Oxfordshire Highways

Cogges Link Road
Reptile Surveys

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Reptile Surveys

Executive Summary

- Surveys have been undertaken with the aim of identifying the magnitude and significance of impact of the Cogges Link Road (CLR) on reptiles.
- A reptile survey was undertaken in autumn 2002, however no reptiles were found. It was considered that this was possibly due to adverse weather conditions, and a repeat survey was carried out during more suitable weather conditions in spring 2003.
- The 2003 survey found the presence of grass snakes in two of the survey areas – Area 2 adjacent to the River Windrush and Area 5 between the western channel of the River Windrush and Witan Way.
- It is therefore considered that there is a breeding population of grass snakes associated with the Witney Lakes and Meadows Country Park, and that this is of parish importance.
- Potential impacts of the CLR include direct mortality, habitat loss and severance.
- Mitigation measures include vegetation clearance to render habitats unsuitable for reptiles, temporary reptile exclusion fencing and creation of new areas of reptile habitat on the new south facing roadside verges.
- Assuming appropriate mitigation is carried out, all residual impacts will become minor or negligible, and there is the potential for long term benefit.

Contents

1 Introduction

1.1 Background

1.1.1 Oxfordshire Highways has commissioned an investigation into the potential ecological impacts on protected species and habitats of the proposed Cogges Link Road (CLR). The proposed new road runs south eastwards from the roundabout in Witan Way, Witney, crossing the northern part of the Witney Lakes and Meadows Country Park and the River Windrush. It runs parallel to the A40 south of Cogges and then immediately east of Cogges the road runs northwards, linking with Oxford Hill (see Figure 1).

1.1.2 Reptile surveys were carried out in 2002 and 2003.

1.2 Reptile Ecology and Legislation

1.2.1 There are six British species of reptiles, comprised of three snake species, grass snake *Natrix natrix*, smooth snake *Coronella austriaca* and adder *Vipera berus*, and three lizard species, common lizard *Lacerta vivipara*, sand lizard *Lacerta agilis* and slow worm *Anguis fragilis*, a legless lizard. In addition there are a few introduced species, which may be encountered occasionally, arising from escapes or illegal releases.

1.2.2 Most species of British reptiles give birth to live young with the exception of the sand lizard and grass snake, which lay eggs. Reptiles have a variable body temperature which depends on the surrounding temperature and their behaviour. Reptiles move to open areas in order to bask in the sun and once a favourable temperature is reached they move off to forage.

1.2.3 Depending on the species' dietary needs, the habitats required may include areas of coarse grassland, scrub, woodland, or wetland areas. Generally, lizards feed on invertebrates such as insects, and snakes feed on vertebrates, such as amphibians and small mammals. Reptiles also require well vegetated areas, piles of rubble and logs for shelter and hibernacula. Suitable habitats will allow the reptiles access to breeding, feeding and hibernating areas.

1.2.4 Smooth snakes are the UK's rarest reptile and sand lizards are the UK's most threatened reptile. The sand lizard and smooth snake are fully protected under Schedule 5 of the Wildlife & Countryside Act 1981, as amended (WCA). Smooth snakes occur almost exclusively on lowland dry heathland in the southern counties of England, namely Dorset, Hampshire, Surrey and West Sussex. Sand lizards are very specialised in their habitat requirements, and occur only on lowland sandy heathland in areas of Dorset, Hampshire, West Sussex and Surrey, and in Merseyside on coastal dunes densely vegetated with marram grass *Ammophila arenaria*. As such these species are very unlikely to be present within the proposed development site.

1.2.5 The commoner and more widespread British reptiles, ie grass snake, common lizard, slow worm and adder are included on Schedule 5 of the Wildlife and

Countryside Act (1981) receiving protection from killing, injury and sale only.

1.2.6 The UK Biodiversity Action Plan (BAP) Species and Habitat Review 2007 resulted in, amongst other species, common lizard, slow worms, grass snake and adder being added to the list of UK BAP species.

1.3 Purpose of this report

1.3.1 This report summarises the results of two reptile surveys that were undertaken in autumn 2002 and spring 2003.

1.3.2 The aims of the surveys were to:

- Establish whether any areas of potential reptile habitat support reptiles.
- Assess the importance of any reptile populations found for nature conservation.
- Establish whether any areas that support reptiles will be affected by the Scheme, and if so, to provide recommendations for appropriate mitigation measures.

2 Methodology

2.1 **Background**

2.1.1 Desktop survey information was requested from Thames Valley Environmental Records Centre (TVERC).

2.1.2 The Phase 1 Habitat Survey for the CLR suggested that parts of the proposed route may be suitable for reptiles. In addition, a notice board in the Witney Lakes and Meadows Country Park mentions grass snakes as being present.

2.1.3 A walkover survey was undertaken on 9 September 2002, a few days prior to the commencement of the first reptile survey, to identify areas suitable for reptiles within 100m of the proposed road route. The areas not considered suitable for reptiles were short mown/grazed grassland and arable fields.

2.1.4 Six areas considered to have the potential to support reptiles were identified and were surveyed in 2002.

2.1.5 All areas surveyed for reptile presence in autumn 2002 were re-surveyed in early 2003. In addition, an area of coarse grassland and bramble scrub, adjacent to the northern verge of the A40 (Area 7) was surveyed for the presence of reptiles. The survey areas are described below and are shown on Figure 1.

2.1.6 Area 1 is an area of semi-improved long grassland, approximately 1.52ha.

2.1.7 Area 2 is an arable field margin comprising of tall ruderal and coarse grassland, adjacent to the River Windrush. This area previously offered a larger area suitable to support reptiles but had recently been cut. However, the interface between the mown field and the tall ruderals and coarse grassland of the river bank remained as good habitat for reptiles with an area for survey of approximately 0.88ha.

2.1.8 Area 3 is an area of coarse wet grassland adjacent to a reed bed (SW1) with an approximate area of 0.14ha. Previously, a much larger area would have been suitable for reptiles, as at the time of the Phase 1 Habitat Survey, Area 3 was all long grassland. During the second walkover, this field was observed to have been recently mown. Area 3 lies just inside the Witney Lakes and Meadows Country Park.

2.1.9 Areas 4 and 5 are small areas of coarse grassland situated between the channel off the western fork of the River Windrush and Witan Way. Area 4, the northern most of the two areas has an approximate area of 50m^2 and Area 5 has an area of approximately 25m^2.

2.10 Area 6 is an area of coarse grassland with encroaching bramble scrub with an approximate area of 0.12ha. Although within 100m of the CLR, Area 6 was not surveyed during either 2002 or 2003 because it is located south of the A40, and will not be affected by the CLR.

2.1.11 Area 7 is an area of coarse grassland with encroaching bramble scrub. Located along the margin of an arable field with an approximate area of 0.12ha.

2.2 Specific Reptile Survey Methods

2.2.1 Two survey methods were used to determine the presence or possible absence of reptiles. These were an artificial refugia search and a visual search. Both methods were applied on seven separate days.

2.2.2 In 2002, both methods were conducted approximately at midday (the warmest part of the day) due to the survey being conducted at the end of the season. In 2003 however, warmer conditions meant that they were conducted during mid-morning, in order to maximise the likelihood of reptiles using the artificial refugia to reach their optimum temperature. The two methods are detailed below:

2.3 Refugia Search

2.3.1 A number of artificial refugia were placed in suitable locations throughout the survey area, giving an approximate density of 50 tins per hectare. The refugia were a mixture of reptile tins (50cm x 50cm cuts of corrugated tin that were painted black on one side) and similar sized piece of roofing felt. They were placed dark-side-up and positioned so that they were in contact with the ground and exposed to sunlight. The refugia are a reliable way of determining the presence of reptiles on a site provided there is a reasonably sized population present, thus increasing the chance of the individual reptiles finding the refugia.

2.3.2 The dark side absorbs the sunlight and warms more quickly and cools more slowly than the surrounding substrate. This enables a reptile under the refugia to achieve a favourable body temperature faster than usual and thus it can start foraging earlier and for longer in the day. Once the reptile has found a tin it will usually use it as part of its daily routine.

2.4 2002 Survey

2.4.1 The tins were placed on 23 September 2002 and then checked seven times, on 30 September, 9, 17 and 23 of October and 6, 8 and 13 of November 2002. All seven visits were undertaken at approximately mid day. Four of the visits were undertaken during suitable weather conditions but due to the turn of the weather the last three visits were undertaken in sub-optimal conditions. The survey conditions are given in Table 1.

Table 1: Reptile Survey Conditions 2002

Visit No.	1	2	3	4	5	6	7*
Date	30-9-02	9-10-02	17-10-02	23-10-02	6-11-02	8-11-02	13-11-02
Time	12-2pm	12.45-2.45pm	1.30-3.30pm	1-3pm	11-1pm	11-1pm	11.30-1.30pm
Weather	sunny	sunny breeze	bright & sunny	sunny	damp dull	damp dull	damp dull
Temperature under tin ^{o}C	19	15 - 18	15 - 18	15	10	10	9

***** All areas were surveyed, except area 3 because cattle had trampled the tins and these were removed from the field after visit 6.

2.4.2 The tins were collected up and removed from the site as soon as possible after the end of the survey.

2.5 2003 Survey

2.5.1 The tins were placed on the 20 May 2003 and then checked seven times. The survey conditions and dates of each survey visit are given in Table 2.

Table 2: Reptile Survey Conditions 2003

Visit No.	1	2	3	4	5	6	7
Date	28/5/03	30/05/03	06/06/03	13/06/03	20/06/03	26/06/03	01/07/03
Time	8.30 – 10.30am	9.00 – 10.30am	8.30 – 10.30am	8.00 – 10.00am	8.30 – 10.30am	9.00 – 11.00am	8.30 – 11.30am
Weather	Sunny	Sunny breeze	Bright & sunny	Sunny	Sunny	Overcast/ Sunny	Overcast/ Sunny
Av.Temperature under tin ^{o}C	18	18	20	19	22	21	21

2.5.2 The tins were collected up and removed from the site on the 1 July 2003, once the seventh survey visit was complete.

2.6 Visual Search

2.6.1 The aim of the visual search is to find reptiles basking without disturbing them so that an accurate identification can be made. This involved slowly walking around Areas 1 – 5 and 7 during suitable weather conditions, i.e. during intermittent or hazy sunshine, or during suitable temperatures, between 10 and 18^{o}C.

2.6.2 A visual search for reptiles was undertaken on seven separate days each year, whilst conducting the refugia searches.

3 Findings

3.1 Desktop Study

3.1.1 Environmental records from TVERC included records for grass snake 1978 and 1984, common lizard 1983 and slow worm 1989, all from Cogges Manor Farm, an area approximately 500 metres to the north of the scheme.

3.2 Results of the 2002 Survey

3.2.1 No evidence for the presence of reptiles was recorded during the 2002 survey for either of the two methods used.

3.3 Results of the 2003 Survey

3.3.1 The survey results for both the Refugia Search and the Visual Search are presented in Table 3 below. The locations of the survey areas are shown on Figure 1.

3.3.2 The visual search of suitable reptile habitat recorded evidence of basking grass snakes on four survey visits. Grass snakes observed were basking on the south facing banks of the River Windrush within the Witney Lakes and Meadows Country Park.

Table 3 Reptile Survey Results 2003

Visit	Refugia Search	Visual Search	Area
1	Juv. Grass Snake	X	Area 5
2	X	X	X
3	X	Adult Grass Snake Observed on the banks of the R. Windrush	Area 2
4	X	Missing	Missing
5	X	Adult Grass Snake Observed on the banks of the R. Windrush	Area 2
6	X	Adult Grass Snake Observed on the banks of the R. Windrush	Area 2
7	X	Adult Grass Snake Observed on the banks of the R. Windrush	Area 2

4 Evaluation

4.1 Although no reptiles were found in 2002, the survey was undertaken at a sub-optimal time of year. As there are local records of reptiles in the area, and the locations chosen for the survey appear to offer ideal conditions for reptiles, their presence was not ruled out, and it was recommended that the survey be repeated at a more appropriate time of year i.e. during suitable conditions in May. This was the reason for the repeat survey which was undertaken in 2003.

4.2 Conditions during the 2003 survey were more suitable for reptiles than they were in 2002, and both adult and juvenile grass snakes were recorded within the footprint of the Scheme (Area 2 and Area 5 respectively). This suggests that there is a breeding population of grass snakes within the vicinity of the Scheme, associated with the Witney Meadows Country Park.

4.3 It is considered that grass snakes are present on both banks of the River Windrush within Area 2. In addition, due to the proximity of Area 4 to Area 5 and the similarity of habitat within each, it is considered that Area 4 also supports grass snake.

4.4 Grass snakes are likely to be restricted to the banks of the River Windrush within the Witney Lakes and Meadows Country Park as the majority of the grassland habitat is cattle-grazed. The sward is therefore short, thus providing little vegetative cover for foraging grass snakes.

4.5 The other areas of potential reptile habitat (Areas 1, 3, 6 and 7) surveyed appear to offer suitable conditions for common reptiles. However, no reptiles were recorded in these areas and it is considered that they are unlikely to be present in any significant numbers.

4.6 Grass snakes are common and widespread within Oxfordshire. Therefore this population of grass snake is considered to be of Parish Importance for nature conservation.

5 Potential Impacts

5.1 Potential Impacts

5.1.1 The location of the CLR and sites surveyed is shown on Figure 1. In the absence of appropriate mitigation the likely potential impacts are set out in the following section.

5.2 Direct Mortality

5.2.1 Grass snake may be killed or injured, both during the construction of the CLR and once it is operational. Killing and/or injury of grass snakes is an offence under the Wildlife and Countryside Act 1981 (as amended), which protects all common British reptiles, from intentional killing and injuring.

5.2.2 A proportion of Areas 2, 4 and 5 are directly under the footprint of the scheme (Figure 1). In the absence of appropriate mitigation, direct mortality of reptiles is likely to occur through general site traffic movement and construction works.

5.2.3 Once the scheme is operational, grass snakes may be vulnerable to traffic mortality.

5.2.4 The mortality of grass snake(s) would result in a Moderate to Major Negative impact on this grass snake population.

5.3 Habitat Loss

5.3.1 Areas of suitable reptile habitat are absent from the majority of the route corridor, which consists mainly of arable farmland and improved grassland. Of the areas of potential reptile habitat identified, 1 and 7 will not be directly affected by the scheme:

- Area 1 will not be lost to the scheme. It is confined to the edge of the 200m wide survey boundary and as such is well removed from the direct impact of construction works.

- Area 7 is not located within the route footprint and will not be lost.

5.3.2 However, the remainder of the survey areas (Areas 2 to 5) will all be directly affected:

- The scheme will result in the loss of approximately 0.15ha (17%) of Area 2 and 0.15ha on the opposite bank to Area 2;

- Approximately 0.05ha (33%) of habitat within Area 3 will be lost;

- All of Area 4 (approximately 0.1ha) will be lost to the Scheme;

- Area 5 is located approximately 50m to the west of the junction where the existing road (roundabout on Witan Way) and the Scheme meet and is

unlikely to be directly affected by the works, although it may experience indirect effects.

5.3.3 The overall loss of suitable reptile habitat to the scheme is approximately 0.36ha; however there is an abundance of potentially suitable reptile habitat within the immediate vicinity. As such, the loss of habitat is considered likely to have a Minor Negative impact on the grass snake population.

5.4 Isolation/Habitat Fragmentation

5.4.1 The scheme is likely to sever reptile habitat, dividing the reptile population into two smaller populations. This would increase the vulnerability of the population to inbreeding and extinction. This severance would also restrict dispersal and may act as a barrier to colonisation of new areas. It is therefore considered that the scheme could have a Moderate Negative impact on this grass snake population.

6 Mitigation and Recommendations

6.1 Background

6.1.1 Proposed mitigation measures to reduce the impacts of the scheme on the reptile population are outlined below. Mitigation work for common reptiles does not require a licence; however, the mitigation methodology should be agreed with Natural England, formerly English Nature. All mitigation works should be undertaken under the supervision of an experienced ecologist.

6.2 Direct Mortality

6.2.1 It is an offence under the Wildlife & Countryside Act 1981 (as amended), to kill and/or injure any common British reptiles.

6.2.2 Due to the relatively small amount of suitable reptile habitat (approximately 0.36ha) to be lost to the scheme, and in the context of the abundance of similar habitat in the vicinity, it is considered unnecessary to undertake a translocation exercise to remove the reptiles from the works areas.

6.2.3 Therefore, in order to exclude reptiles from the works areas, and avoid killing and/or injury, it is proposed that sensitive measures to render Areas 2, 3, 4 and 5 as unsuitable habitat for reptiles are undertaken.

6.2.4 These measures will encourage any reptiles present to move out of the works areas and into adjacent suitable habitat not affected by the scheme.

6.2.5 This can be achieved by undertaking two cuts of the vegetation with a strimmer, under the supervision of an experienced ecologist:

- The first strimmer cut should aim to take the vegetation height to a minimum of 150mm. The strimmed areas must then be left for at least 24 hours, in order to allow any reptiles present to move out of the strimmed areas.
- A second cut should then be undertaken to reduce the vegetation to a maximum of 20mm above ground level.
- The arisings should be removed from the site and if possible, placed in an area not affected by the construction of the scheme.

6.2.6 Once Areas 2, 3, 4 and 5 are cleared of vegetation, each area should be hand searched by an ecologist to ensure that no reptiles are still present. A temporary reptile exclusion fence (for the duration of the works) should be installed around the cleared areas to prevent reptiles re-entering the works areas from adjacent habitats, should the vegetation begin to grow back.

6.2.7 Where future surveys identify additional suitable habitats these areas would be subject to similar mitigation measures.

6.2.8 Reptiles should be excluded from both banks of the River Windrush within Area

2. The bank side vegetation, down to the waters edge and 5m on either side of the works area, should be removed by strimming as per the methodology described above (para 6.2.5). This will encourage any reptiles present to move further along the river bank away from the works area.

6.2.9 Once the bank side vegetation has been removed, a reptile exclusion fence should be installed on both banks and either side of the works area. The fence should extend from the bottom of the bank (water level), to 5m from the top of the banks, and extend to 2m either side of the extent of works area. This will provide a 3m buffer zone of un-vegetated/bare bank side and should discourage grass snakes from swimming into the works area.

6.2.10 After construction works have finished and bank side habitats have been re-instated, grass snakes will have access upstream and downstream of the scheme along the river banks, and by swimming. As such grass snakes should not attempt to cross the scheme itself, once it is operational.

6.3 Habitat Loss

6.3.1 Approximately 8ha of roadside habitat will be created as a result of the scheme. In order to compensate for the 0.36ha of reptile habitat lost, at least 1ha of reptile habitat should be created on south facing road embankments and managed specifically for reptiles. This may include infrequently cut grassland, basking sites and hibernacula/refugia. Provision for reptiles should be considered in the landscape and planting design for the scheme.

6.3.2 Once the construction of the bridge over Area 2 is complete, the bank side vegetation should be recreated. This should be done by ‘seeding’ the banks with seed collected from the adjacent bank side habitat. Of most importance is the creation and establishment of marginal habitat, to provide shelter/cover for grass snakes.

6.4 Isolation/Habitat Fragmentation

6.4.1 The bridge over the River Windrush should be designed to allow continuation of the bank side habitats, i.e. moderate penetration of daylight, along the banks of the River Windrush, allowing it to function as a corridor for grass snakes to move up and down the River Windrush itself and along its banks.

6.4.2 Grass snakes are expert swimmers and the River Windrush should provide a dispersal corridor, allowing grass snakes access to habitats on either side of the River Windrush and upstream and downstream of the scheme. Therefore the grass snake population in the vicinity of the River Windrush is unlikely to be severed or isolated.

7 Residual Impact

7.1 **Direct Mortality**

7.1.1 With the installation of reptile fencing as outlined in the section above, mortality of grass snakes during construction of the scheme can be avoided. Thus the impact is reduced to Minor due to disturbance of the reptiles, and will become Negligible over time.

7.2 **Habitat Loss**

7.2.1 The creation and management of 1ha of reptile habitat will more than compensate for the loss of 0.36ha of reptile habitat, thus reducing the impact to Negligible.

7.3 **Isolation/ Habitat fragmentation**

7.3.1 Depending on the design of the bridge over Area 2, the population of grass snakes in the vicinity of the River Windrush and Witney Lakes and Meadows Country Park is unlikely to be severed or isolated.

7.3.2 Overall, with the creation of reptile habitat on road verges, the grass snakes are likely to benefit in the long term. The road verges may link other suitable habitat to the existing habitat along the River Windrush and enable the grass snakes to disperse and colonise new areas.

8 References & Acknowledgements

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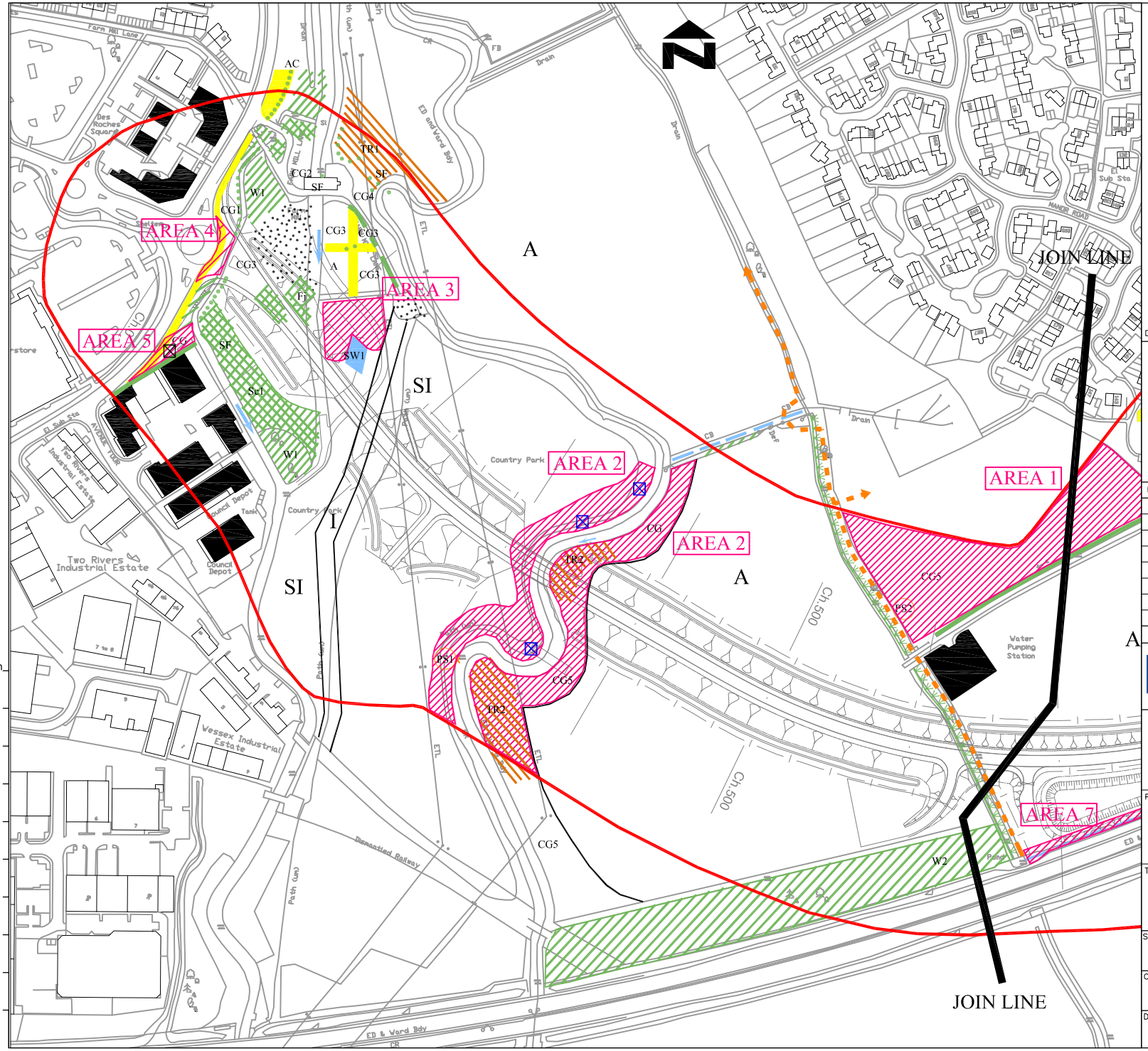

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- Broad-leaved plantation woodland
- Scattered trees - broad leaved
- Dense scrub
- Amenity grassland
- Tall ruderal
- Standing water
- Running water
- Bare ground
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- Fence
- Buildings
- Reptile survey area
- Reptiles observed Basking
- Reptiles recorded under refugia
- Survey Area boundary
- Protected species
- Sf Salix fragilis
- Qr Quercus robur
- Fe Fraxinus excelsior
- Fj Fallopia japonica
- Ac Acer campestre

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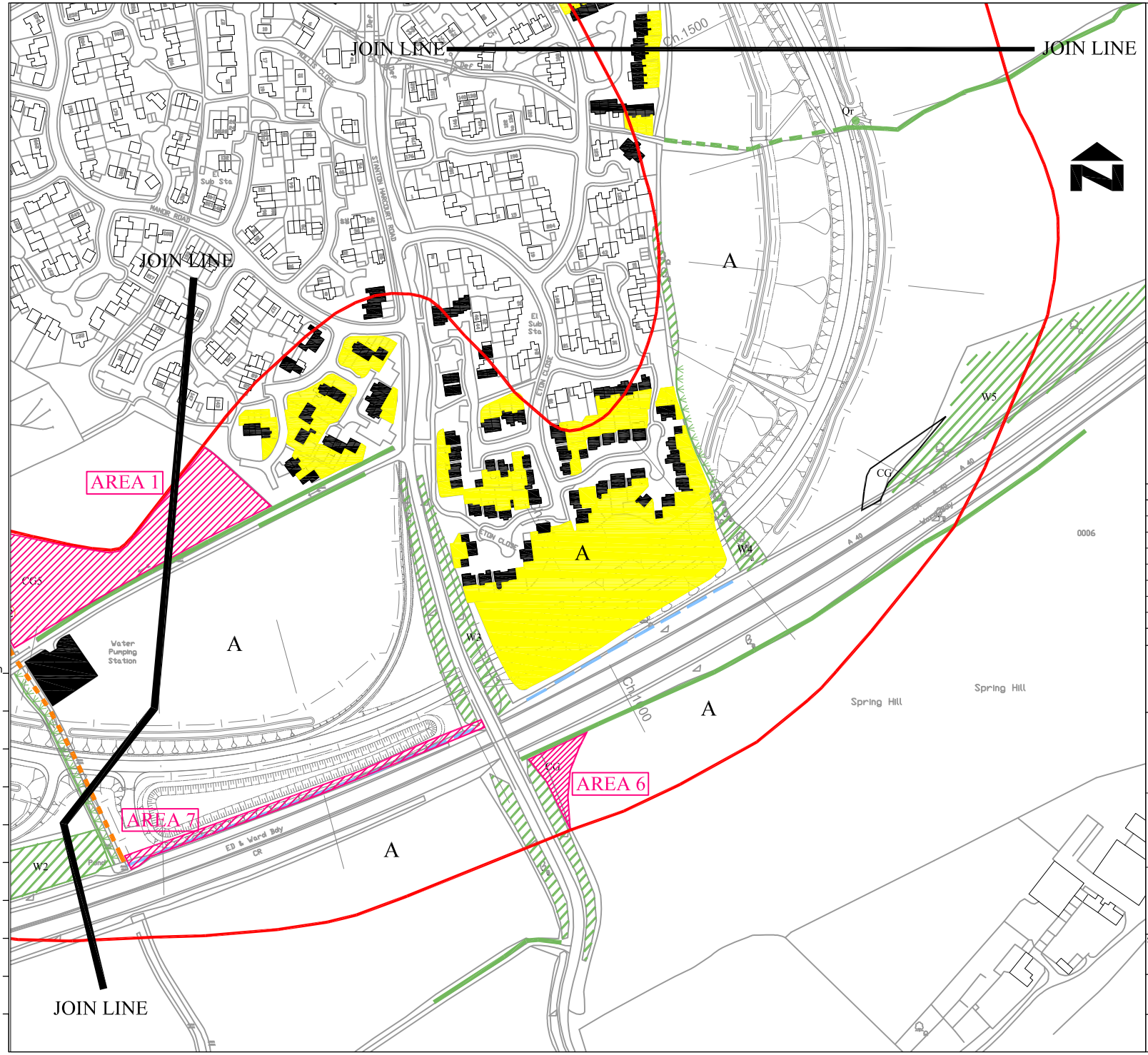

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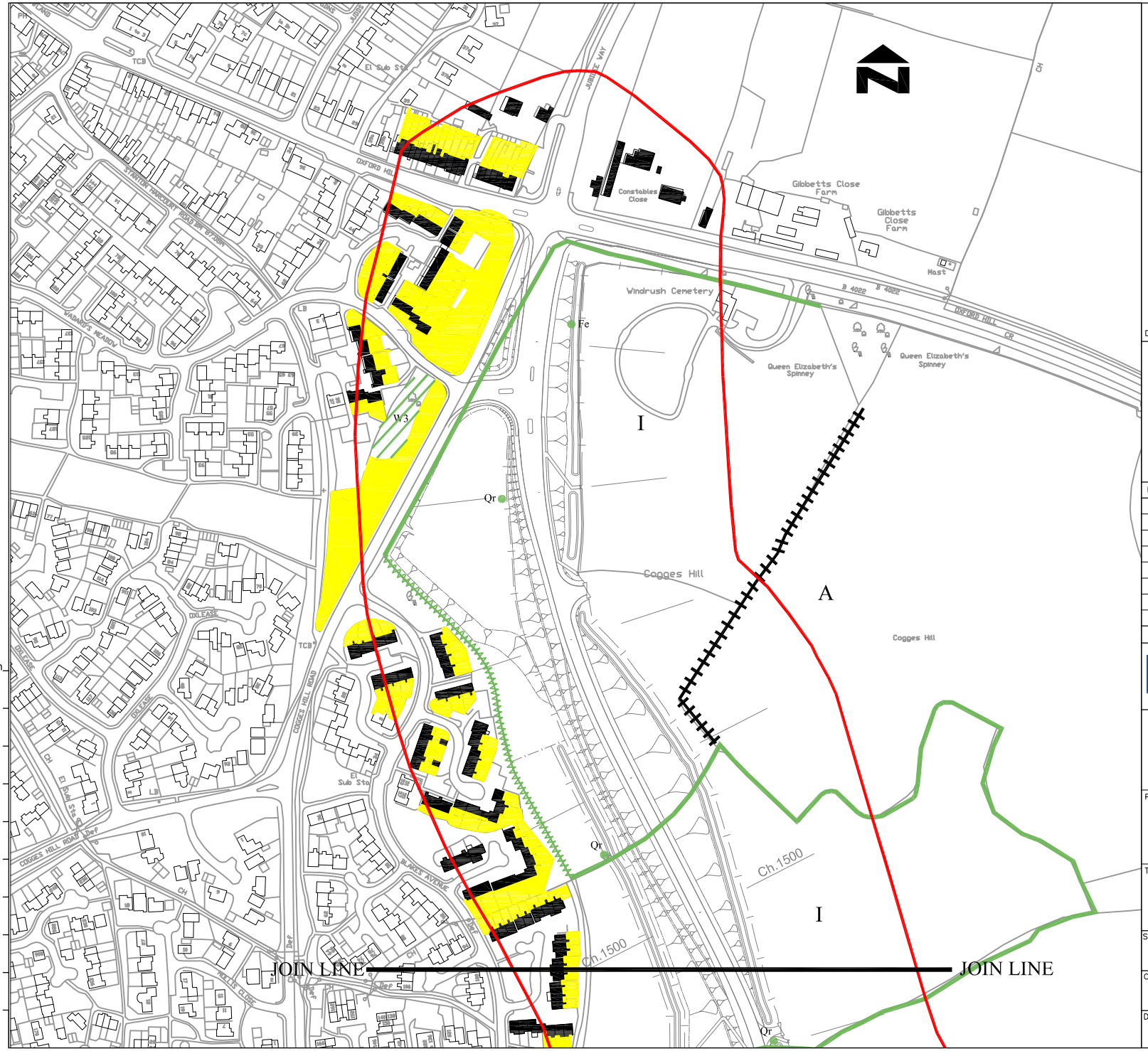

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