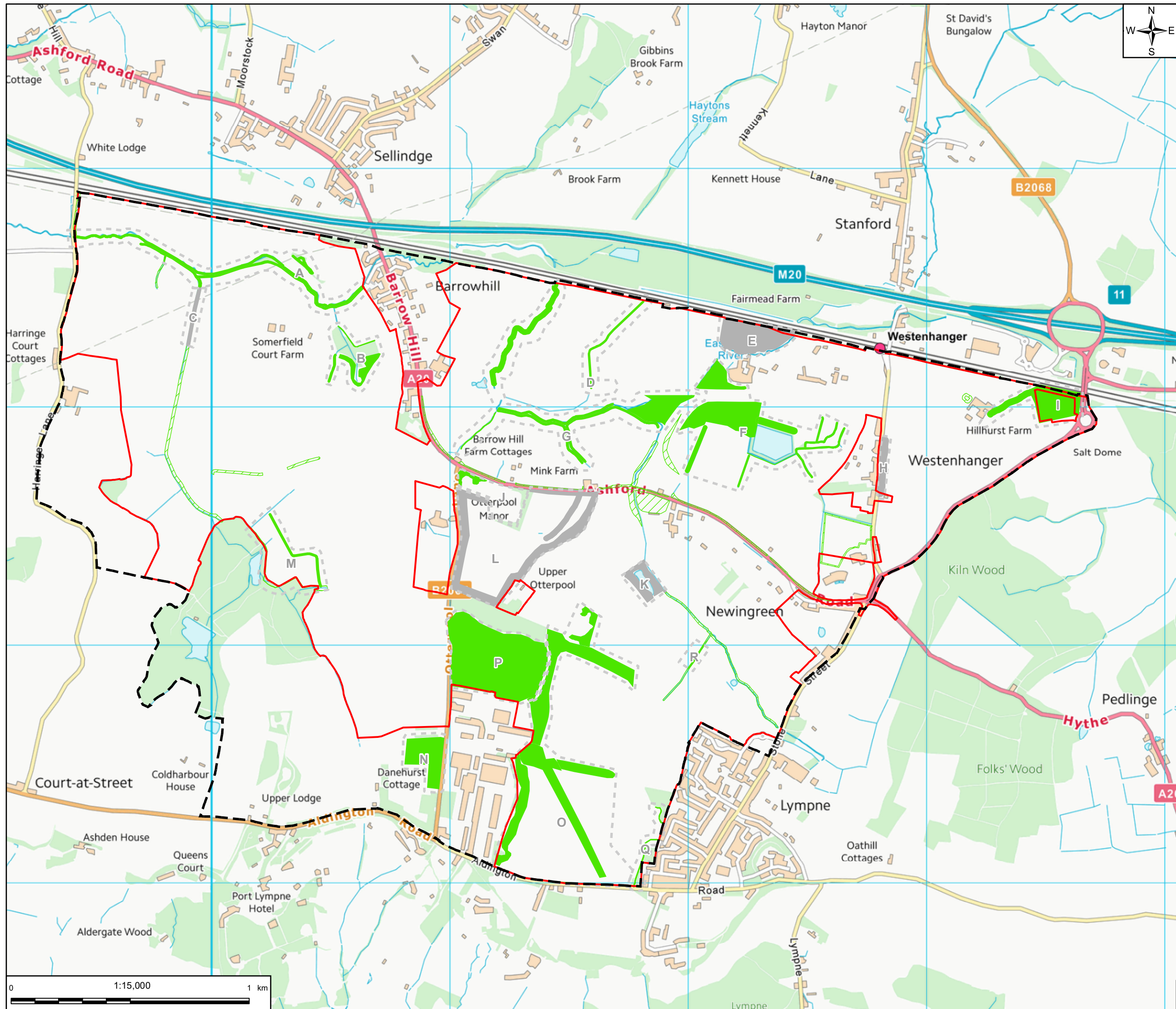
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Figure 9
Population Density of Common Lizards

scale	original size	datum	grid
1: 15,000	A3	Sx	BNG

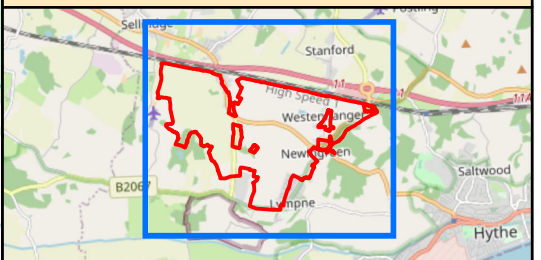
Figure 10: Reptile survey results population density of grass snake



Legend

- Outline Planning Application Boundary
- Framework Masterplan Boundary
- Survey Results Area
- Grass Snake Population Density**
- Low Population
- Absent Population
- Grass Snake Population Density Extrapolated**
- Low Population

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02	03-03-2022	FOR INFORMATION	PS	BM	MG
01	23-11-2018	FOR INFORMATION	AD	BM	MG

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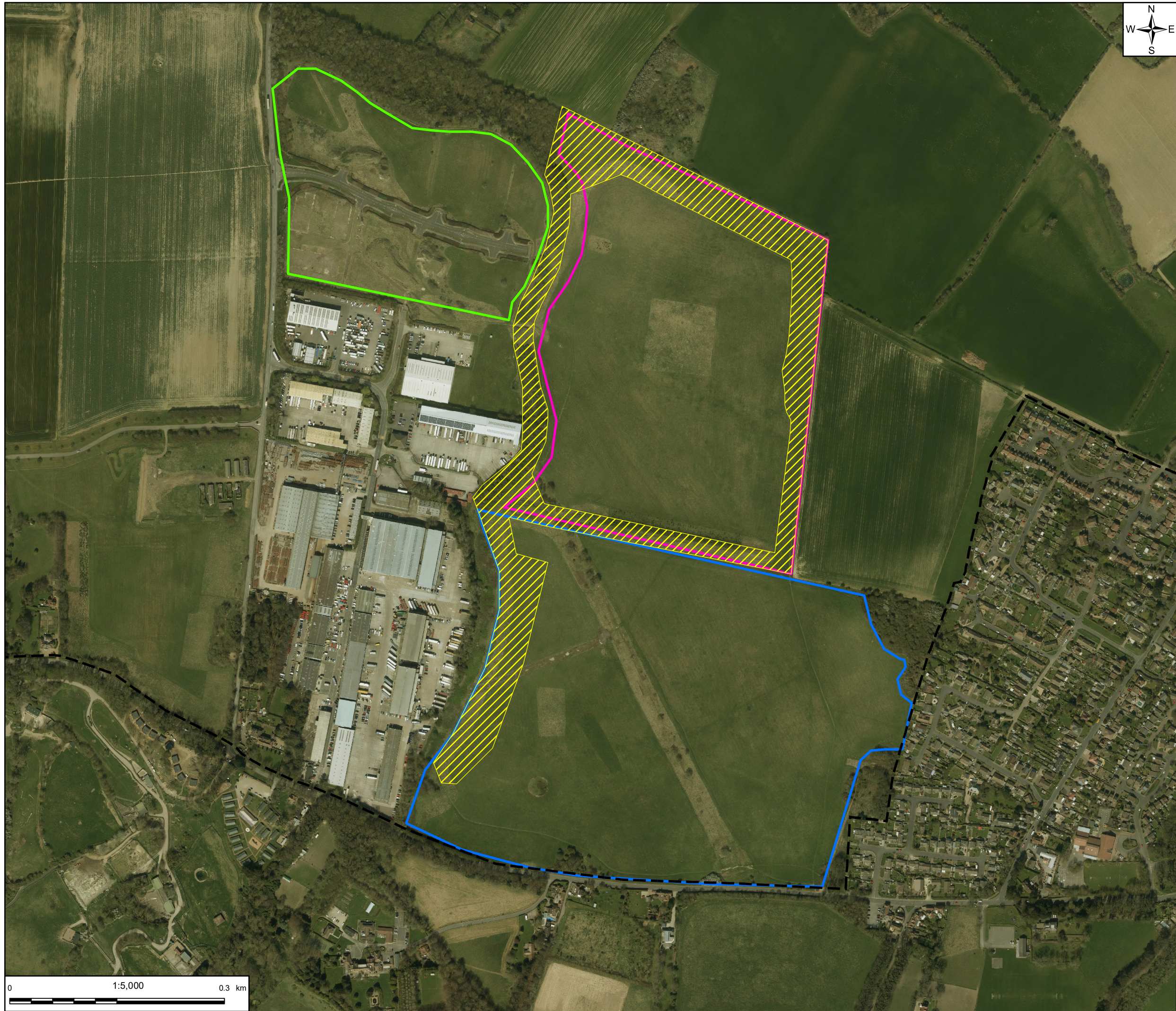
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Figure 10
Population Density of Grass Snakes

scale	original size	datum	grid
1: 15,000	A3	Sx	BNG

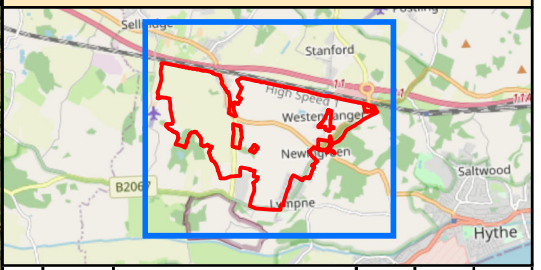
Figure 11: Reptile translocation and mitigation areas from CSa works (Link Park)

All locations are indicative only.



- Legend**
- Framework Masterplan Boundary
 - Phase 1
 - Phase 2
 - Link Park
 - Reptile Receptor

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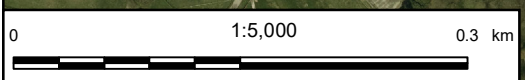


REV	Date	Description	Drawn	Check	Approv
02	03-03-2022	FOR INFORMATION	PS	BM	MG
01	23-11-2018	FOR INFORMATION	AD	BM	MG

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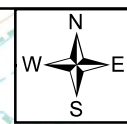
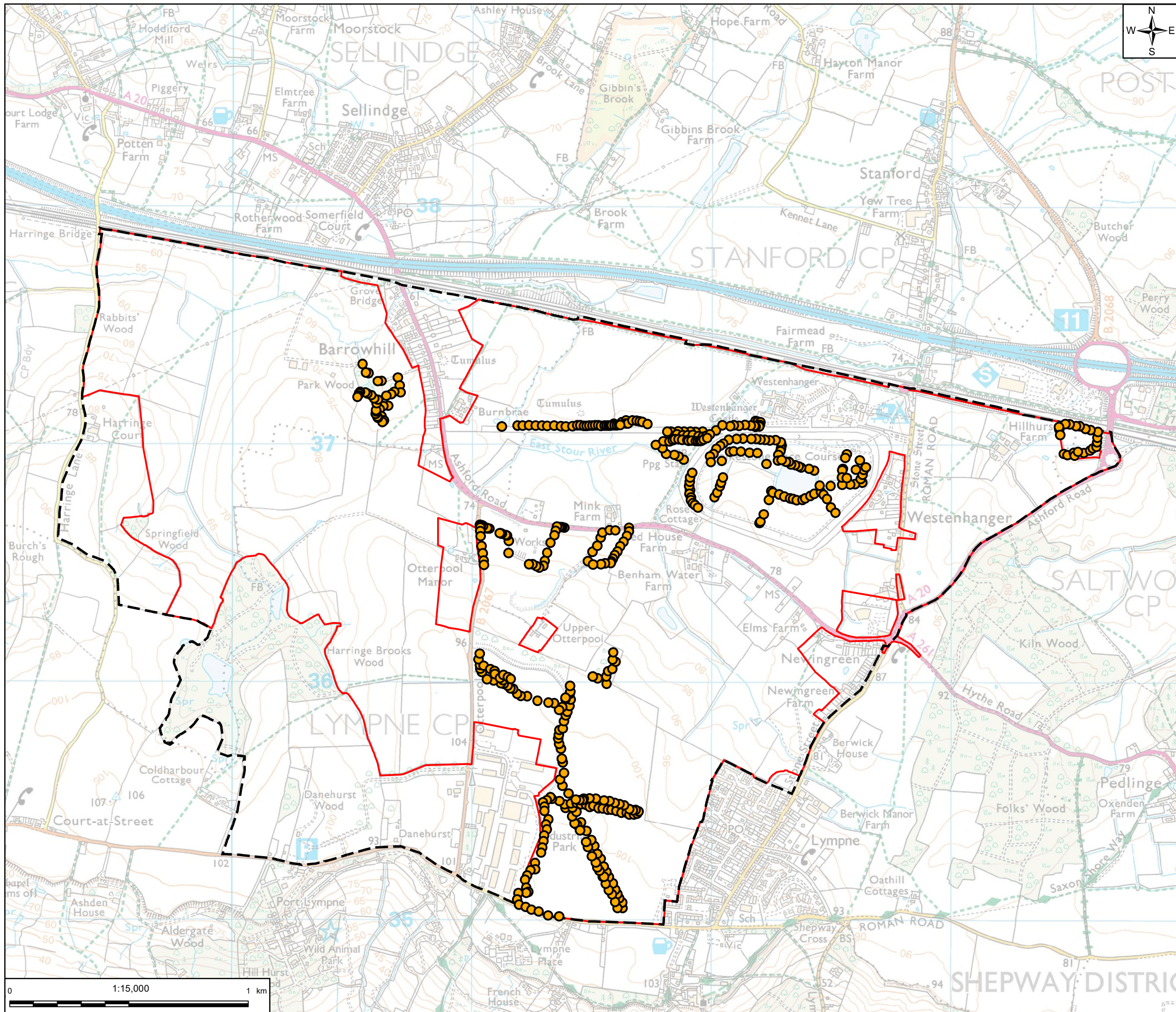
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Figure 11
Translocation and Mitigation Areas
Associated with Link Park
(from CSa Environmental)



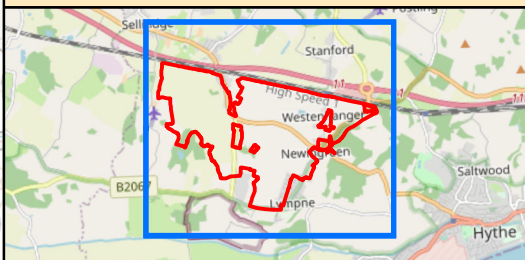
scale	original size	datum	grid
1: 5,000	A3	Sx	BNG

Figure 12: Reptile Survey Results 2021 - Location of Reptile Survey Refugia



- Legend**
- Outline Planning Application Boundary
 - Framework Masterplan Boundary
 - Location of Reptile Survey Refugia

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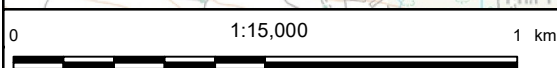


REV	Date	Description	Drawn	Check	Approv
02	03-03-2022	FOR INFORMATION	PS	BM	MG
01	06-07-2021	FOR INFORMATION	PS	BM	MG

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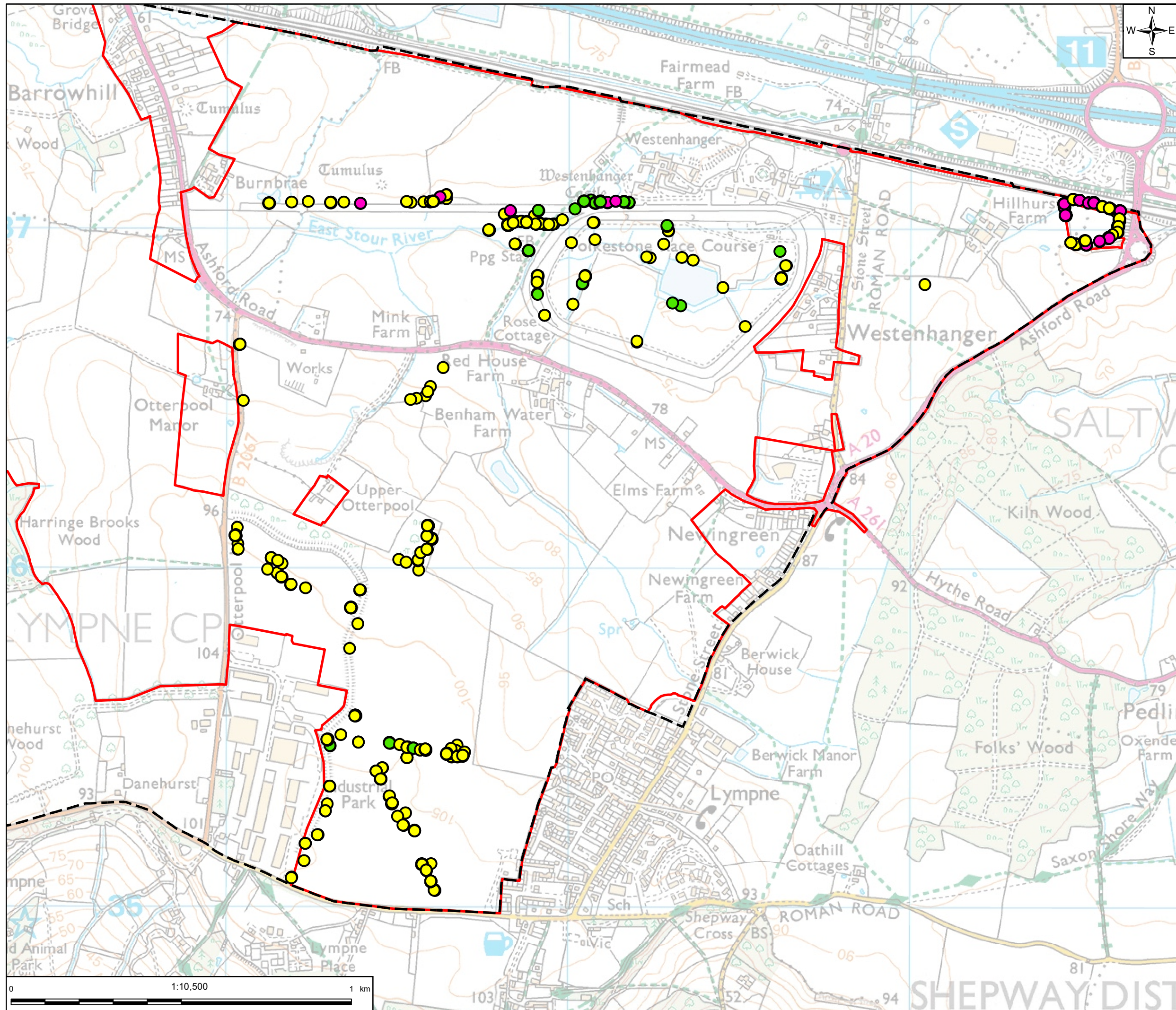

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Figure 12
Reptile Survey Results 2021
Location of Reptile Survey Refugia



scale	original size	datum	grid
1: 15,000	A3	Sx	BNG

Figure 13: Reptile Survey Results 2021 Overview



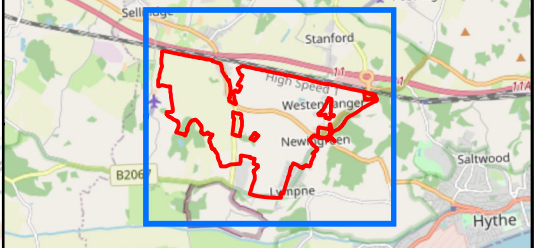
Legend

- Outline Planning Application Boundary
- Framework Masterplan Boundary

Reptile Survey Results

- Common lizard
- Grass snake
- Slow worm

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REV	Date	Description	Drawn	Check	Approv
02	03-03-2022	FOR INFORMATION	PS	EG	BM
01	08-07-2021	FOR INFORMATION	PS	EG	BM

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Figure 13
Reptile Survey Results 2021 Overview

scale	original size	datum	grid
1: 10,500	A3	Sx	BNG

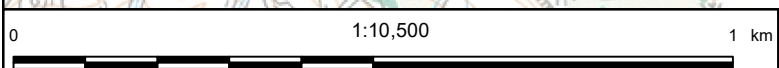
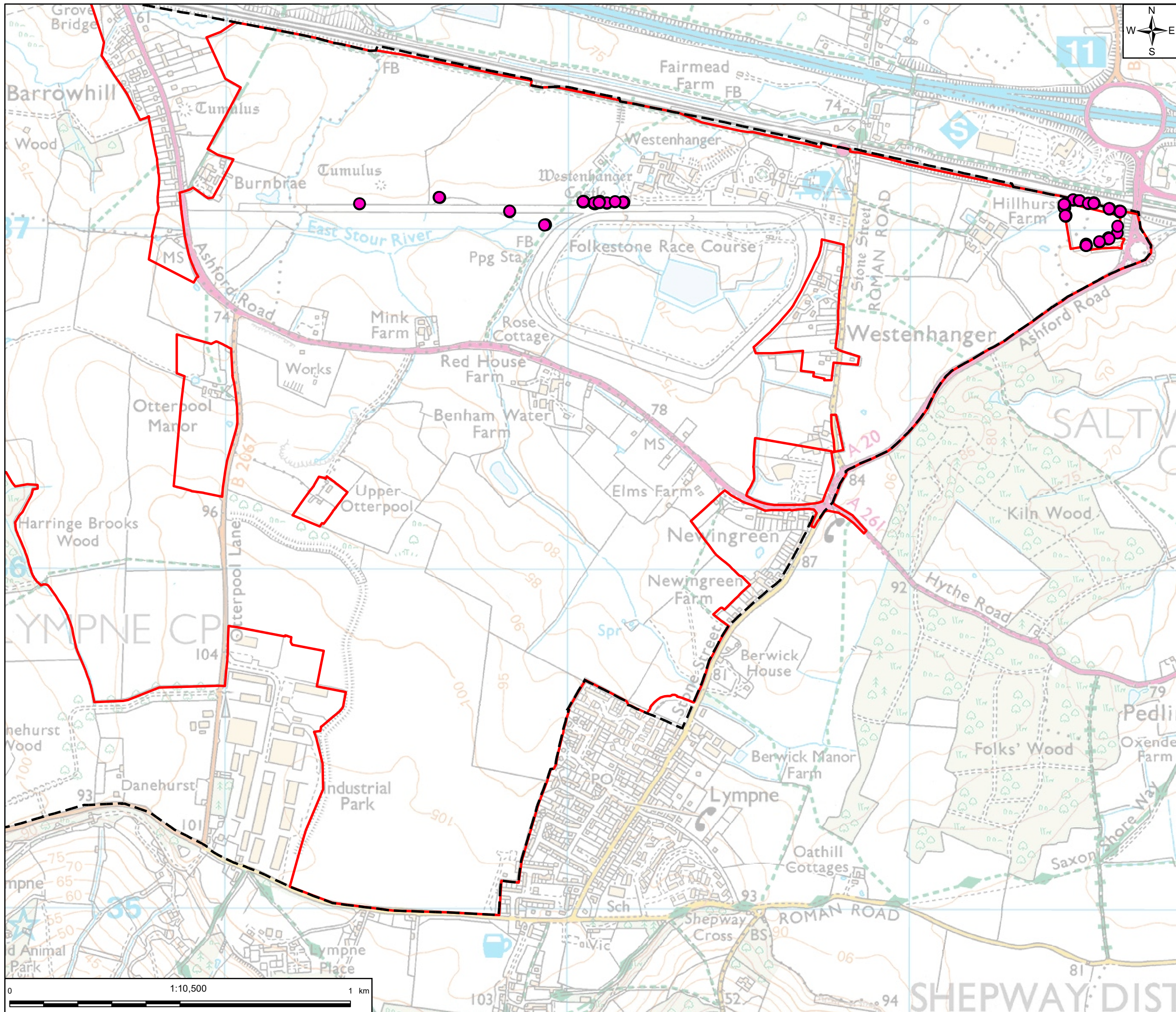


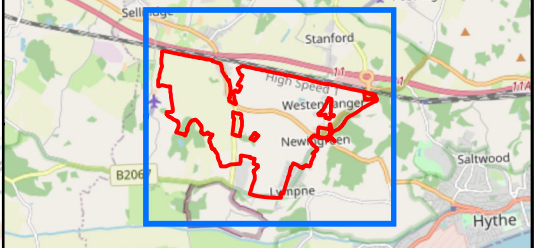
Figure 14: Reptile Survey Results 2021 - Slow Worm



Legend

- Outline Planning Application Boundary
- Framework Masterplan Boundary
- Slow worm

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REV	Date	Description	Drawn	Check	Approv
02	03-03-2022	FOR INFORMATION	PS	EG	BM
01	08-07-2021	FOR INFORMATION	PS	EG	BM

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Figure 14
Reptile Survey Results 2021
Slow Worm

scale	original size	datum	grid
1: 10,500	A3	Sx	BNG

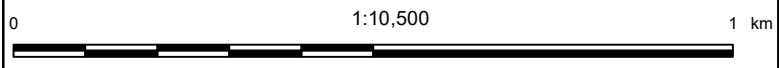
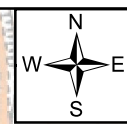
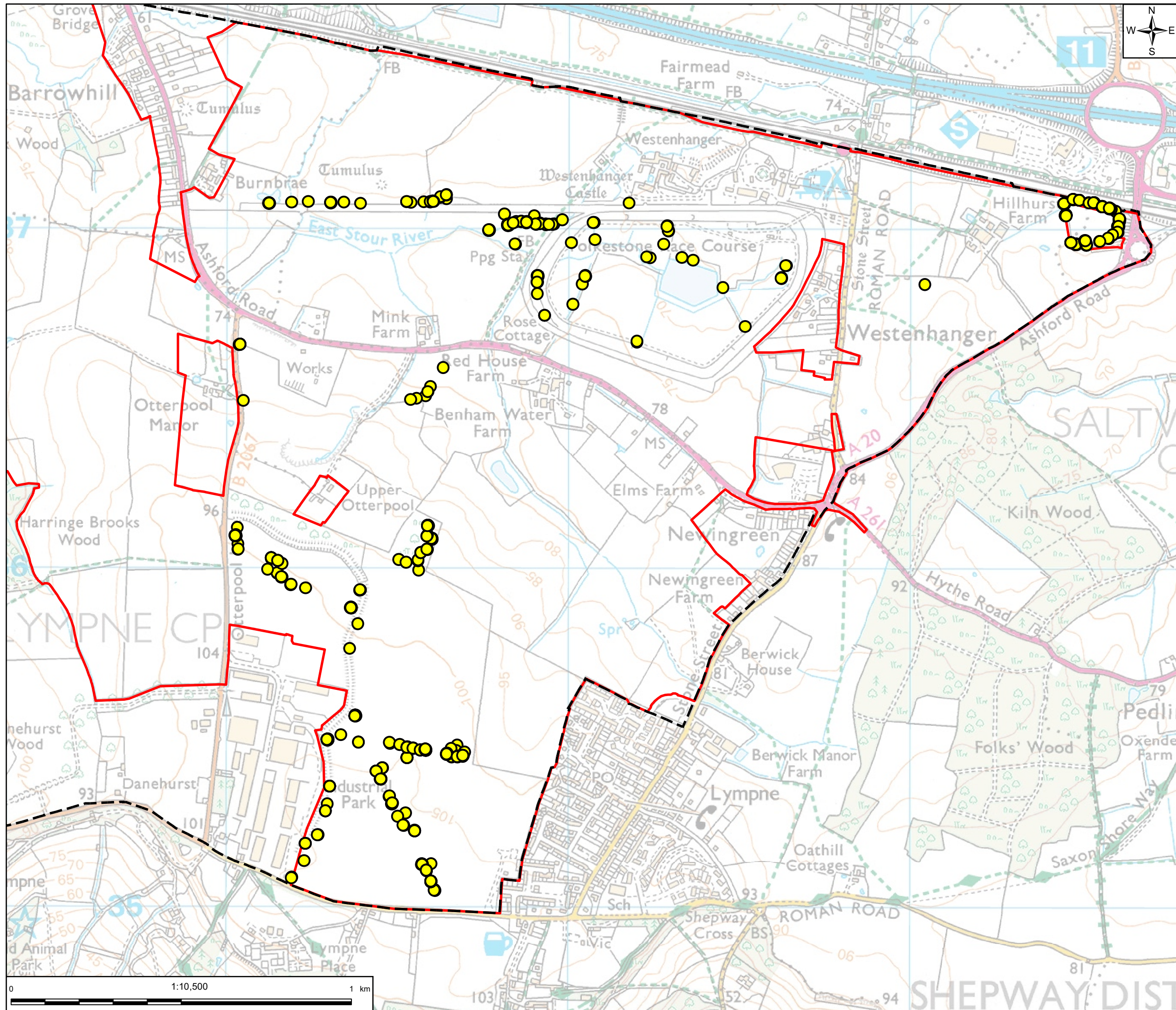


Figure 15: Reptile Survey Results 2021 - Common Lizard



- Legend**
- Outline Planning Application Boundary
 - Framework Masterplan Boundary
 - Common lizard

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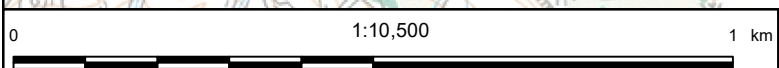


REV	Date	Description	Drawn	Check	Approv
02	03-03-2022	FOR INFORMATION	PS	EG	BM
01	08-07-2021	FOR INFORMATION	PS	EG	BM

ARCADIS
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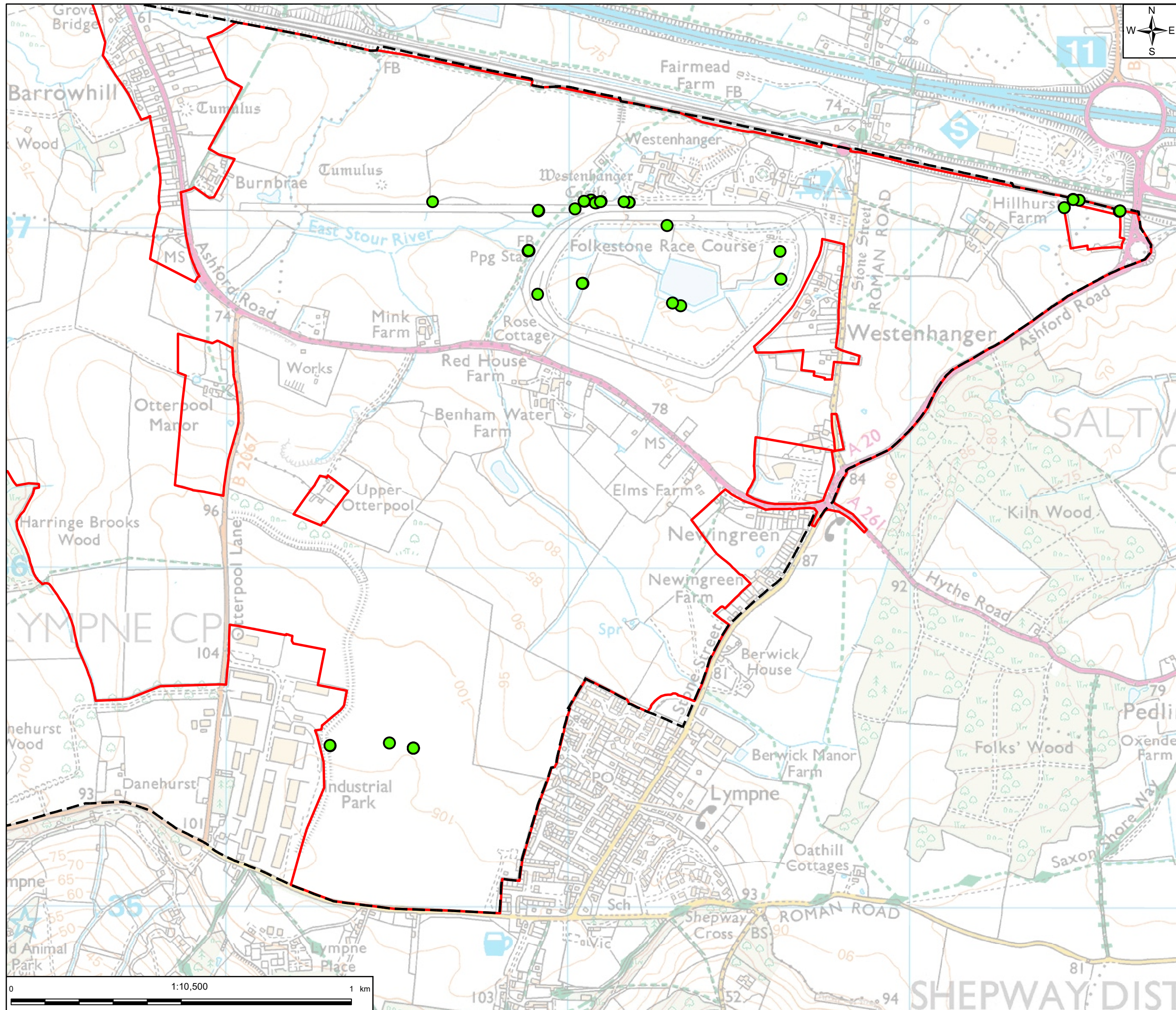

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Figure 15
Reptile Survey Results 2021
Common Lizard



scale	original size	datum	grid
1: 10,500	A3	Sx	BNG

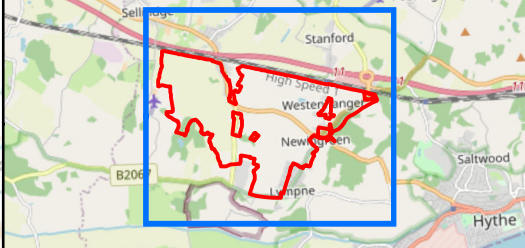
Figure 16: Reptile Survey Results 2021 - Grass Snake



Legend

- Outline Planning Application Boundary
- Framework Masterplan Boundary
- Grass snake

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REV	Date	Description	Drawn	Check	Approv
02	03-03-2022	FOR INFORMATION	PS	EG	BM
01	08-07-2021	FOR INFORMATION	PS	EG	BM

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Figure 16
Reptile Survey Results 2021
Grass Snake

scale	original size	datum	grid
1: 10,500	A3	Sx	BNG

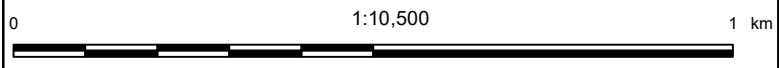
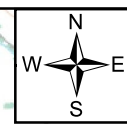
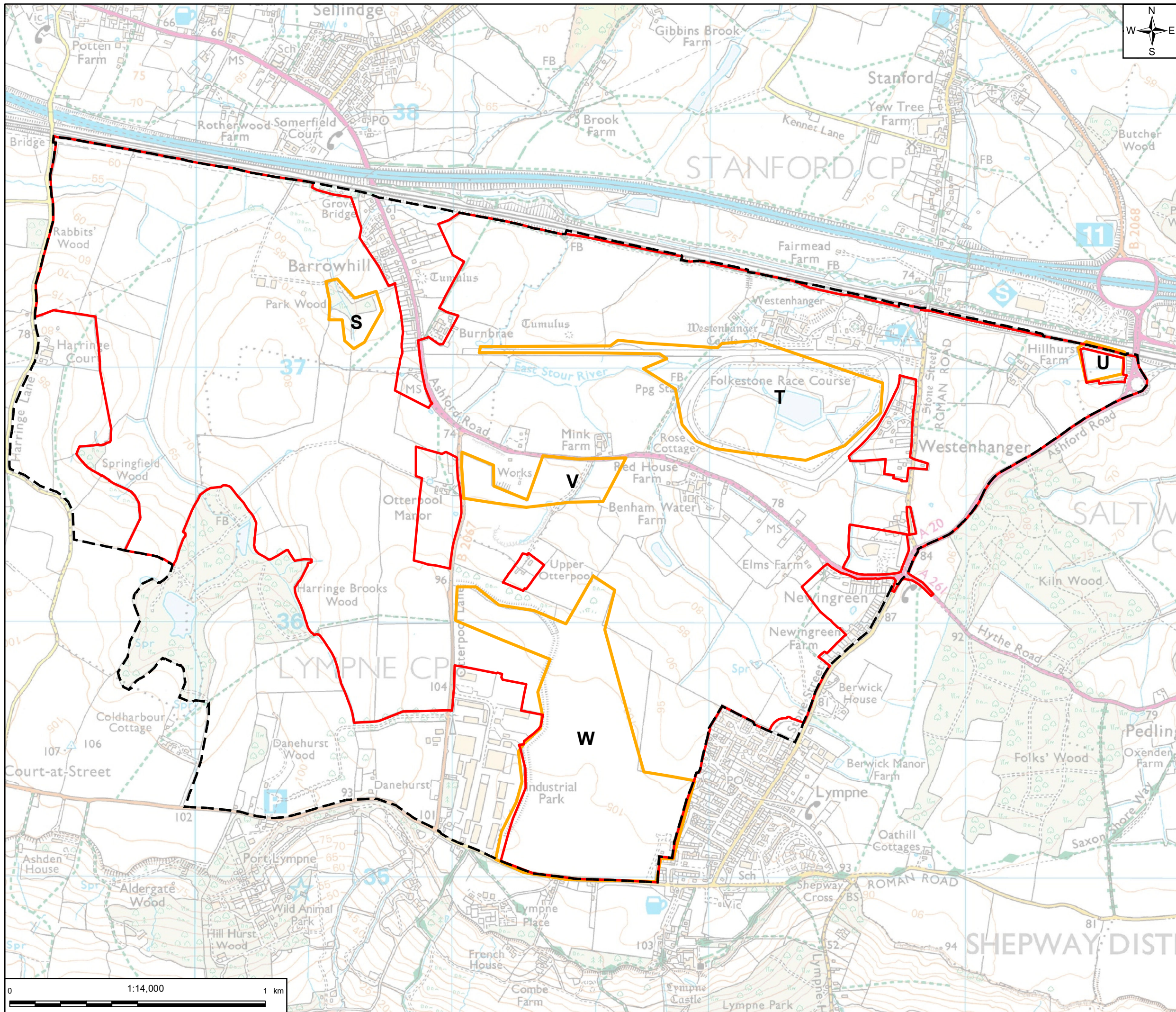
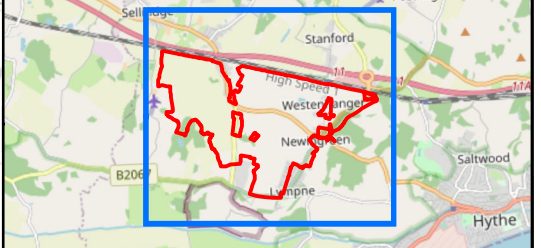


Figure 17: Reptile Survey Results 2021 - Survey Results Area



- Legend**
- Outline Planning Application Boundary
 - Framework Masterplan Boundary
 - 2021 Survey Results Areas

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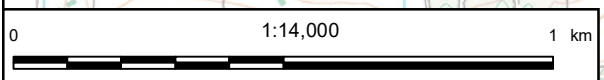


REV	Date	Description	Drawn	Check	Approv
02	03-03-2022	FOR INFORMATION	PS	EG	BM
01	08-07-2021	FOR INFORMATION	PS	EG	BM

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Figure 17
Reptile Survey Results 2021
Survey Results Area



scale	original size	datum	grid
1: 14,000	A3	Sx	BNG

APPENDIX A: Survey data – Arcadis surveys 2017

Table 16: Reptile survey results for Arcadis 2017

Visit no.	Slow-worm						Grass Snake						Common Lizard						Notes
	Adult Male (>230mm)	Adult Female (>230mm)	Unsexed	Juvenile	Neonate	Slow-worm Total	Adult Male	Adult Female	Unsexed	Juvenile	Neonate	Grass Snake total	Adult Male	Adult Female	Unsexed	Imm	Neonate	Common Lizard total	
1	2	2		3		7						1	5	2	2	3		12	1 Juvenile slow-worm found dead at TR1359636971
2	2	3	1	3		9			3	1		4	2	1	2		1	6	
3	7	6	2	8		23			1	2		3	2	2	19			23	
4	1	2		1		4			4	1		5	1		1	1		3	One adult snake skin found at TR1084335596
5	5	4				9			3			3		1	13	2		16	One adult snake skin head found at TR0998437551
6	4	3				7			1	2		3	2	2	5	1		10	
7	2	6		2		10				1		1	1		3	6		10	
8	7	2				9			2	5		7	1	2	8	10		21	One adult snake skin head found at TR1221336662
9	5	4		3	1	13		1		2	2	5	6	4	4	10	12	36	
10	4	6	1	1	2	14	1		1	2	1	5	1	8	2	7	19	37	
Incidental									1			1							

Table 17 Survey Data Per Visit (CSa Surveys)

Visit no.	Date	Slow-worm					Common Lizard						Grass snake					
		Adult Male (>230mm)	Adult Female	Imm	Newborn	Slow-worm Total	Adult Male	Adult Female	Unsexed	Imm	Newborn	Common Lizard	Adult Male	Adult Female	Unsexed	Imm	Newborn	Grass snake Total
1	19/04/2017	0	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	0
2	16/05/2017	1	0	0	0	1	7	10	11	2	0	30	1	0	0	1	0	2
3	01/06/2017	0	0	0	0	0	2	2	3	0	0	7	1	0	1	0	0	2
4	19/06/2017	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	1
5	01/07/2017	1	0	0	1	2	4	11	3	3	0	21	1	0	0	0	0	1
6	11/07/2017	0	1	0	0	1	6	8	15	8	0	37	1	0	0	0	0	1
7	14/07/2017	1	1	0	0	2	7	3	6	0	2	18	0	0	1	1	0	2
8	25/07/2017	0	0	0	0	0	4	9	6	1	13	33	0	0	0	0	0	0
9	01/08/2017	0	1	1	0	2	2	1	4	1	4	12	0	0	1	0	0	1
10	11/08/2017	0	1	0	0	1	6	7	4	14	8	39	1	0	0	0	0	1

APPENDIX B: Weather data – Arcadis surveys 2017

Table 18: Weather during Arcadis surveys 2017 (excluding lorry park)

Survey Component	Visit number	1	2	3	4	5	6	7	8	9	10
	Date	17/05/2017	01/06/2017	08/06/2017	13/06/2017	31/08/2017	04/09/2017	06/09/2017	07/09/2017	25/09/2017	27/09/2017
Part 1	Surveyor	Ewan Gibson	Ellen Poppleton	Ewan Gibson & Ellen Poppleton	Ewan Gibson	Ewan Gibson & Alistair Walker	Hannah Tracey	Hannah Tracey	Hannah Tracey	Alistair Walker	Alistair Walker
	Start time	12:20	08:00	09:50	08:30	07:00	11:00	08:15	08:00	11:30	09:00
	Finish time	18:00	20:30	18:00	16:30	13:00	16:00	17:00	18:20	16:40	17:05
	Start Temp (°C)	17	14	15	16	10	17	13	16	15	12
	Max Temp (°C)	21.5	18	20	21.5	19	19	20	18	20	16
	Wind direction	SE	SE	W	S	SW	S	SW	SW	NW	SE
	Wind speed	Light	Light	Strong (up to 40mph)	Light	Light	Light	Light	Light	Light	Light
	Cloud cover	4	1	4	4	6	8	8	8	7	5
	Rain	None	None	None	None	None	None	Dry	None	None	None
Part 2	Date	19/05/2017	02/06/2017		21/07/2017		05/09/2017		08/09/2017	26/09/2017	28/09/2017
	Surveyor	Ewan Gibson	Ewan Gibson		Ewan Gibson		Hannah Tracey		Hannah Tracey	Alistair Walker	Alistair Walker
	Start time	08:20	05:50		09:30		08:30		07:10	11:00	09:30

Survey Component	Visit number	1	2	3	4	5	6	7	8	9	10
	Finish time	14:00	09:30		14:30		15:15		09:00	15:15	11:30
	Start Temp (°C)	9	13		17		15		15	16	14
	Max Temp (°C)	11.5	21		20		18		16	18	14
	Wind direction	SW	SE		SE		SW		SW	E	SE
	Wind speed	Light	Light		Light		Light		Light	Light	Light
	Cloud cover	8	2		6		8		8	8	4
	Rain	None/Light	None		None		Light		Light	None	Light
Part 3	Date	22/05/2017							12/09/2017		
	Surveyor	Ellen Poppleton							Ewan Gibson		
	Start time	10:00							08:00		
	Finish time	11:00							14:00		
	Start Temp (°C)	14							17		
	Max Temp (°C)	17							17		
	Wind direction	E							W		

Survey Component	Visit number	1	2	3	4	5	6	7	8	9	10
	Wind speed	Light							Light		
	Cloud cover	8							4		
	Rain	None							None		

Table 19: Weather during Arcadis surveys 2017 (lorry park)

Visit Number	1	2	3	4	5	6	7
Date	12/09/2017	20/09/2017	21/09/2017	25/09/2017	27/09/2017	28/09/2017	02/11/2017
Surveyor	Ewan Gibson	Ewan Gibson & Alistair Walker	Ewan Gibson & Alistair Walker	Alistair Walker	Alistair Walker	Alistair Walker	Ewan Gibson
Start time	10:00	16:45	18:00	13:45	13:00	11:50	12:00
Finish time	10:30	17:15	18:22	14:10	13:30	12:13	12:30
Start Temp (°C)	17	16	17	18	18	15	13
Max Temp (°C)	17	16	17	18	18	15	13
Wind direction	SW	SW	0	0	0	S	SW
Wind speed	Light	Light	None	None	None	Light	Light
Cloud cover	4	8	8	7	5	5	6
Rain	None	None	None	None	None	None	None

APPENDIX C: Weather data – CSa surveys 2017

Table 20: Weather during CSa surveys 2017

Survey Number	1	2	3	4	5	6	7	8	9	10
Date	19/04/2017	16/05/2017	01/06/2017	19/06/2017	01/07/2017	11/07/2017	14/07/2017	25/07/2017	01/08/2017	11/08/2017
Surveyor	Martin Sutherland	Martin Sutherland and Aaron White	Martin Sutherland	Martin Sutherland	Martin Sutherland	Martin Sutherland	Hannah Willis and Aaron White	Jessica Tait	Jessica Tait and Aaron White	Jessica Tait and Alexandria Shaw
Start Time	07:00	07:00	07:00	06:00	06:00	11:00	08:00	10:30	08:30	10:00
End Time	11:00	11:00	12:00	11:00	11:30	15:00	11:00	15:00	11:30	13:00
Min Temp (°C)	0	14	12	18	13	20	17	17	18	20
Max Temp (°C)	9	17	18	23	16	22	17	19	18	20
Wind speed	Light breeze	Light breeze	Light air	Calm	Gentle breeze	Light air	Gentle breeze	Gentle breeze	Moderate breeze	Light air
Cloud cover	0	8	0	0	8	2	7	7	5	2
Rain	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Light rain shower	Dry	Dry

APPENDIX D: Weather data – Arcadis surveys 2021

Table 21: Weather during Arcadis surveys 2021.

Survey Number	1	2	3	4	5	6	7
Date	13/04/2021	19/04/2021	27/04/2021	06/05/2021	10/05/2021	20/05/2021	26/05/2021
Surveyor (Babec Ltd.)	Alex Burrows & Alex Matthams	Tim Buckland, Alex Burrows, Agnes Rutter & Alex Matthams	Alex Burrows & Shaun Pryor	Alex Burrows & Tim Buckland	Alex Burrows & Tim Buckland	AR, Alex Burrows & Tim Buckland	Alex Burrows, Tim Buckland & Shaun Pryor
Start Time	11:00	11:45	11:15	09:30	08:55	08:10	09:50
End Time	16:20	16:10	17:20	15:45	13:25	14:55	15:00
Min Temp (°C)	9.1	12	12.6	5.8	12.4	10.1	13.2
Max Temp (°C)	16.2	15.2	14.2	13.3	16.8	15.2	14.9
Wind speed	1 - 3	0 - 2	1 - 3	1 - 3	2 - 6	0 - 3	0-1
Cloud cover	2 - 7	0	1	5 - 8	3 - 8	2 - 8	4 - 7
Rain	None	None	None	Brief heavy rain and hail shower	None	Brief light rain shower	None

APPENDIX E: Photographs



Photograph 1: Common lizard found incidentally at OS Grid Reference TR117373.



Photograph 2: Grass snake found under a corrugated metal sheet neighbouring ex-military bunkers at OS Grid Reference TR109355.



Photograph 3: One juvenile grass snake found within Park Wood (adjacent to Somerville Court Farm) at OS Grid Reference TR106372.



Photograph 4: Grass snake observed adjacent to the racecourse lake.

APPENDIX F: Pen portraits of Arcadis surveyors (2018-2021)

Surveyor	CV details
<p>Alex Ward, (Environmental Consultant) BSc (Hons) Affiliate IEMA (2018)</p>	<p>Alex is a graduate environmental consultant who predominately involved as the environment lead on a coastal defence construction scheme for the Environment Agency. This has led him to be experienced in the delivery of environmental mitigation, ecological surveying and national and international permitting requirements. Alex has received training in regards to the identification of both reptiles and bats during his time at Arcadis, including the usage of survey equipment.</p>
<p>Brandon Murray (Principal Ecological Consultant) BSc(hons) MCIEEM (2018)</p>	<p><i>Brandon has been a professional ecologist for over eight years and has been surveying reptiles and designing appropriate mitigation for reptiles for eight years.</i></p>
<p>Ellen Poppleton, (Assistant Ecologist) BSc (hons) GradCIEEM (2018)</p>	<p>Ellen Poppleton has been an ecologist for over two years. She has experience surveying for reptiles, bats, badgers, amphibians and water voles. Ellen has received internal and on the job training to ensure that she can confidently conduct a range of protected species surveys.</p>
<p>Ewan Gibson, (Assistant Ecologist) BSc (hons) GradCIEEM (2015)</p>	<p>"Ewan Gibson is a graduate ecologist with a broad range of ecological experience. Ewan has been a professional ecologist for 3 years and has conducted surveys for a range of species, including bats, badger, dormouse, amphibians and reptiles, as well as being licensed to survey for barn owl. Ewan strives to collect and collate data with accuracy and precision. He has received in-house 'on the job' training in order to understand the requirements of these surveys, including the usage of survey equipment and identification of field signs."</p>
<p>Hannah Tracey, MCIEEM BSc(hons) MSc (hons) (2018)</p>	<p>Hannah has worked as a professional Ecologist with Arcadis for over four years. During this time, she has developed a wide range of experience in both the field and office-based environment.</p> <p>Hannah regularly undertakes targeted surveys for a range of protected species including great crested newt, dormouse, reptile, badger and bat activity and emergence/re-entry surveys. She has experience of undertaking site supervision activities and ecological clerk of works.</p>



Arcadis (UK) Limited
80 Fenchurch Street
London
United Kingdom

T: +44 (0) 20 7812 2000

arcadis.com

