

A30 Chiverton to Carland Cross Environmental Statement

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Reptile Survey Report**

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A30 CHIVERTON TO CARLAND CROSS

REPTILE SURVEY REPORT

CONFIDENTIAL

JANUARY 2018

A30 CHIVERTON TO CARLAND CROSS

REPTILE SURVEY REPORT

Highways England

**Final
Confidential**

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1 INTRODUCTION

1.1 OVERVIEW

- 1.1.1 WSP was commissioned by Highways England to undertake ecological surveys in respect of the proposed A30 Chiverton Cross to Carland Cross Improvement Scheme (hereafter referred to as 'the proposed Scheme'). Surveys are required in order to inform an Ecological Impact Assessment (EclA) forming part of an Environmental Statement (ES) supporting a Development Consent Order (DCO) Application for the proposed Scheme.
- 1.1.2 The presence of habitat suitable for reptiles within the proposed Scheme footprint was established during a Phase 1 Habitat Verification Survey¹ undertaken in August 2015. In addition, desk records confirmed the historic presence of reptiles within the 5 km area surrounding the existing A30 between Chiverton Cross and Carland Cross. Accordingly, a reptile presence or likely absence survey was recommended.
- 1.1.3 The objective of the survey was to identify the presence or likely absence of reptile species within suitable habitats to be affected by the proposed Scheme in line with Design Manuals for Roads and Bridges (DMRB) guidelines (HA 116/05)². If reptile presence was confirmed, the results would enable the potential effects of the proposed Scheme to be established and measures required to mitigate or compensate for adverse effects to be described.

1.2 SITE CONTEXT

- 1.2.1 The A30 is a major trunk road running through the centre of Cornwall from West to East. The A30 forms an important route through the county of Cornwall and is under pressure during the summer months due to the high volume of tourism-related traffic. The section of road between Chiverton Cross and Carland Cross is a traffic pinch point, where the dual carriageway narrows to single carriageway in both directions between two roundabouts. The single carriageway sits between grid references SW 74759 46978 at the western end and SW 84665 53957 at the eastern end.
- 1.2.2 The area assessed for its suitability to support reptiles consisted of the 100 m area either side of the 12.7 km length of the proposed Scheme. Within this footprint, ten areas were identified for survey (hereafter referred to as the 'survey area'). It should be noted that at the early stage of the survey design, the preferred Scheme option had not been finalised. As such, the survey area incorporated additional Scheme options and variations that have been subsequently removed.
- 1.2.3 The proposed Scheme area covers a variety of habitats; predominately arable farmland, but also including areas of heathland, woodland, wetland and grassland. The soft estate along this section of road contains hedgerows in some areas but also includes wide grass verges in others. The road at times is raised up offering panoramic views, at others it is cut into the bed rock with steep banks above.

¹ WSP|PB (2015). A30 Carland Cross to Chiverton Cross Phase 1 Habitat Verification Survey. A Report to Highways England

² Design Manual for Roads and Bridges. Volume 10: Environmental Design Management. Section 4: The Good Roads Guide – Nature Conservation. Part 7: HA116/05 Nature Conservation Advice in Relation to Reptiles and Roads. May 2005.

1.3 REPTILE ECOLOGY

- 1.3.1 There are six species of native reptile in the UK, comprising three lizards and three snakes, of which two of each can be found widely within Cornwall. These are adder *Vipera berus*, grass snake *Natrix helvetica*, common lizard *Zootoca vivipara* and slow worm *Anguis fragilis*. The sand lizard *Lacerta agilis* has recently been reintroduced to areas in Cornwall. However, this species is associated with sand dune and sandy heath areas, and is unlikely to be found within the survey area due to the sub-optimal habitats present. The smooth snake *Coronella austriaca* is limited to a small range in the south and south east of England, and is not found in Cornwall. Reptiles will inhabit a range of habitats, but areas with a diverse topography and vegetation structure are favourable³. Features such as south-facing banks, rubble, brash and vegetation piles can be particularly valuable features. UK reptile species usually become dormant and hibernate through much of the winter, using features such as small mammal burrows, dense grass tussocks and other well insulated habitat features. South-facing features that warm up rapidly in the spring are often favoured where present.
- 1.3.2 Reptiles are most active in the summer months (approximately March to October) following hibernation during the winter. During this summer period, mating takes place and most of the UK species internally incubate eggs until 'giving birth' to live young later in the summer season. Grass snakes follow a different strategy, with the female laying eggs in June or July, usually in piles of dense, decaying vegetation that act as incubators as the vegetation releases heat when rotting.
- 1.3.3 All reptiles are cold-blooded or ectothermic, meaning they are unable to produce heat by digesting food and so must use the heat from their surroundings in order to maintain activity. In order to do this, most reptiles will bask in direct sunlight or absorb heat from warm objects.
- 1.3.4 A variety of food sources are taken, ranging from invertebrates for the lizards through to small mammals for adders, but all species are opportunistic and will take a variety of prey.

1.4 LEGISLATION

- 1.4.1 The adder, grass snake, common lizard and slow worm are all protected under Schedule 5 of the Wildlife and Countryside Act (1981, as amended) against deliberate or intentional killing, injuring or trading.
- 1.4.2 The sand lizard and smooth snake receive additional protection as a result of their status as European Protected Species (EPS) and are therefore fully protected under Schedule 2 of the Conservation of Habitats and Species Regulations (2010, as amended). As identified above these two species are highly unlikely to be present in the vicinity of the proposed Scheme.

³ Froglife, 1999. Reptile survey; an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

2 METHODOLOGY

2.1 DESK STUDY

2.1.1 As part of the Phase 1 Habitat Verification Survey, a desk study was undertaken. Designated sites and protected species records were obtained from the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS) for the area within 5 km of the existing A30 between Chiverton Cross and Carland Cross.

2.1.2 Desk study records of relevance within 2 km of the proposed Scheme have been accessed to inform this baseline report.

2.2 SURVEY SCOPING

2.2.1 In accordance with the HA 116/052 for routine surveys of reptiles on road schemes, surveys were restricted to selected habitats, features and locations. These surveys were aimed at investigating the presence or likely absence of reptiles, the assemblage of any species present, the distribution of species within the survey area, the viability of the population, the identification of any important features such as hibernation sites, and whether more detailed surveys would be required.

2.2.2 Potential reptile habitat areas within 100 m from the proposed Scheme were identified using information obtained from the Phase 1 Habitat Verification Survey and aerial photography.

2.2.3 Habitat suitability for reptiles was considered using the following criteria as described in HA 116/052 and areas were classified as being of 'high', 'medium' or 'low' suitability as described in Table 1:

- Aspect and topographic variation;
- Micro-topographic variation;
- Exposed substrates;
- Refuges and hibernacula;
- Structurally diverse vegetation;
- High densities of prey species; and
- Habitat corridors.

Table 1: Reptile Survey Habitat Sampling Selection Criteria

SUITABILITY	CRITERIA
High suitability reptile habitat	Good examples of a large extent of connected mosaics of grassland, scrub, heathland and woodland edge habitats. Areas of 'coarse grassland'.
Moderate suitability reptile habitat	Areas of poorly connected scrub and woodland edge habitats limited in extent. Connected hedgerows and small areas of intersected grassland.
Low suitability reptile habitat	Arable fields. Small unconnected hedgerows. Urban areas dominated by hard-standing, buildings, and regularly managed vegetation.

2.2.4 The survey focused on both high and medium quality reptile habitat within the 100 m search area from the proposed Scheme alignment. Areas of low quality habitat were scoped out and

not included in the survey.

- 2.2.5 This sampling of habitat of both high and medium suitability ensured that information was gathered from habitats within the proposed Scheme footprint with the potential to support ecologically significant reptile populations.
- 2.2.6 During the Scoping, twelve areas were identified to have potentially moderate or high suitability, as shown in Figure 1.
- 2.2.7 Two of the moderate habitat areas identified were not taken forward to survey due to the lack of safe access and isolation of the habitat by the existing road network. These areas are identified on Figure 1 and Table 2 (adjacent to Carland Cross roundabout and a small area of isolated habitat by roads and intensively managed arable land at Chybucca junction).

2.3 FIELD SURVEY

- 2.3.1 The field survey was designed in conjunction with best practice guidelines^{2,4,5&6}. The main method of survey used was artificial refugia in the form of 'tins' or 'tiles'. This method employs the use of heat absorbing material cut into 0.5 to 1.0 m² squares to provide suitable refuge opportunities in areas of suitable habitat. These tiles provide optimal concealed basking opportunities for reptiles underneath or on top of the surface.
- 2.3.2 Highways England (HA 116/05) advises that the most effective approach to survey is to combine direct observation and artificial refugia surveys. Accordingly, direct observations of basking reptiles were recorded during the reptile surveys. Whilst moving between refugia, key features (such as embankments and existing natural refugia) were checked for reptile presence or signs of presence.
- 2.3.3 The survey used 365 tiles in total across 10 locations with approximately 290 roofing felt and 75 tiles of onduline at 20 m intervals within optimal habitat in the survey area. Tile density was calculated using the area of the suitable habitat and allowing for a minimum of 10 tiles per hectare, with the distribution dependent upon the spatial configuration of the habitat². The tiles were then placed primarily along hedgerows where impacts from the proposed Scheme were likely to be seen. Figure 2 illustrates the location of the tiles.
- 2.3.4 The survey was set up on the 9th-11th May 2017 and checked seven times on the following dates:
 - 17th May 2017;
 - 22nd May 2017;
 - 25th and 26th May 2017;
 - 30th May 2017;
 - 7th June 2017;
 - 9th June 2017; and
 - 13th to 16th June 2017, when they were also collected in.

⁴ JNCC, 2003. Herpetofauna Workers Manual, Joint Nature Conservation Committee, Peterborough.

⁵ Froglife, 1999. Reptile survey; an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

⁶ Gent, T. and Gibson, S. (2003) Herpetofauna Workers' Manual. Joint Nature Conservatration Committee, Peterborough.

2.3.5 The surveys were carried out under weather conditions when it was suitable for reptiles to bask (low winds with wind speeds less than 3 on the Beaufort Scale, generally dry, cloudy or sunny weather with temperatures between 9 and 18°C). Surveys were conducted at times to best suit the optimum basking period of the day and attention was paid to previous weather conditions where necessary to identify the optimal time to survey.

2.3.6 Tiles were approached slowly and carefully so that each could be checked for reptiles on top of the tiles on the approach. The tiles were lifted from the far corner back towards the surveyor to limit the risk of a strike should an adder be present, and to maximise the likelihood of observing any reptiles present. The species, age, and sex of any reptiles present was recorded where possible.

2.4 SURVEY LIMITATIONS

2.4.1 HA 116/052 state that a minimum of five surveys must be undertaken during April to late May. Due to timing constraints only four were completed during May, with an additional three being completed in June. The three surveys carried out in June were within the first two weeks of the month when weather conditions were still suitable. In addition, the surveys were carried out in optimal conditions with the visits structured to take account of daily timing variations in order to maximise the chances of finding reptiles.

2.4.2 The weather conditions were largely optimal during the survey period. During the final June survey, it was noted that night time temperatures did not drop particularly low, and daytime temperatures rose quickly. It was therefore necessary to split surveys across three mornings during the final survey to ensure these were carried out under optimal survey conditions.

2.4.3 Within Area 6, approximately 50% of the tiles were destroyed by cattle in the western most field surveyed. Tiles were replaced after the second survey. However, these had also been destroyed by the cattle by the third survey. Due to the absence of any results in Area 6 in comparison to other areas of similar habitat, it is considered likely that reptiles were missed in this area as a result of the lost refugia. The regular disturbance by cattle is likely to limit the number of reptiles that can be supported in this area; hence it is unlikely that any large populations are present.

2.4.4 Reptiles are cryptic species, and their detectability can vary in response to a wide range of factors, including habitat types, season, prey availability and disturbance levels. Some species also utilise different habitats at different times of the year. It is therefore possible that low numbers of reptiles will use suitable habitats within the vicinity of the proposed Scheme where they were not recorded during the surveys. It is highly unlikely, however, that any substantial reptile population will occur in these areas.

3 RESULTS

3.1 DESK STUDY

3.1.1 The desk study identified 19 reptile records within 2 km of the proposed Scheme. These included all four common species. There were seven records of adder, which were located at Allet Bog, Newlyn Downs, Wheal Busy, Wheal Rose, and Chiverton Nature Reserve. All of these records were more than 700 m from the proposed Scheme. There was one grass snake record at Mithian Downs, over 1 km from the proposed Scheme. Five records of slow worm were returned from Ventongimps Nature Reserve, Newlyn Downs and Wheal Rose area. There were six records of common lizard within the search area; these were at Wheal Rose, the SSSI near Stanley Farm, Newlyn Downs and near Pollamounter. All of these records

were more than 500 m from the proposed Scheme.

3.2 SCOPED AREAS

3.2.1 The scoping exercise identified 12 areas of suitable habitat with high or medium quality. These are described in Table 2 below.

Table 2: Summary of habitat types

HABITAT AREA	DESCRIPTION	GRID REFERENCE	TAKEN FORWARD TO SURVEY?
Area 1	An area of rough semi-improved grassland on north facing bank, with a mixed vegetation sward height and adjacent to woodland with watercourses. Occasionally grazed by cattle.	SW 849 543	Yes
Area 2	An area of rough semi-improved grassland with wet areas on with mixed topography, a large hedgerow with wet features was present along the northern boundary. The habitat was located adjacent to the Newlyn Downs heathland. The soil was sandy in areas and some scrub was encroaching from the hedgerow. The field was lightly grazed by cattle.	SW 843 539	Yes
Area 3	An area of heathland isolated from Newlyn Downs, bordered by the A30 to the north and pastoral fields to the south. Mature heathland with no management in place, and an area of scrub surrounding a deep quarry pond in the centre.	SW 841 537	Yes
Area 4	A strip of rough grassland on the highway soft estate, adjacent to a large Cornish hedge with rough semi-improved fields beyond. Wet areas were present within the fields.	SW 824 530	Yes
Area 5	An area of wet rough semi-improved grassland. A large pond was present within the field, with associated wet ditches and nearby ponds in adjacent fields. The pond was bounded by willow on the northern side, and some scrub and rushes on the south. Mature hedgerows were present and the land was occasionally grazed by sheep.	SW 820 527	Yes
Area 6	An area of semi-improved grassland with wet areas along the southern and western boundaries with a network of streams. The fields were bounded by mature Cornish hedges with trees and were grazed by cattle.	SW 812 516	Yes
Area 7	A small semi-improved meadow within woodland around Chyverton Park. Slightly north facing topography but sheltered with adjacent residential property.	SW 802 508	Yes
Area 8	An area of semi-improved wet meadow and adjacent camp site with streams and ponds. The meadow was managed lightly and the camp site was regularly mown, mature Cornish hedges bounded the camp site.	SW 800 501	Yes
Area 9	An area of rough grassland associated with a shoot location. Good Cornish hedges bounded the survey area and the area was largely undisturbed.	SW 787 492	Yes
Area 10	An area of plantation woodland with rough grassland on the central reservation between the A3075 and the A30 at Chyverton Cross roundabout. Also an area of small field networks adjacent to Chyverton Cross roundabout with mature Cornish hedges and rough semi-improved grassland. Some areas of sandy soil and sheltered topography.	SW 747 540	Yes
Area 11	An embankment at Carland Cross roundabout with sandy soils and a mixture of rough grassland and scrub.	SW 846 540	No
Area 12	An area of rough grassland isolated adjacent to Chybucca junction. Old Cornish hedges bounded two sides of the triangle and arable field on the third.	SW 778 487	No

3.3 FIELD SURVEY

3.3.1 The field survey was carried out in appropriate weather conditions and at appropriate times of day, timings and weather conditions are detailed in Appendix 1.

3.3.2 The field survey identified the presence of all four common species of reptile within the survey areas. A summary of the results is presented in Table 3 below.

Table 3: Summary of reptile survey results. SW – slow worm, GS – grass snake, A – adder, CL – common lizard; F – adult female, M – adult male, AU – adult unidentified, SA – subadult, J - juvenile

	CHECK 1	CHECK 2	CHECK 3	CHECK 4	CHECK 5	CHECK 6	CHECK 7
Area 1	-	-	-	-	-	-	-
Area 2	-	-	-	3 F SW	2 F SW	1 F SW	1 F SW 1 J CL 1 F A
Area 3	1 J SW	1 AU CL	1 F SW 1 AU CL	1 F SW 1 J SW 2 AU CL 3 J CL	1 F SW 2 M SW 2 J SW 1 AU CL	2 M SW 1 F SW 2 F CL 2 AU CL	4 J SW
Area 4	-	-	-	-	-	-	-
Area 5	-	-	-	2 J GS	1 AU CL 1 AU GS	1 SA GS 1 J GS	1 SA GS
Area 6	-	-	-	-	-	-	-
Area 7	-	-	-	-	-	-	-
Area 8	-	-	-	-	-	-	-
Area 9	1 AU CL	1 F CL	-	6 AU CL 1 J CL 1 M SW	2 AU CL 2 J CL	2 AU CL	-
Area 10	-	-	-	-	-	-	-

3.3.3 The highest and peak counts from the surveys are summarised in Table 4 below and shown on Figure 3.

Table 4: Summary of peak reptile numbers in each area

	PEAK COUNT OF REPTILES			
	Slow worm	Common lizard	Grass snake	Adder
Area 1	0	0	0	0
Area 2	3	1	0	1
Area 3	5	5	0	0
Area 4	0	0	0	0
Area 5	0	1	2	0
Area 6	0	0	0	0

	PEAK COUNT OF REPTILES			
Area 7	0	0	0	0
Area 8	0	0	0	0
Area 9	1	7	0	0
Area 10	0	0	0	0

- 3.3.4 From the results described above, it has been identified that all four common reptile species are present within suitable habitat along the proposed Scheme.
- 3.3.5 Results indicate that there are high numbers of common lizard and slow worm in Area 3, and that these populations are breeding. Area 9 also has a high number of breeding common lizard, along with a population of slow worm.
- 3.3.6 Area 2 has population of slow worms, common lizard, and adder.
- 3.3.7 Area 5 had a population of grass snake and common lizard. The results show that a range of ages of grass snakes was present within this habitat.
- 3.3.8 Area 6 did not record any reptiles. However, due to the limitation associated with losing refugia to cattle, and based on the habitats present, it should be considered that this area may support reptiles. As set out in the limitations section of this report, it is likely that the disturbance by cattle will limit the size of any reptile population present.
- 3.3.9 Areas 1, 4, 7, 8 and 10 did not record any reptiles. It is possible that very low numbers of reptiles could have been present at the time of survey, but it is considered unlikely that these areas support significant reptile populations.

Appendix A

REPTILE SURVEY TIMING AND WEATHER

AREA 1	DATE	TIME	WEATHER
1	17/05/2017	18.00-19.00	10 C, dry, 7/8, 2 wind
2	22/05/2017	18.55-19.10	16 C, dry, 5/8, 1-2 wind
3	26/05/2017	09.10-09.30	18 C, dry, 2/8, 1-3 wind
4	30/05/2017	17.50-18.15	16.6 C, dry, 8/8, 1 wind
5	07/06/2017	08.30-08.40	15 C, dry, 4/8, 1-2 wind
6	09/06/2017	08.50-09.10	13 C, dry, 4/8, 1-2 wind
7	13/06/2017	10.27-10.53	16 C, dry, 1/8, 0 wind
AREA 2	DATE	TIME	WEATHER
1	17/05/2017	09.30-	11 C, dry, 5/8, 1 wind
2	22/05/2017	19.15-19.35	15 C, dry, 7/8, 1-2 wind
3	26/05/2017	09.30-10.00	18 C, dry, 2/8, 1-3 wind
4	30/05/2017	17.20-17.50	17 C, dry, 6/8, 1 wind
5	07/06/2017	08.45-09.00	15 C, dry, 4/8, 1-2 wind
6	09/06/2017	09.20-09.40	13 C, dry, 4/8, 2 wind
7	13/06/2017	09.55-10.25	15 C, dry, 3/8, 1 wind
AREA 3	DATE	TIME	WEATHER
1	17/05/2017	-	-
2	22/05/2017	09.45-10.25	16.5 C, dry, 7/8, 2 wind
3	26/05/2017	08.15-08.50	17 C, dry, 2/8, 1-3 wind
4	30/05/2017	10.05-10.40	15.8 C, dry, 8/8, 2 wind
5	07/06/2017	09.20-09.50	16 C, dry, 7/8, 1-2 wind
6	09/06/2017	10.05-10.40	15 C, dry, 6/8, 1-2 wind
7	13/06/2017	08.58-09.51	14 C, dry, 7/8, 1 wind
AREA 4	DATE	TIME	WEATHER
1	17/05/2017	-	-
2	22/05/2017	09.25-09.35	15 C, dry, 7/8, 1 wind
3	26/05/2017	07.30-07.35	16 C, dry, 2/8, 1-2 wind
4	30/05/2017	-	-
5	07/06/2017	10.10-10.16	16 C, dry, 7/8, 1-2 wind
6	09/06/2017	10.50-11.00	16 C, dry, 6/8, 1-2 wind
7	-	-	-
AREA 5	DATE	TIME	WEATHER
1	17/05/2017	-	-
2	22/05/2017	08.50-09.10	13 C, dry, 6/8, 1-2 wind
3	26/05/2017	07.45-07.55	16 C, dry, 2/8, 1-2 wind
4	30/05/2017	17.00-17.15	17.4 C, dry, 6/8, 2 wind
5	07/06/2017	10.25-10.45	15 C, dry, 7/8, 1-2 wind
6	09/06/2017	11.05-11.20	17 C, dry, 6/8, 1-2 wind
7	15/06/2017	09.00-09.25	15 C, dry, 6/8, 1 wind

Area 6	Date	Time	Weather
1	19/05/2017	-	-
2	22/05/2017	18.00-18.40	16 C, dry, 3/8, 1-2 wind
3	25/05/2017	08.45-09.20	17 C, dry, 0/8, 2-3 wind
4	30/05/2017	11.05-11.40	17.1 C, dry, 5/8, 2 wind
5	07/06/2017	13.20-13.45	15 C, dry, 8/8, 1 wind
6	09/06/2017	14.15-14.40	17 C, dry, 8/8, 0-1 wind
7	15/06/2017	09.30-10.30	16 C, dry, 7/8, 1 wind
Area 7	DATE	TIME	WEATHER
1	19/05/2017	-	-
2	22/05/2017	17.40-17.50	16 C, dry, 3/8, 1-2 wind
3	25/05/2017	09.30-09.40	18 C, dry, 0/8, 1-2 wind
4	30/05/2017	16.33-16.43	17.9 C, dry, 5/8, 1 wind
5	07/06/2017	10.50-11.00	15 C, dry, 7/8, 1-2 wind
6	09/06/2017	11.35-11.45	16 C, dry, 2/8, 1-2 wind
7	15/06/2017	10.10-10.25	16 C, dry, 6/8, 2 wind
Area 8	DATE	TIME	WEATHER
1	17/05/2017	-	-
2	22/05/2017	17.25-17.35	16 C, dry, 4/8, 1-2 wind
3	25/05/2017	08.20-08.30	15 C, dry, 0/8, 1-2 wind
4	30/05/2017	16.15-16.27	18 C, dry, 6/8, 1 wind
5	07/06/2017	11.10-11.20	15 C, dry, 6/8, 1 wind
6	09/06/2017	11.50-12.00	17 C, dry, 3/8, 1-2 wind
7	15/06/2017	10.30-10.45	17 C, dry, 5/8, 2 wind
Area 9	DATE	TIME	WEATHER
1	17/05/2017	-	-
2	22/05/2017	17.00-17.15	16 C, dry, 4/8, 1-2 wind
3	25/05/2017	07.55-08.10	15 C, dry, 0/8, 1-3 wind
4	30/05/2017	15.25-15.40	17 C, dry, 7/8, 3 wind
5	07/06/2017	11.30-11.45	15 C, dry, 7/8, 1-2 wind
6	09/06/2017	12.20-12.40	17 C, dry, 6/8, 1-2 wind
7	14/06/2017	08.50-09.17	16 C, dry, 1/8, 2 wind
Area 10	DATE	TIME	WEATHER
1	17/05/2017	-	-
2	22/05/2017	16.15-16.50	16 C, dry, 7/8, 1-2 wind
3	25/05/2017	10.00-10.30	18 C, dry, 0/8, 2-3 wind
4	30/05/2017	15.00-15.40	16 C, dry, 8/8, 2 wind
5	07/06/2017	12.00-12.30	15 C, dry, 8/8, 1 wind
6	09/06/2017	12.50-13.15	17 C, dry, 7/8, 1 wind
7	14/06/2017	09.25-09.40	17 C, dry, 2/8, 1 wind

Appendix B

DETAILED SURVEY RESULTS

SPECIES		AGE CLASS	
A	Adder	M	Adult Male
GS	Grass Snake	F	Adult Female
CL	Common Lizard	AU	Adult Unidentified
SW	Slow worm	J	Juvenile
		SA	Sub-adult

AREA 1							
Tile	17/05/2017	22/05/2017	26/05/2017	30/05/2017	07/06/2017	09/06/2017	13/06/2017
	18.00-19.00	18.55-19.10	09.10-09.30	17.50-18.15	08.30-08.40	08.50-09.10	10.27-10.53
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-

AREA 2							
Tile	17/05/2017	22/05/2017	26/05/2017	30/05/2017	07/06/2017	09/06/2017	13/06/2017
	09.30-10.30	19.15-19.35	09.30-10.00	17.20-17.50	08.45-09.00	09.20-09.40	09.55-10.25
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	1 F SW	-	-	-
6	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-
8	-	-	-	1 F SW	1 F SW	1 F SW (FAT)	1 F SW
9	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-
11	-	-	-	-	-	-	1 J CL
12	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-
14	-	-	-	-	-	-	1 F A

AREA 2						
15	-	-	-	-	-	-
16	-	-	-	-	-	-
17	-	-	-	-	-	-
18	-	-	-	-	-	-
19	-	-	-	-	-	-
20	-	-	-	-	-	-
21	-	-	-	-	-	-
22	-	-	-	-	-	-
23	-	-	-	-	-	-
24	-	-	-	-	-	-
25	-	-	-	-	-	-
26	-	-	-	-	-	-
27	-	-	-	-	-	-
28	-	-	-	-	-	-
29	-	-	-	-	-	-
30	-	-	-	-	-	-
31	-	-	-	-	-	-
32	-	-	-	-	-	-
33	-	-	-	-	-	-
34	-	-	-	-	-	-
35	-	-	-	-	-	-
36	-	-	-	-	-	-
37	-	-	1 F SW	1 F SW	-	-
38	-	-	-	-	-	-
39	-	-	-	-	-	-
40	-	-	-	-	-	-
41	-	-	-	-	-	-
42	-	-	-	-	-	-
43	-	-	-	-	-	-
44	-	-	-	-	-	-
45	-	-	-	-	-	-

AREA 3							
Tile	17/05/2017	22/05/2017	26/05/2017	30/05/2017	07/06/2017	09/06/2017	13/06/2017
	10.35- 11.20	09.45-10.25	08.15-08.50	10.05-10.40	09.20-09.50	10.05-10.40	08.58-09.51
1	-	-	-	-	-	-	-
2	-	-	-	-	1 F SW	-	-
3	-	-	-	1 F SW	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-
8	-	1 AU CL	-	-	1 CL	-	-
9	-	-	-	-	2 J SW	-	2 J SW
10	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-
12	-	-	-	-	-	-	1 J SW
13	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-

AREA 3							
15	-	-	1 F SW	1 J SW	-	1 M SW	1 J SW
16	1 J SW	-	-	-	-	-	-
17	-	-	-	-	1 M SW	1 F SW	-
18	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-
20	-	-	-	1 AU CL	-	-	-
21	-	-	-	-	-	-	-
22	-	-	1 AU CL	1 J CL	-	-	-
23	-	-	-	1 J CL	-	-	-
24	-	-	-	-	-	1 F CL	-
25	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-
29	-	-	-	-	-	1 F CL (ground), 1 AU CL	-
30	-	-	-	1 J CL	1 M SW	1 M SW	-
31	-	-	-	1 AU CL	-	-	-
32	-	-	-	-	-	-	-
33	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-

AREA 4							
Tile	17/05/2017	22/05/2017	26/05/2017	30/05/2017	07/06/2017	09/06/2017	14/06/2017
	11.25-11.35	09.25-09.35	07.30-07.35	09.30-10.45	10.10-10.16	10.50-11.00	08.30-08.45
1	-	-	-	-	-	-	
2	-	-	-	-	-	-	
3	-	-	-	-	-	-	
4	-	-	-	-	-	-	
5	-	-	-	-	-	-	
6	-	-	-	-	-	-	
7	-	-	-	-	-	-	
8	-	-	-	-	-	-	
9	-	-	-	-	-	-	
10	-	-	-	-	-	-	

AREA 5							
Tile	17/05/2017	22/05/2017	26/05/2017	30/05/2017	07/06/2017	09/06/2017	15/06/2017
	11.40-12.00	08.50-09.10	07.45-07.55	17.00-17.15	10.25-10.45	11.05-11.20	09.00-09.25
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-

AREA 5						
9	-	-	-	-	-	-
10	-	-	-	-	-	-
11	-	-	1 J GS - next to tile	1 CL	1 J GS	-
12	-	-	-	-	-	-
13	-	-	-	-	-	-
14	-	-	-	-	-	-
15	-	-	1 J GS	-	-	-
16	-	-	-	1 AU GS	1 SA GS	1 SA GS
17	-	-	-	-	-	-
18	-	-	-	-	-	-
19	-	-	-	-	-	-
20	-	-	-	-	-	-

AREA 6							
Tile	19/05/2017	22/05/2017	25/05/2017	30/05/2017	07/06/2017	09/06/2017	15/06/2017
	15.00-15.45	18.00-18.40	08.45-09.20	11.05-11.40	13.20-13.45	14.15-14.40	09.30-10.30
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-
14	-	-	-	-	-	-	x
15	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-
26	x	x	x	x	x	x	x
27	x	x	x	x	x	x	x
28	-	-	-	-	-	x	x
29	-	-	x	x	x	x	x
30	-	-	-	-	-	-	-
31	x	x	x	x	x	x	x
32	-	x	x	x	x	x	x

AREA 6							
33	x	x	x	x	x	x	x
34	-	-	-	-	-	x	x
35	-	-	-	-	-	-	-
36	-	-	-	-	-	-	-
37	x	x	x	x	x	x	x
38	x	x	x	x	x	x	x
39	x	x	x	x	x	x	x
40	-	-	-	-	-	-	-
41	-	-	-	-	-	-	-
42	x	x	x	x	x	x	x
43	-	-	x	x	x	x	x
44	x	x	x	x	x	x	x
45	x	x	x	x	x	x	x
46	x	x	x	x	x	x	x
47	x	x	x	x	x	x	x
48	-	x	x	x	x	x	x
49	-	-	x	x	x	x	x
50	-	-	x	x	x	x	x
51	-	-	x	x	x	x	x
52	x	-	x	x	x	x	x
53	x	x	x	x	x	x	x
54	-	-	x	x	x	x	x
55	x	x	x	x	x	x	x
56	-	x	x	x	x	x	x
57	x	-	x	x	x	x	x
58	x	-	x	x	x	x	x
59	x	x	x	x	x	x	x
60	x	-	x	x	x	x	x
61	x	x	x	x	x	x	x
62	x	x	x	x	x	x	x
63	x	x	x	x	x	x	x
64	-	x	x	x	x	x	x
65	x	x	x	x	x	x	x
66	x	x	x	x	x	x	x
67	x	x	x	x	x	x	x
68	x	x	x	x	x	x	x
69	x	x	x	x	x	x	x
70	-	-	x	x	x	x	x
71	x	x	x	x	x	x	x
72	x	x	x	x	x	x	x
73	x	x	x	x	x	x	x
74	x	x	x	x	x	x	x
75	x	x	x	x	x	x	x
76	-	x	x	x	x	x	x
77	-	-	x	x	x	x	x
78	-	-	x	x	x	x	x
79	-	-	x	x	x	x	x
80	-	-	-	-	-	-	-

AREA 6							
81	-	-	x	x	x	x	x
82	-	-	x	x	x	x	x
83	-	-	x	x	x	x	x
84	-	-	x	x	x	x	x
85	-	-	-	-	x	x	x
86	-	-	-	-	-	-	-
87	-	-	-	-	x	x	x
88	-	-	-	-	x	x	x
89	-	-	-	-	x	x	x
90	-	-	-	-	-	-	-
91	-	-	-	-	x	x	x
92	-	-	-	-	-	-	-
93	-	x	-	-	-	-	-
94	-	-	-	-	-	-	-
95	-	-	-	-	-	-	-
96	-	-	-	-	-	-	-
97	-	-	-	-	-	-	-
98	-	-	-	-	-	-	-
99	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-

AREA 7							
Tile	19/05/2017	22/05/2017	25/05/2017	30/05/2017	07/06/2017	09/06/2017	15/06/2017
	15.50-16.00	17.40-17.50	09.30-09.40	16.33-16.43	10.50-11.00	11.35-11.45	10.10-10.25
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-

AREA 8							
Tile	17/05/2017	22/05/2017	25/05/2017	30/05/2017	07/06/2017	09/06/2017	15/06/2017
	16.15-16.30	17.25-17.35	08.20-08.30	16.15-16.27	11.10-11.20	11.50-12.00	10.30-10.45
1	-	-	-	-	-	-	-

AREA 8						
2	-	-	-	-	-	-
3	-	-	-	-	-	-
4	-	-	-	-	-	-
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-
9	-	-	-	-	-	-
10	-	-	-	-	-	-
11	-	-	-	-	-	-
12	-	-	-	-	-	-
13	-	-	-	-	-	-
14	-	-	-	-	-	-
15	-	-	-	-	-	-
16	-	-	-	-	-	-
17	-	-	-	-	-	-
18	-	-	-	-	-	-
19	-	-	-	-	-	-
20	-	-	-	-	-	-
21	-	-	-	-	-	-
22	-	-	-	-	-	-
23	-	-	-	-	-	-
24	-	-	-	-	-	-
25	-	-	-	-	-	-
26	-	-	-	-	-	-
27	-	-	-	-	-	-
28	-	-	-	-	-	-
29	-	-	-	-	-	-
30	-	-	-	-	-	-
31	-	-	-	-	-	-
32	-	-	-	-	-	-
33	-	-	-	-	-	-
34	-	-	-	-	-	-
35	-	-	-	-	-	-

AREA 9							
Tile	17/05/2017	22/05/2017	25/05/2017	30/05/2017	07/06/2017	09/06/2017	14/06/2017
	16.45-17.05	17.00-17.15	07.55-08.10	15.25-15.40	11.30-11.45	12.20-12.40	08.50-09.17
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-
10	-	-	-	-	-	1 AU CL	-
11	-	-	-	1 J CL	2 AU CL	-	-

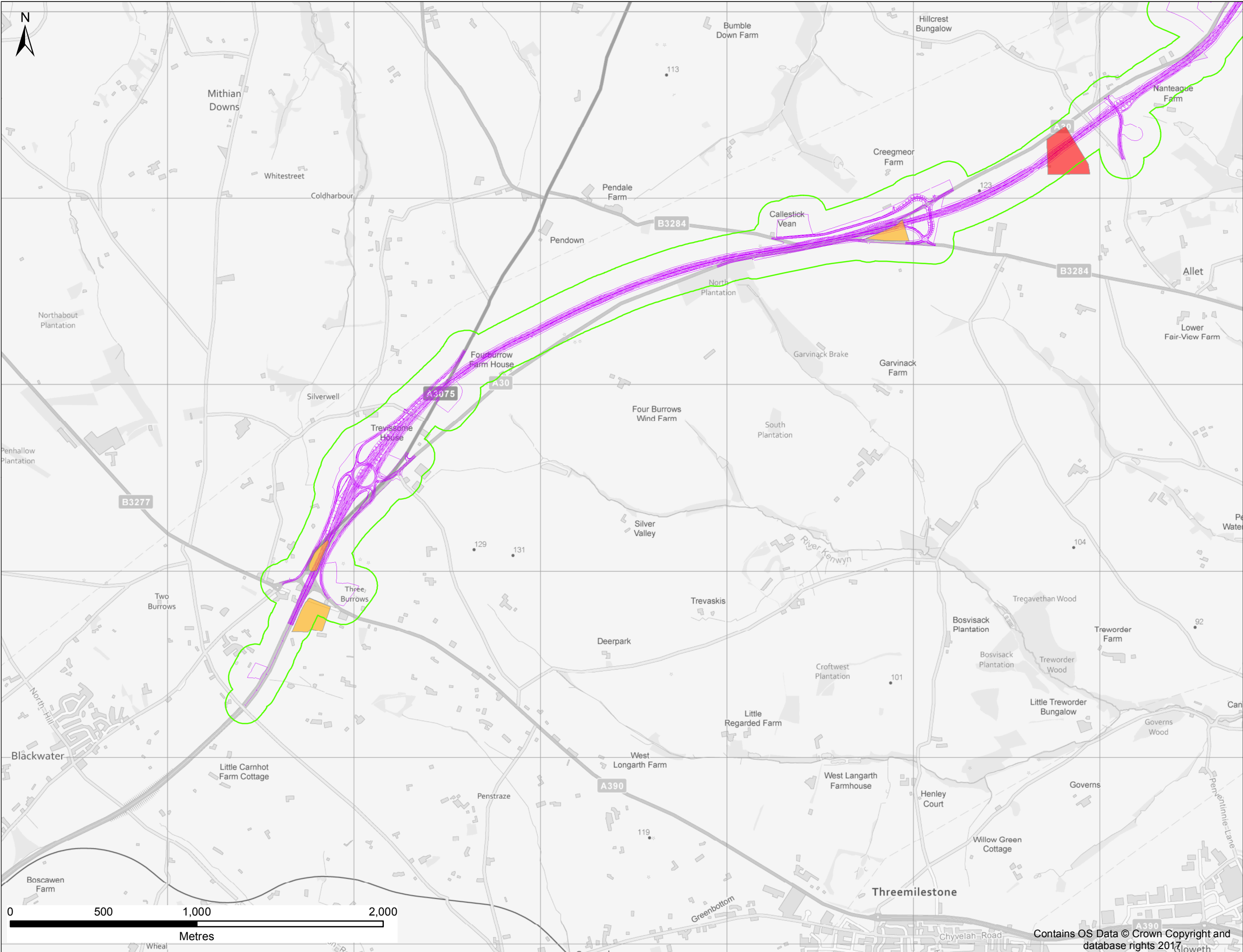
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12	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-
17	-	-	-	1 AU CL	-	-	-
18	-	-	-	3 AU CL	-	-	-
19	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-
23	-	-	-	-	-	1 AU CL	-
24	-	-	-	1 AU CL	-	-	-
25	-	-	-	-	-	-	-
26	-	-	-	1 AU CL	-	-	-
27	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-
29	-	-	-	-	2 J CL	-	-
30	-	-	-	-	-	-	-
31	-	-	-	1 M SW	-	-	-
32	-	-	-	-	-	-	-
33	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-
36	1 AU CL	1 F CL	-	-	-	-	-
37	-	-	-	-	-	-	-
38	-	-	-	-	-	-	-
39	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-
41	-	-	-	-	-	-	-
42	-	-	-	-	-	-	-
43	-	-	-	-	-	-	-
44	-	-	-	-	-	-	-
45	-	-	-	-	-	-	-

AREA 10							
Tile	17/05/2017	22/05/2017	25/05/2017	30/05/2017	07/06/2017	09/06/2017	14/06/2017
	17.15-17.35	16.15-16.50	10.00-10.30	15.00-15.40	12.00-12.30	12.50-13.15	09.25-09.40
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-

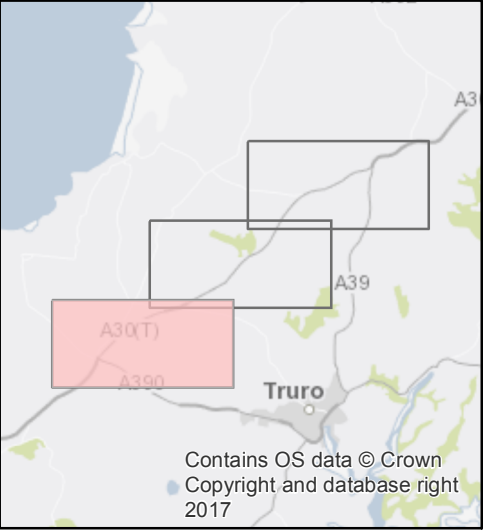
AREA 10							
11	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-
21	-	-	-	-	-	X	X
22	-	-	-	-	-	X	X
23	-	-	-	-	-	X	X
24	-	-	-	-	X	X	X
25	x	x	-	-	X	X	X
26	x	x	-	-	X	X	X
27	x	x	-	-	X	X	X
28	x	x	-	-	X	X	X
29	x	x	-	-	X	X	X
30	x	x	-	-	X	X	X
31	x	x	-	-	X	X	X
32	-	-	-	-	-	-	-
33	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-

Appendix C

FIGURES



- 100m Buffer
- Option 7A
- Reptile Scoping Areas**
- Medium Potential
- High Potential



Rev	Date	Description	By	Chk	App	Notes



Kings Orchard,
1 Queen Street, Bristol
BS2 0HQ

Tel: 44-(0)117-930-6200

Client:



Project:

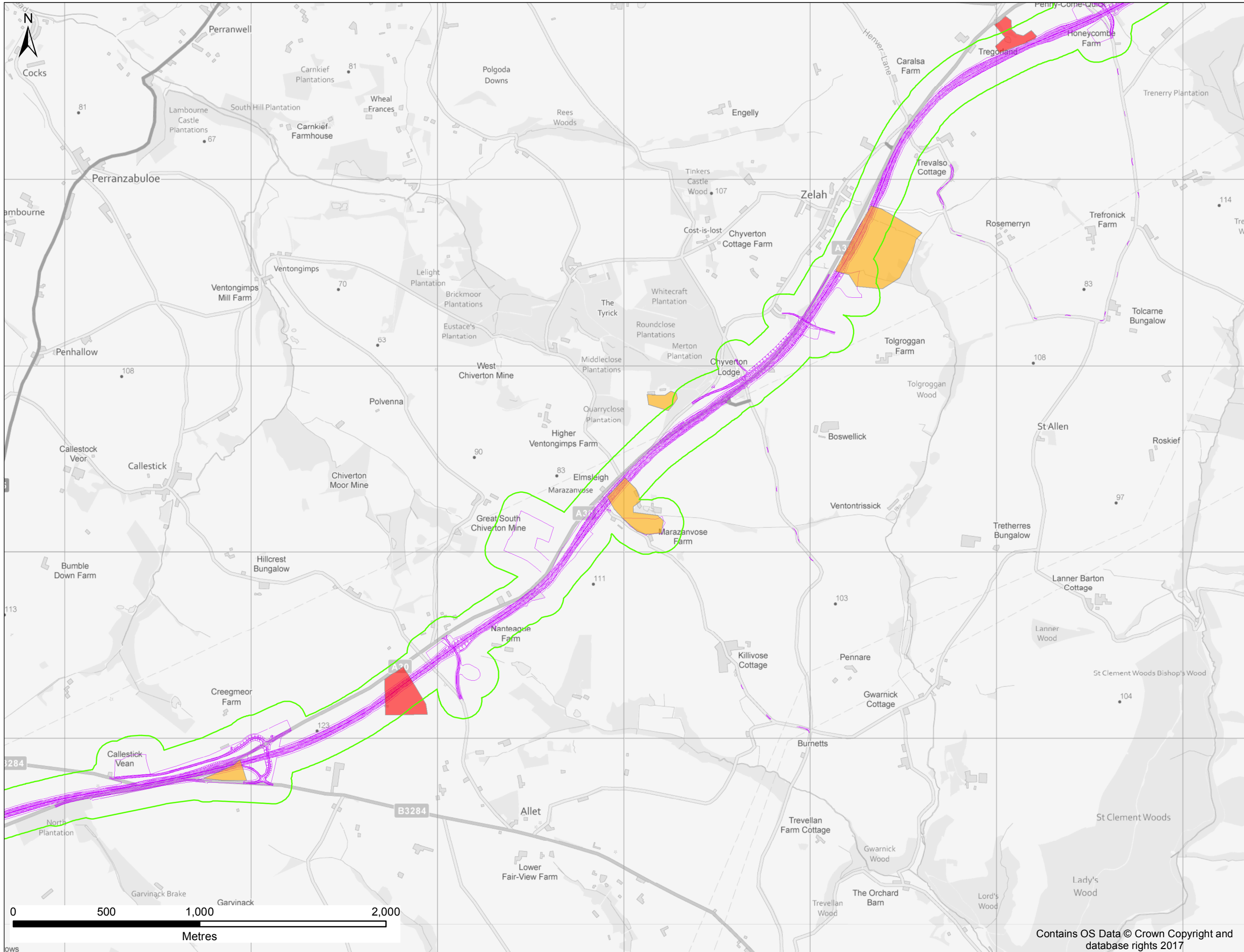
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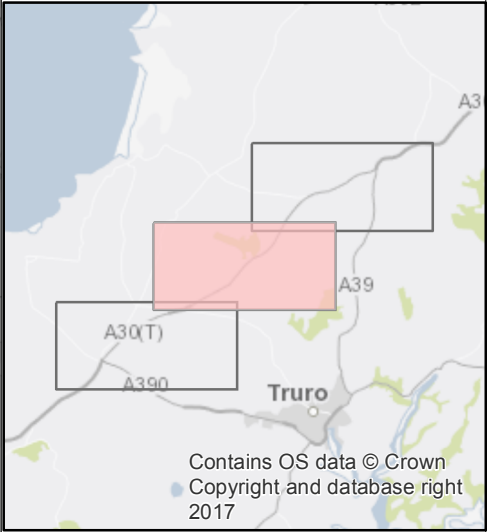
REPTILE SCOPING AREAS
PAGE 1 OF 3

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Designed: LM	Approved: UD
Date: 25/08/2017	Scale: 1:20,000
Project Number: 70004582	Drawing Number: FIGURE 1

File Name: \\uk.wspgroup.com\central data\Projects\70004xxx\70004582 - A30 Chiverton to Carland Cross PCF Stage 2\IC Documents\Ecology\Surveys\mapping\Maping for Scott Turnbull\Figure 1 - Reptile Scoping Areas.mxd
Plot Date: 25/08/2017 Login: DeSouzaJ



- 100m Buffer
- Option 7A
- Reptile Scoping Areas**
- Medium Potential
- High Potential



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Rev	Date	Description	By	Chk	App	Notes

Kings Orchard,
1 Queen Street, Bristol
BS2 0HQ

Tel: 44-(0)117-930-6200

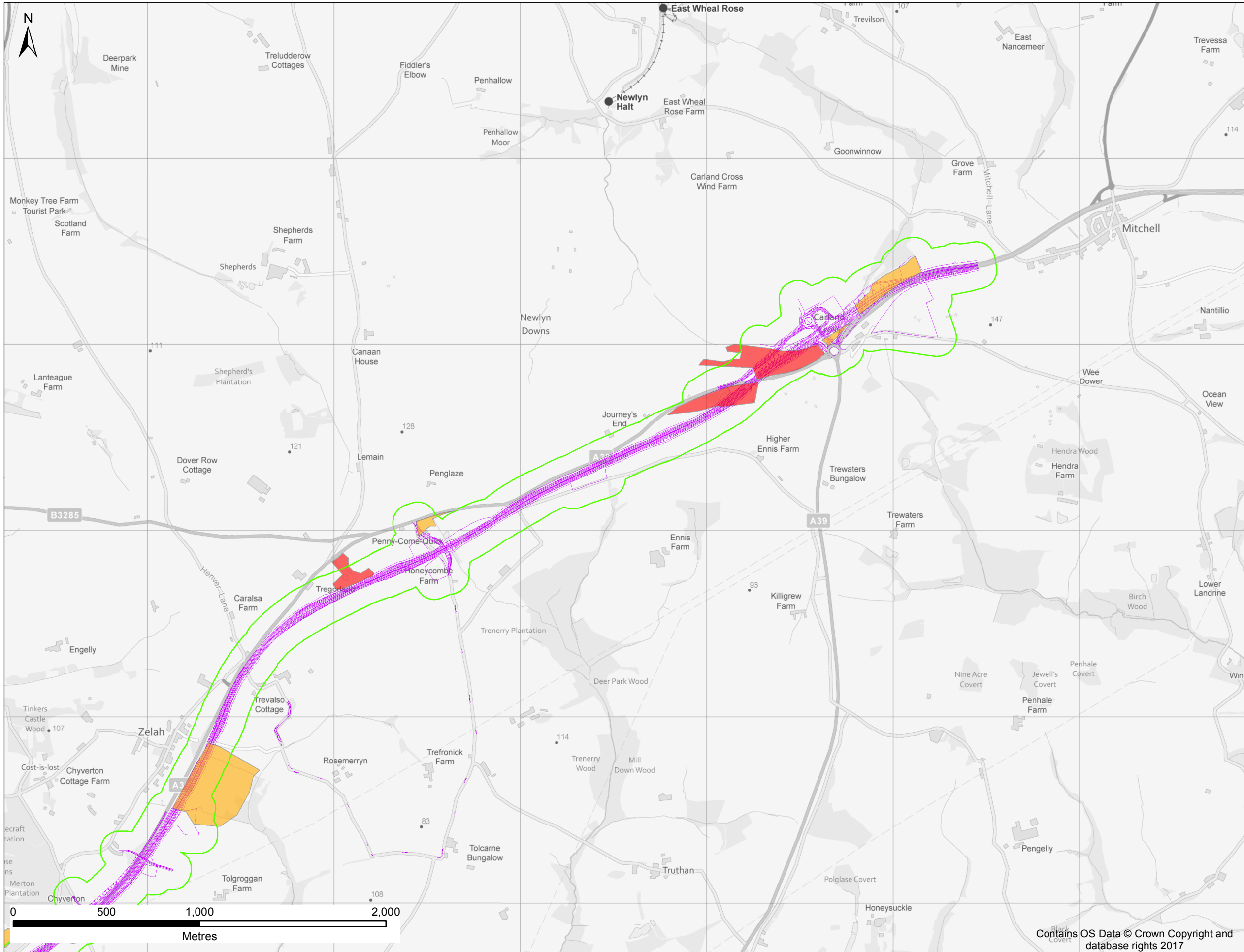
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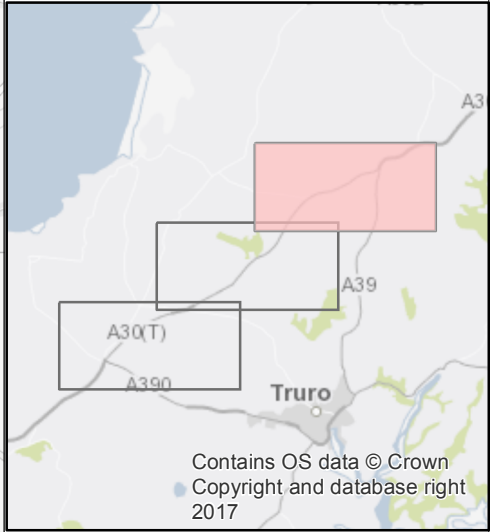
A30 CHIVERTON TO
CARLAND CROSS

Title: REPTILE SCOPING AREAS
PAGE 2 OF 3

Drawn: ST	Checked: JSdS
Designed: LM	Approved: UD
Date: 25/08/2017	Scale: 1:20,000
Project Number: 70004582	Drawing Number: FIGURE 1
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- 100m Buffer
- Option 7A
- Reptile Scoping Areas**
- Medium Potential
- High Potential



Rev	Date	Description	By	Chk	App	Notes



Kings Orchard,
1 Queen Street, Bristol
BS2 0HQ

Tel: 44-(0)117-930-6200

Client:



Project:

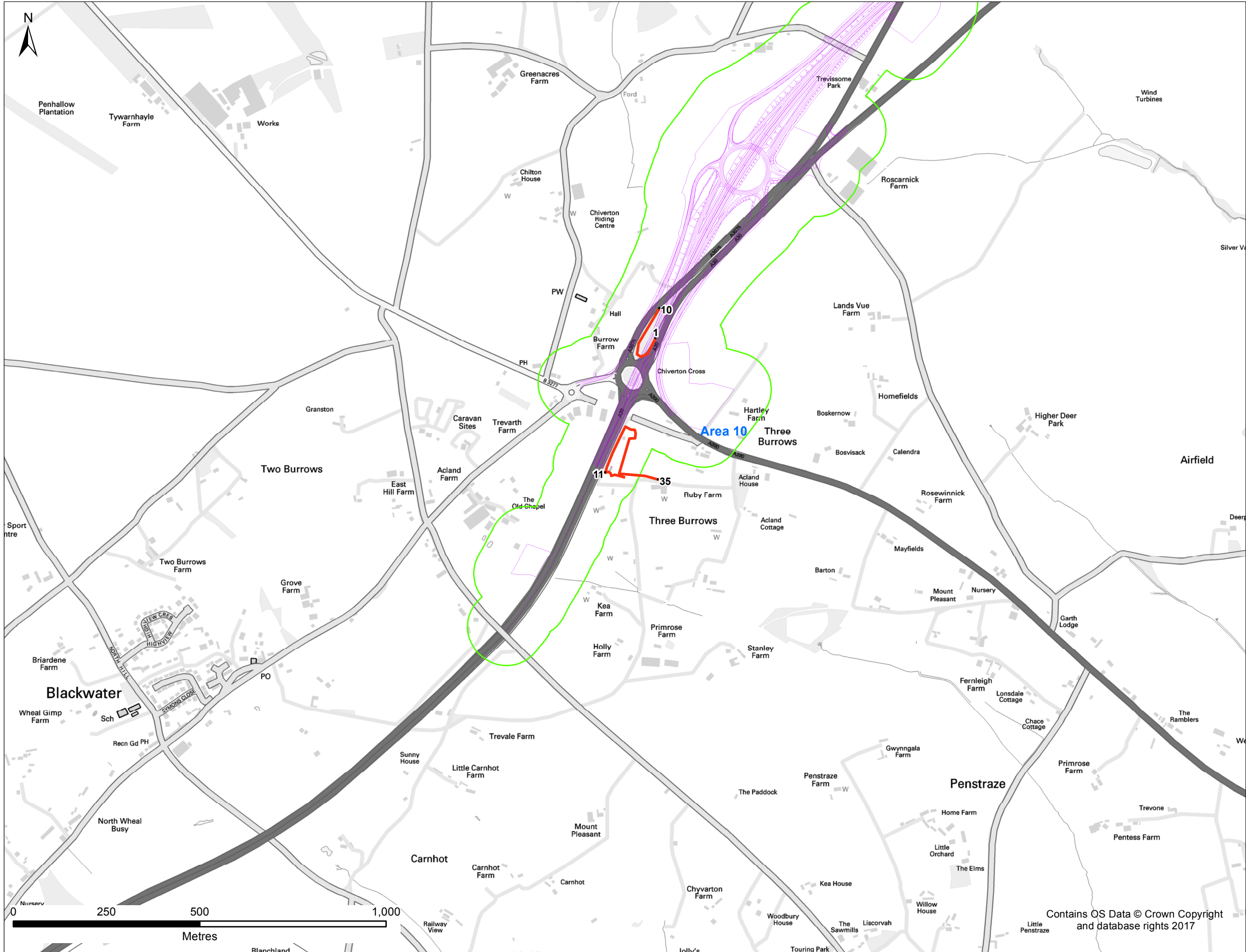
**A30 CHIVERTON TO
CARLAND CROSS**

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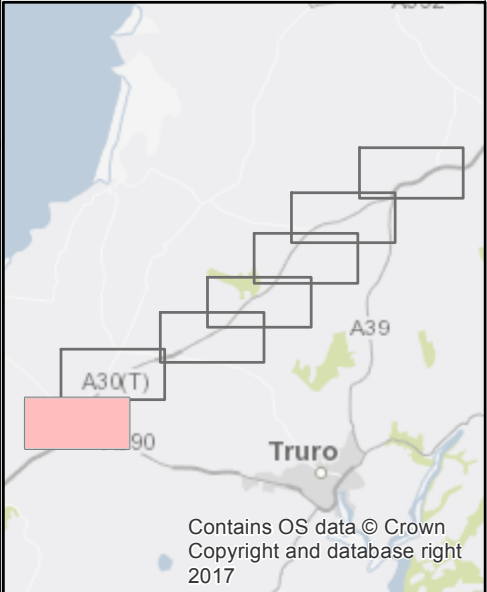
**REPTILE SCOPING AREAS
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- Survey Areas
- 100m Buffer
- Option 7A



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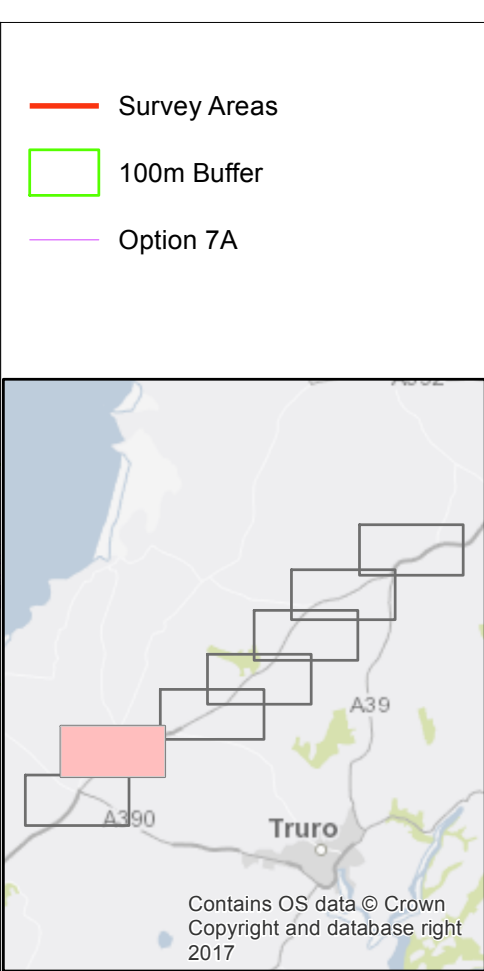
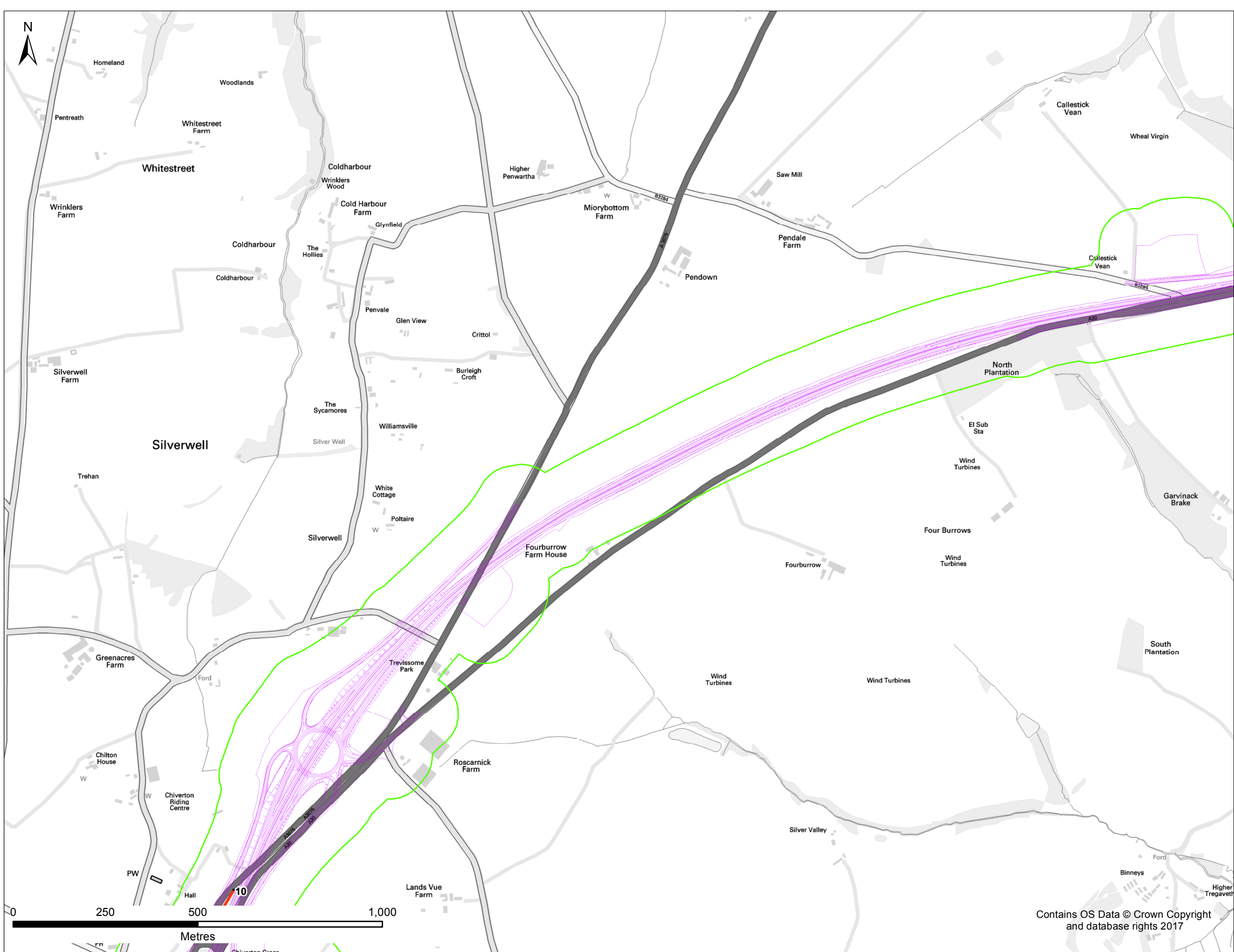
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**A30 CHIVERTON TO
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**REPTILE SURVEY AREAS
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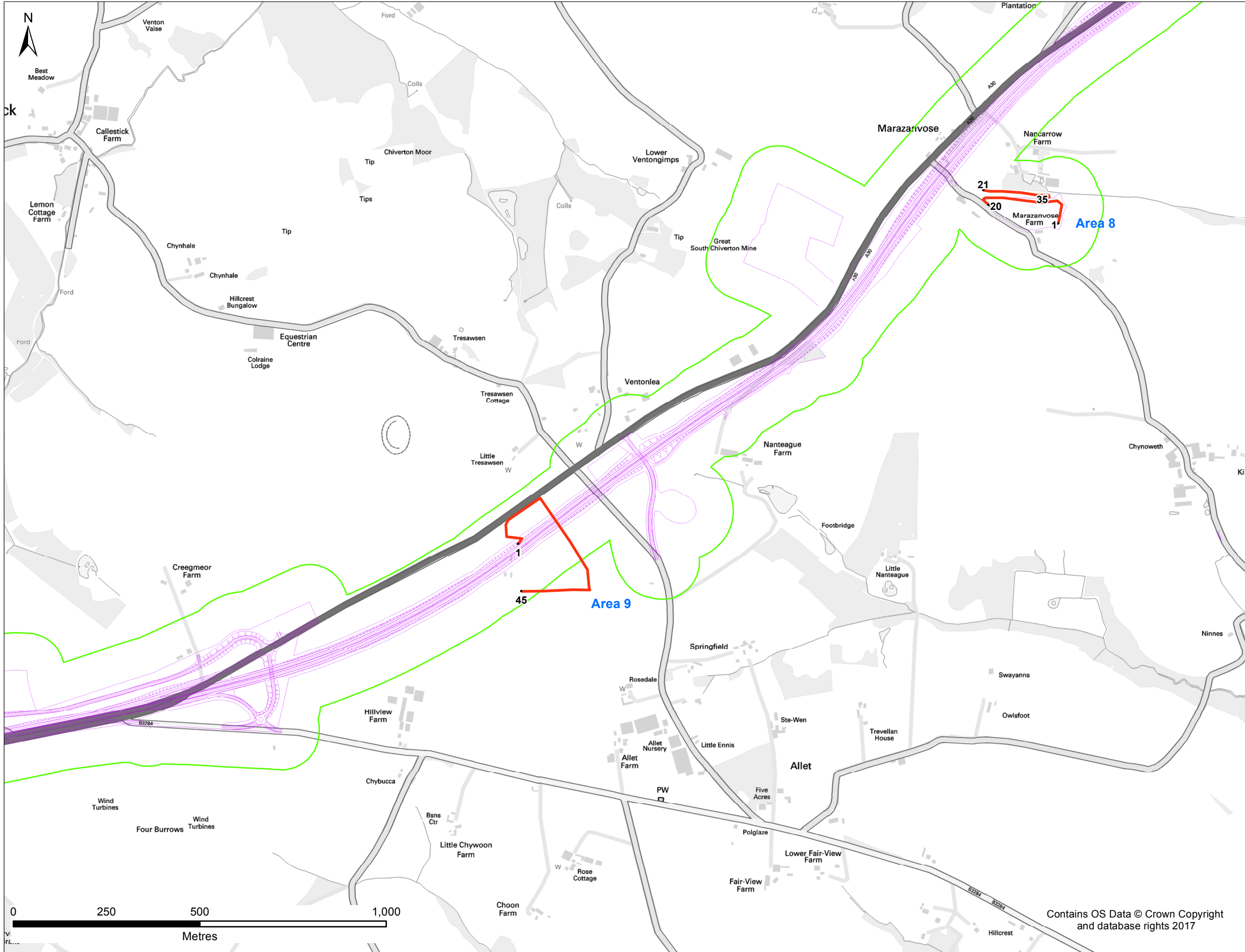
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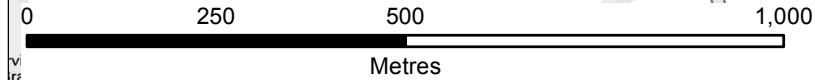
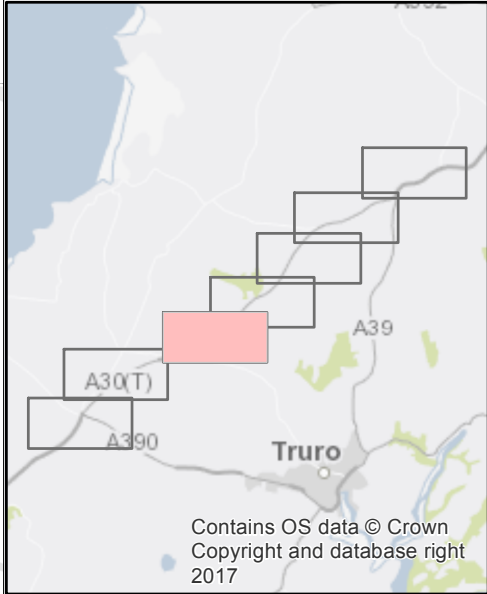
REPTILE SURVEY AREAS
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- Survey Areas
- 100m Buffer
- Option 7A



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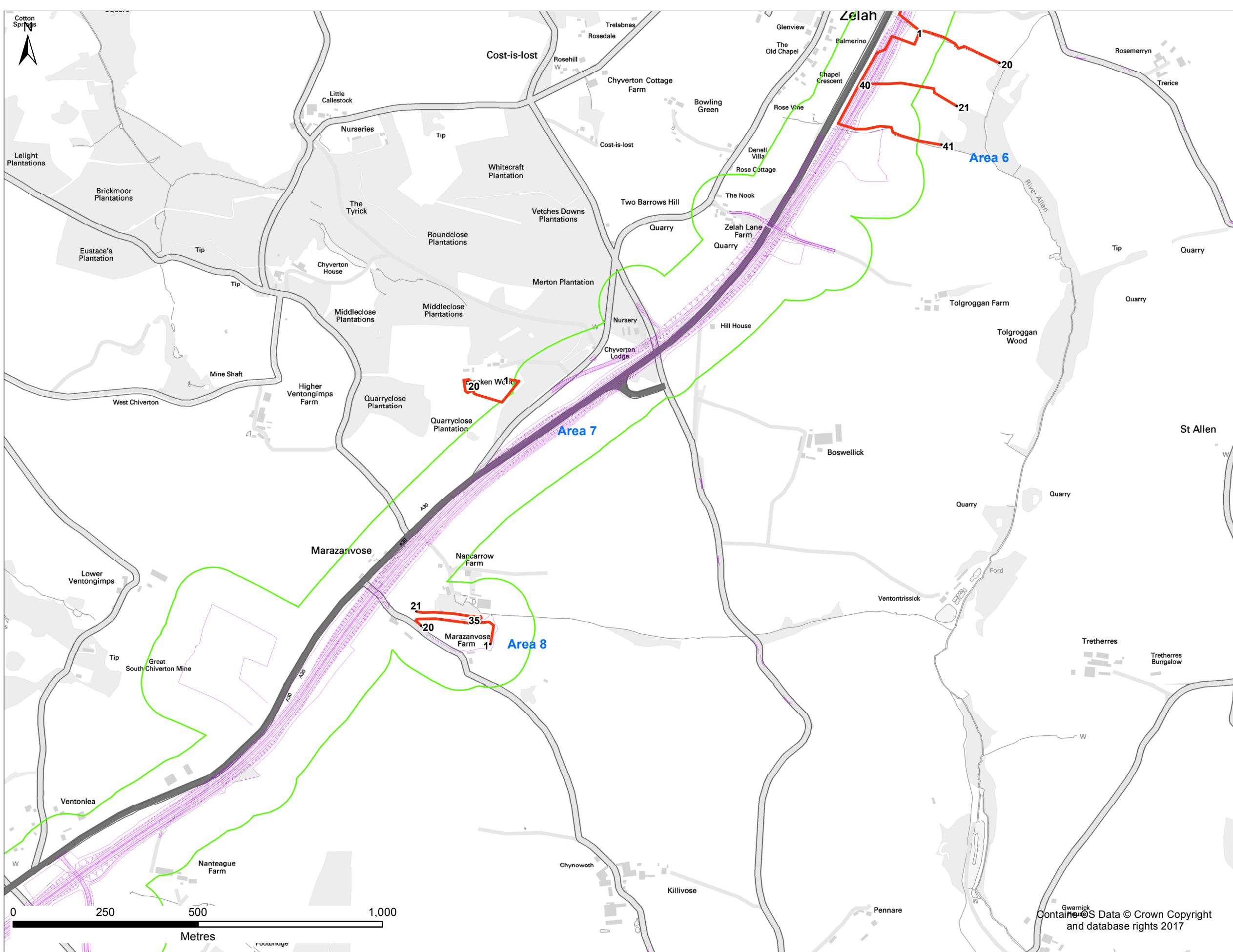
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Title: REPTILE SURVEY AREAS
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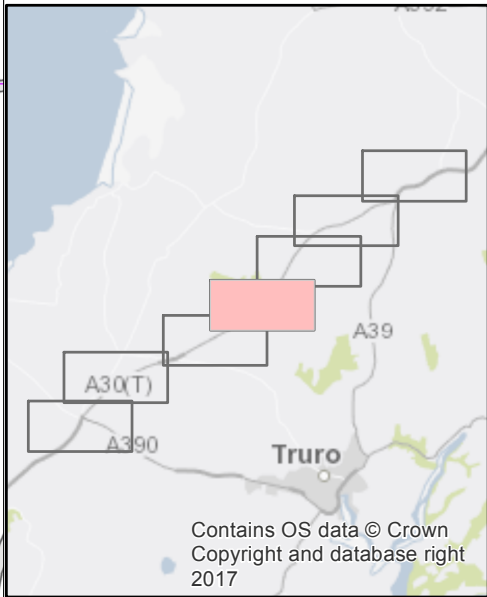
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- Survey Areas
- 100m Buffer
- Option 7A



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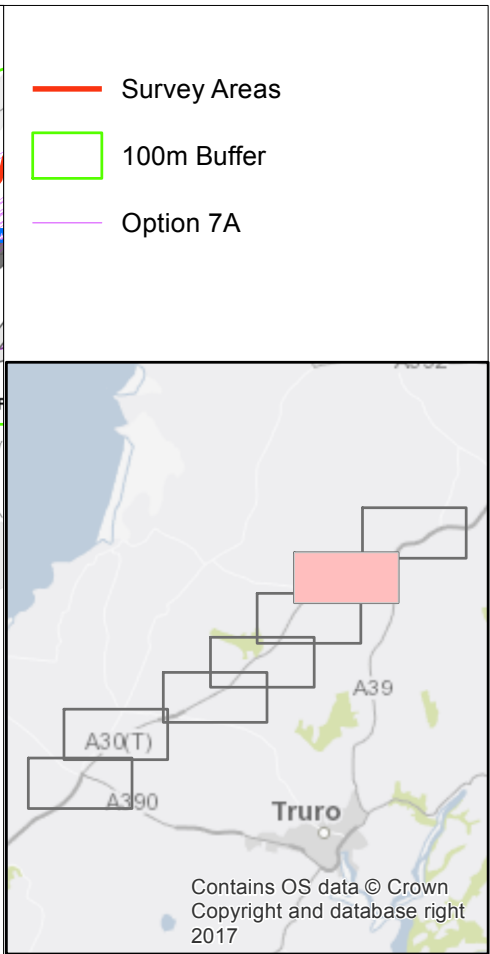
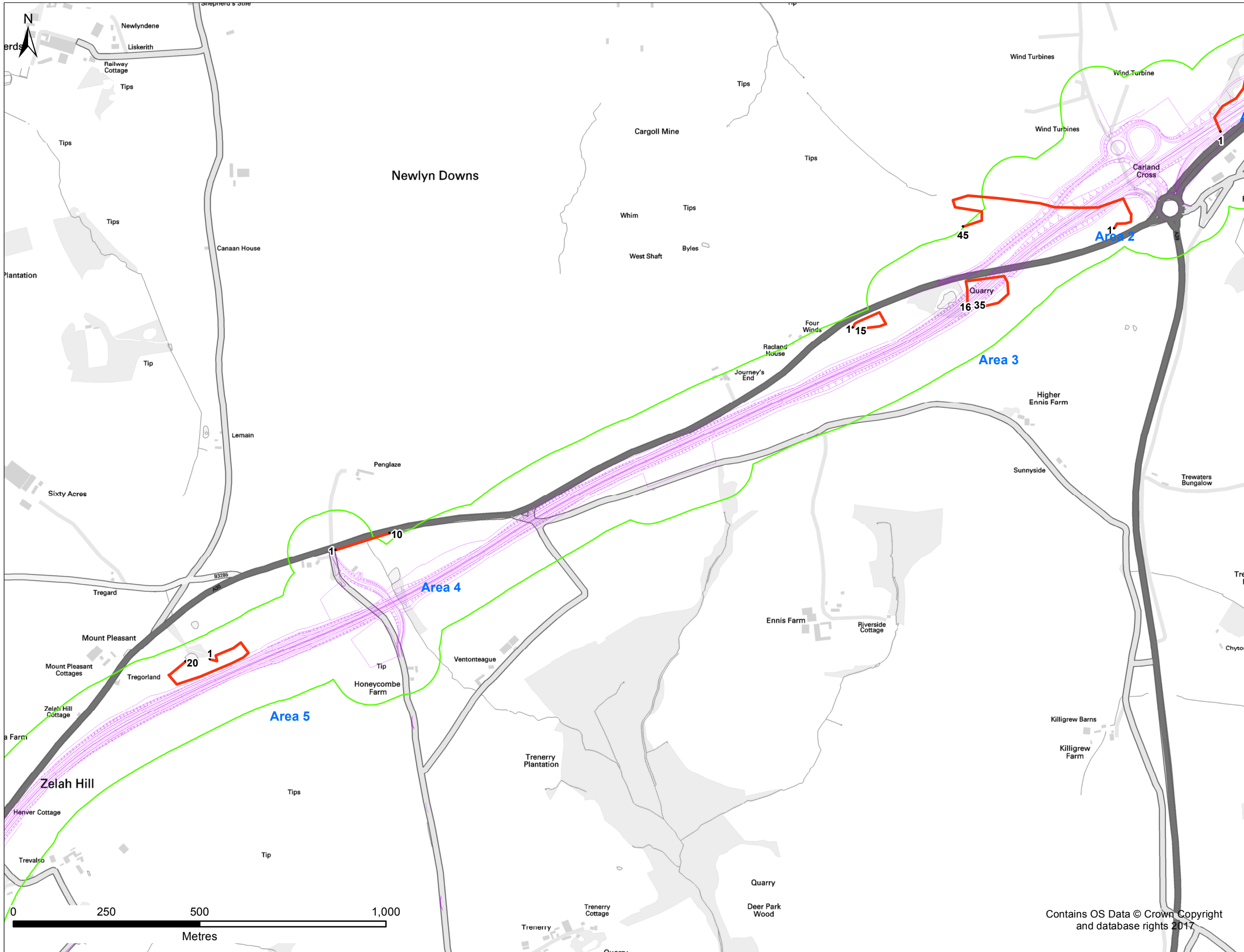
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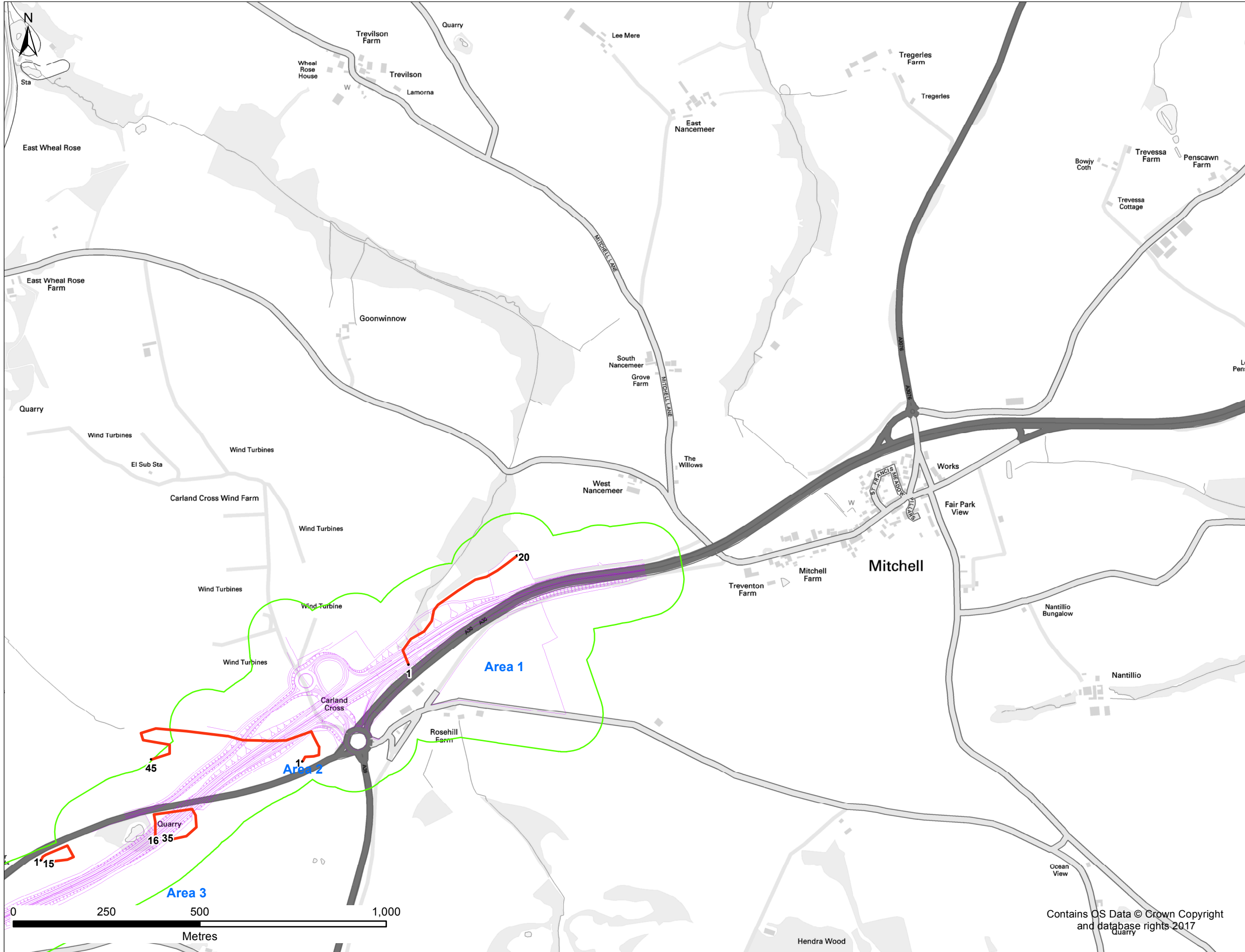
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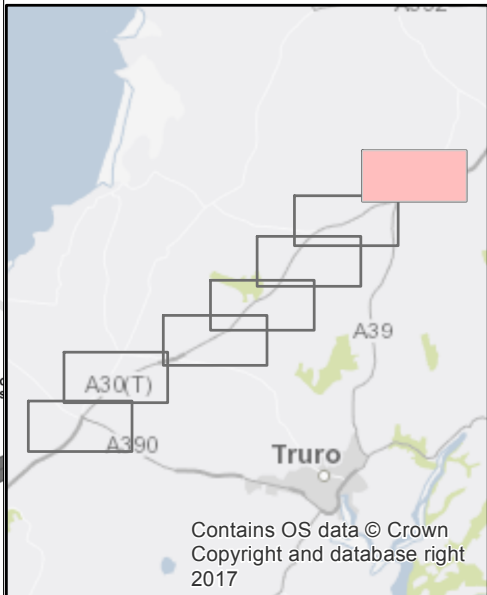
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- Survey Areas
- 100m Buffer
- Option 7A



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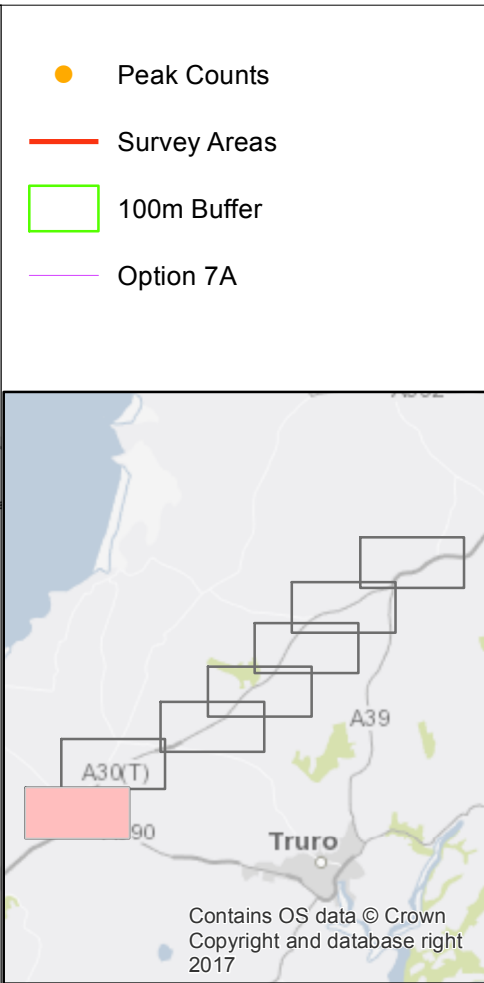
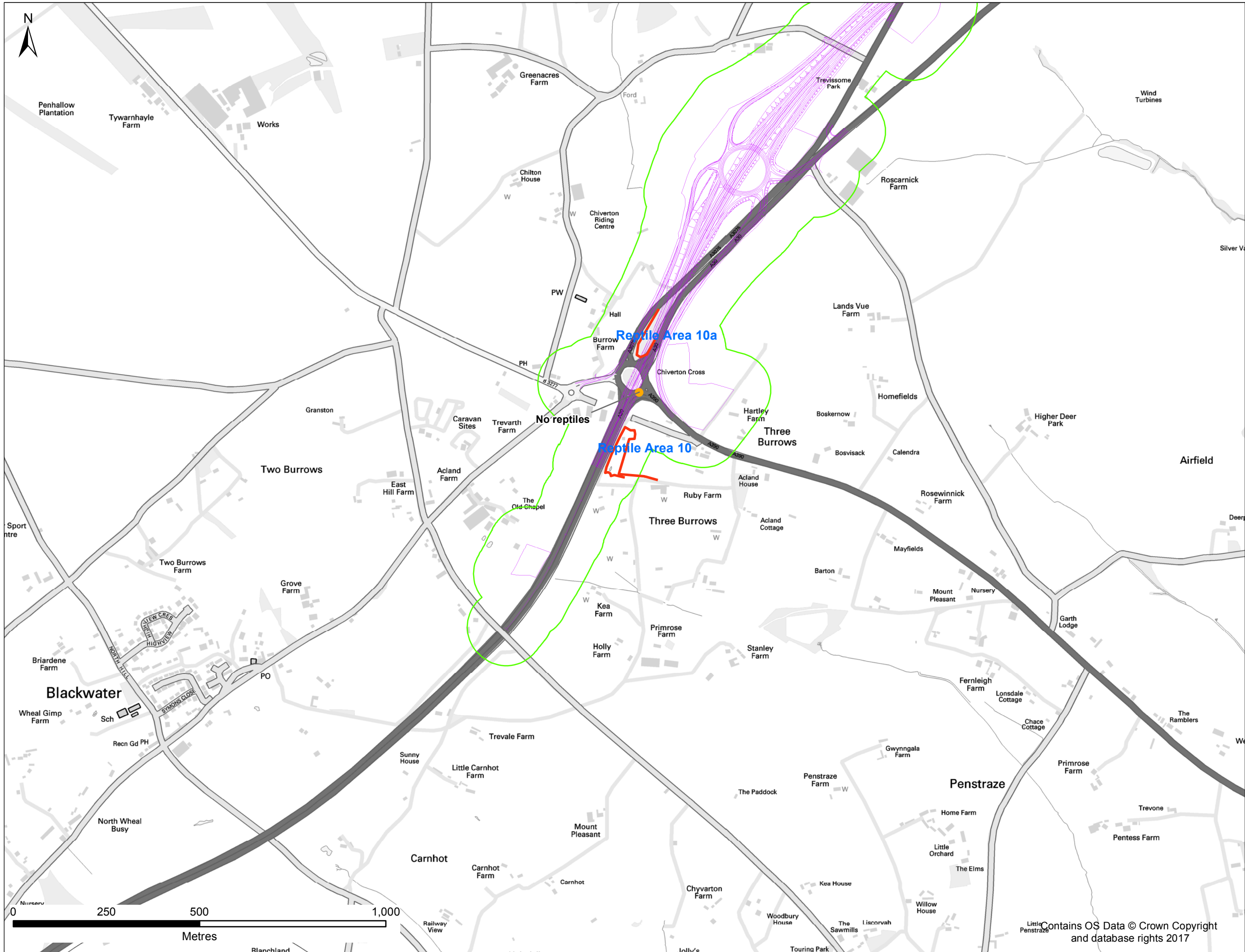
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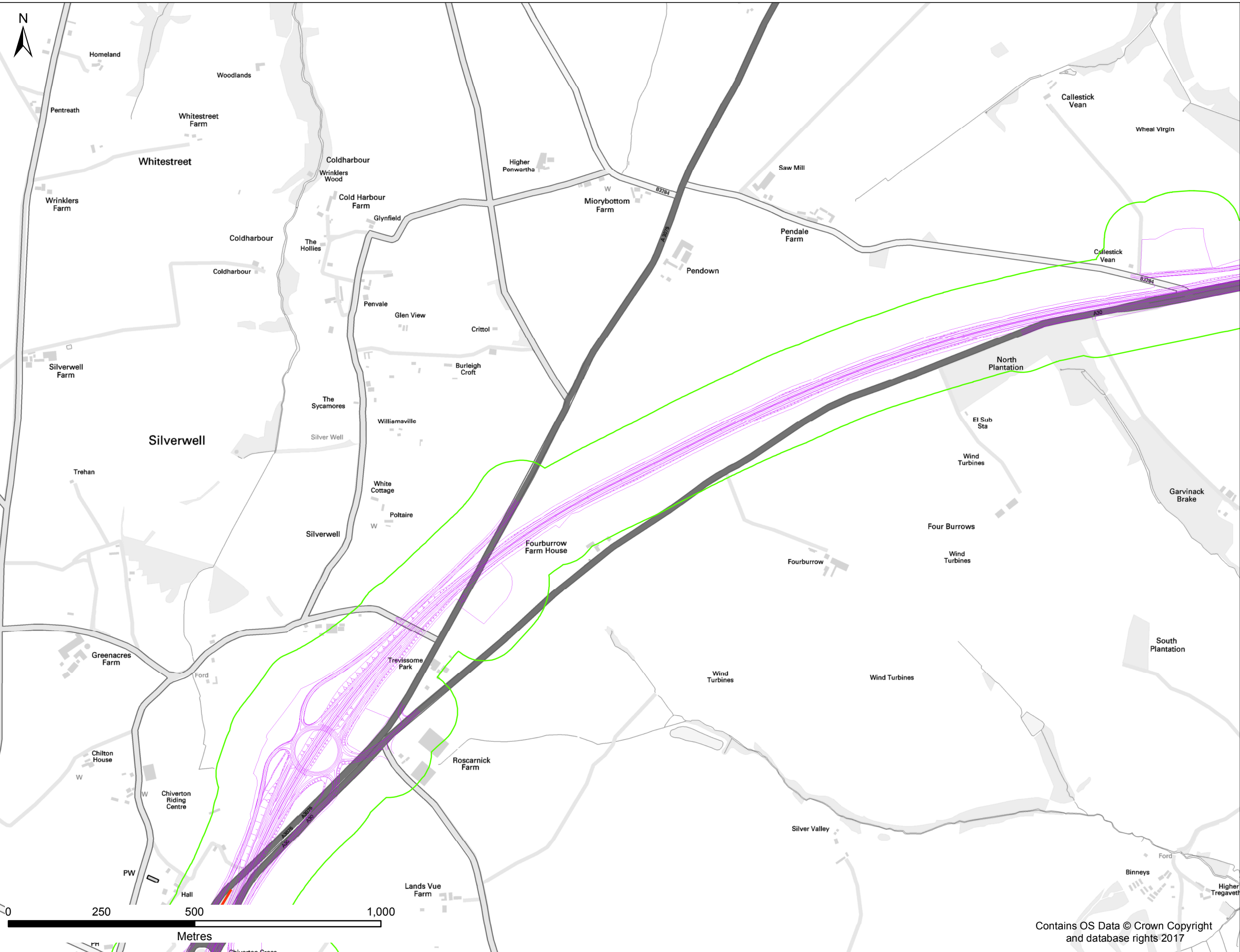
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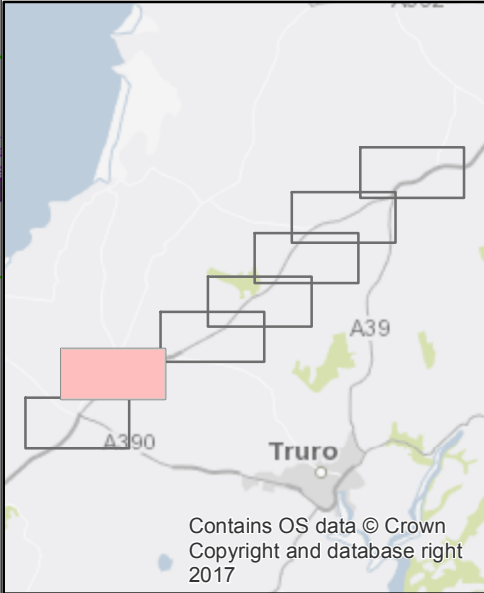
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- Peak Counts
- Survey Areas
- 100m Buffer
- Option 7A



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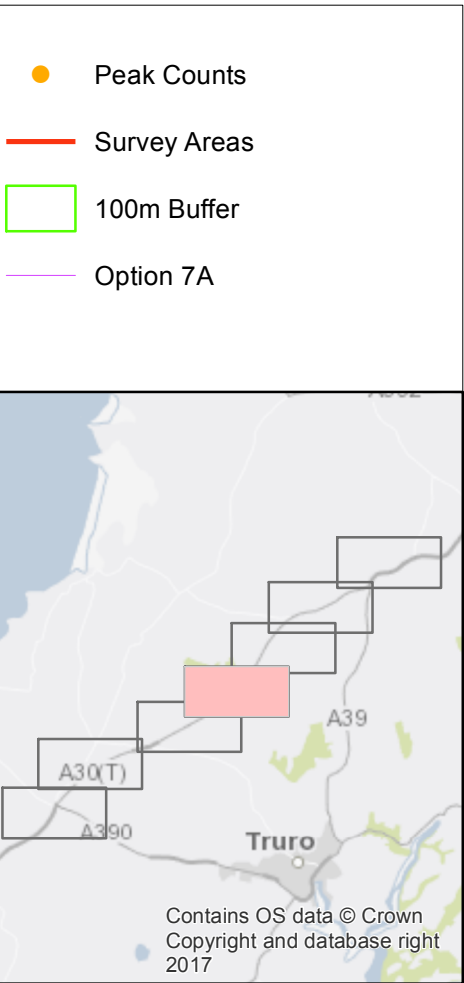
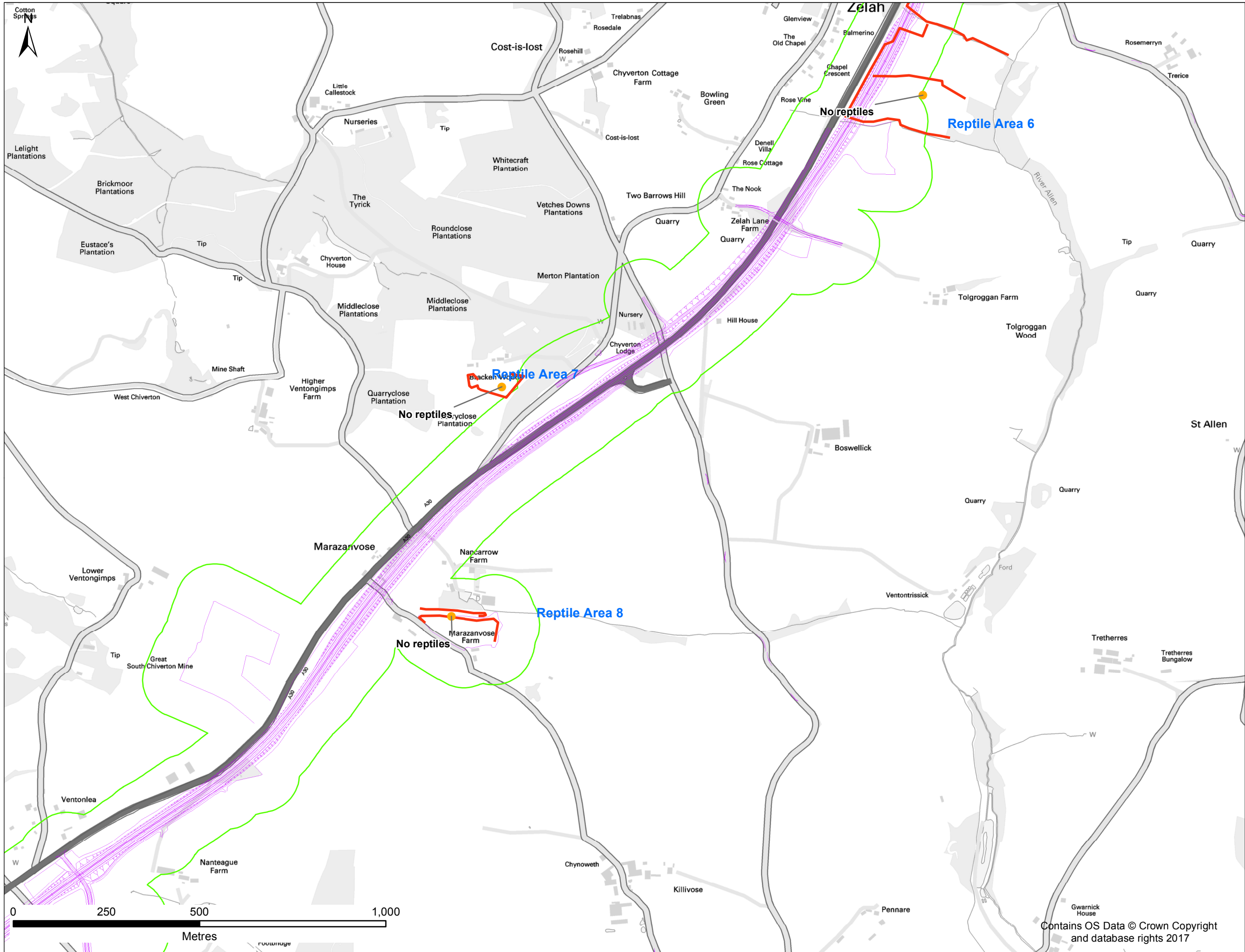
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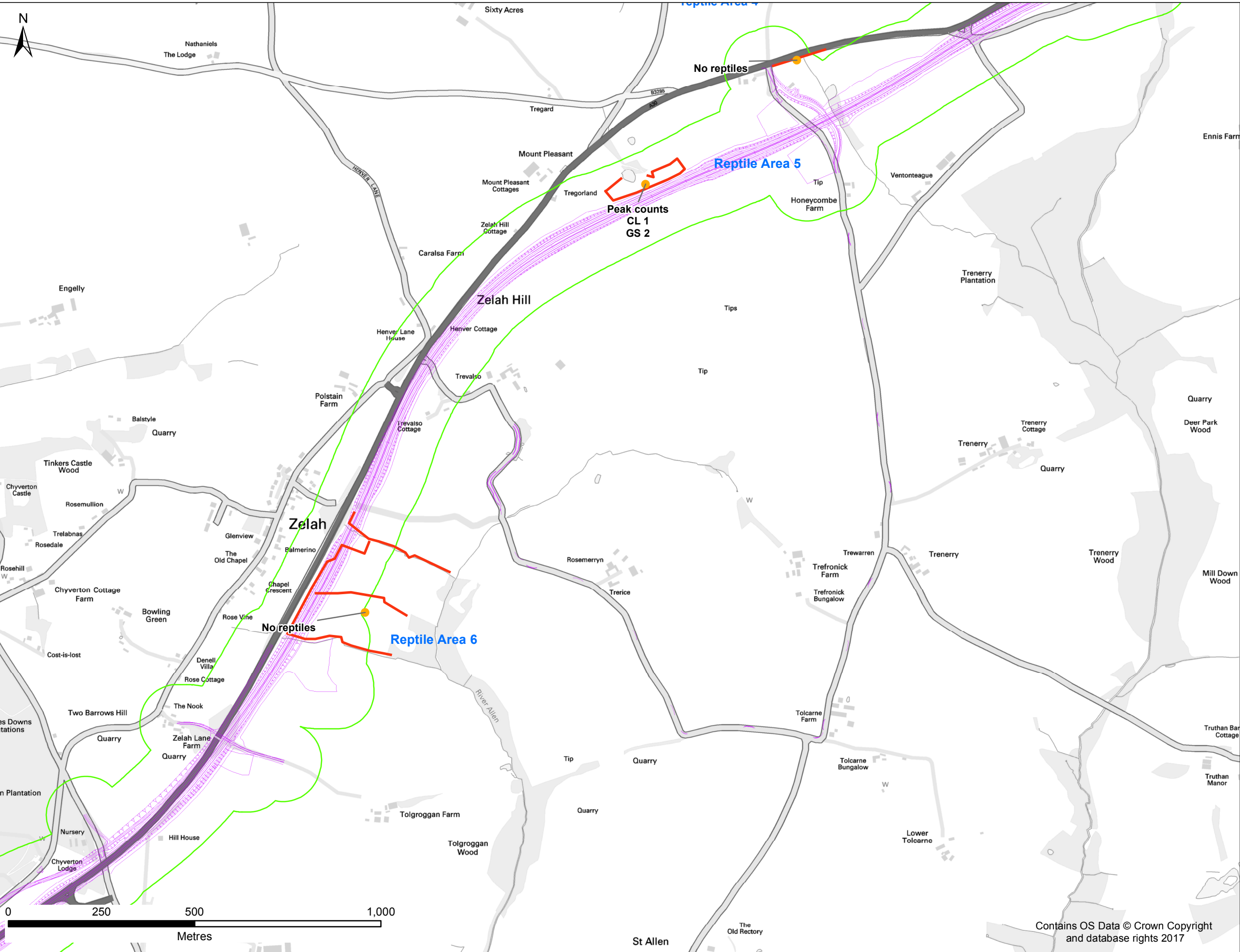
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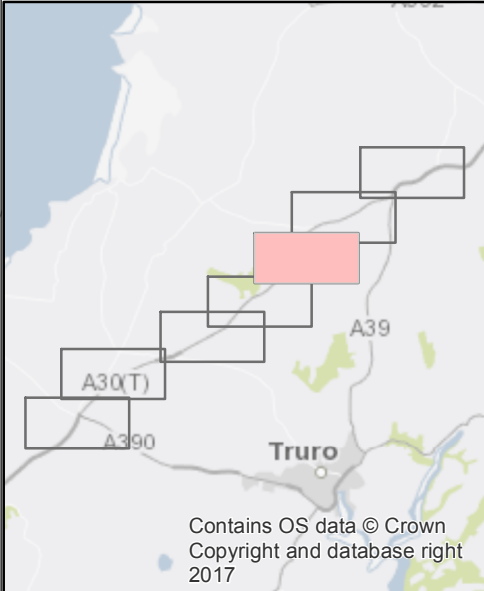
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- Peak Counts
- Survey Areas
- 100m Buffer
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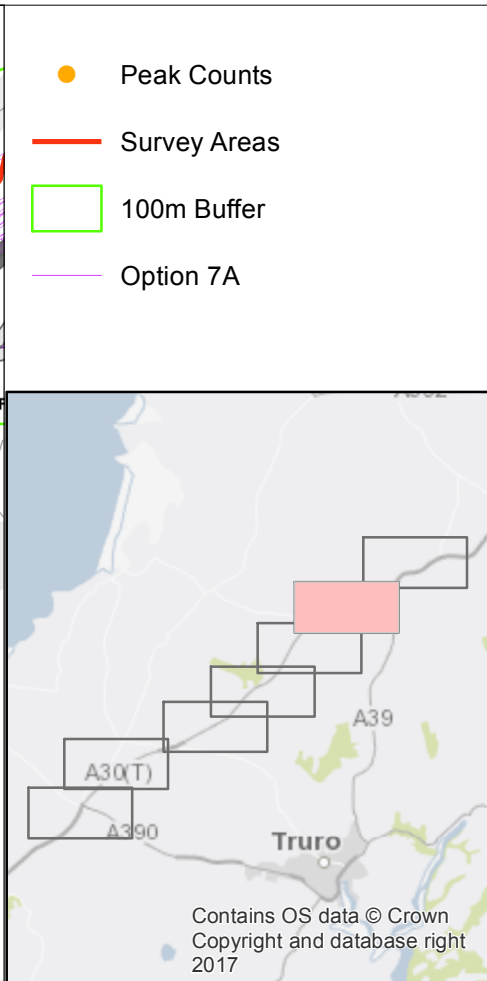
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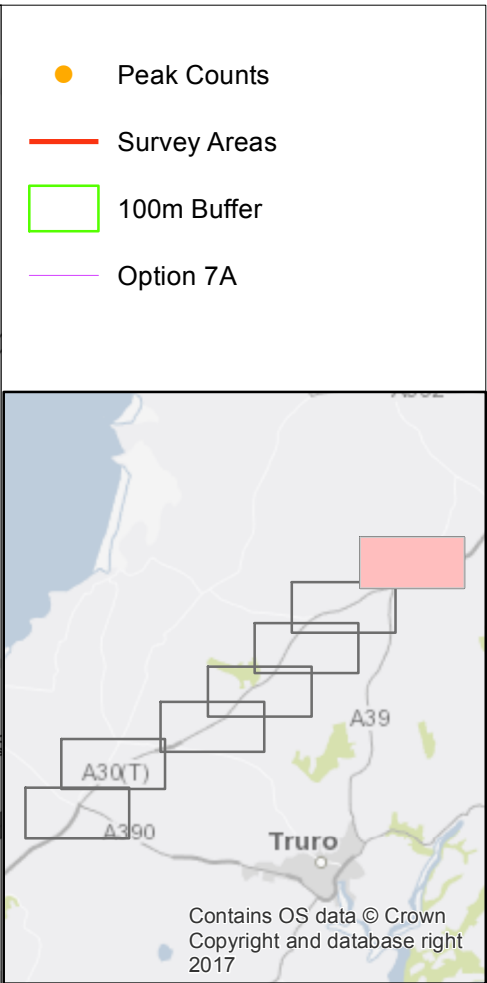
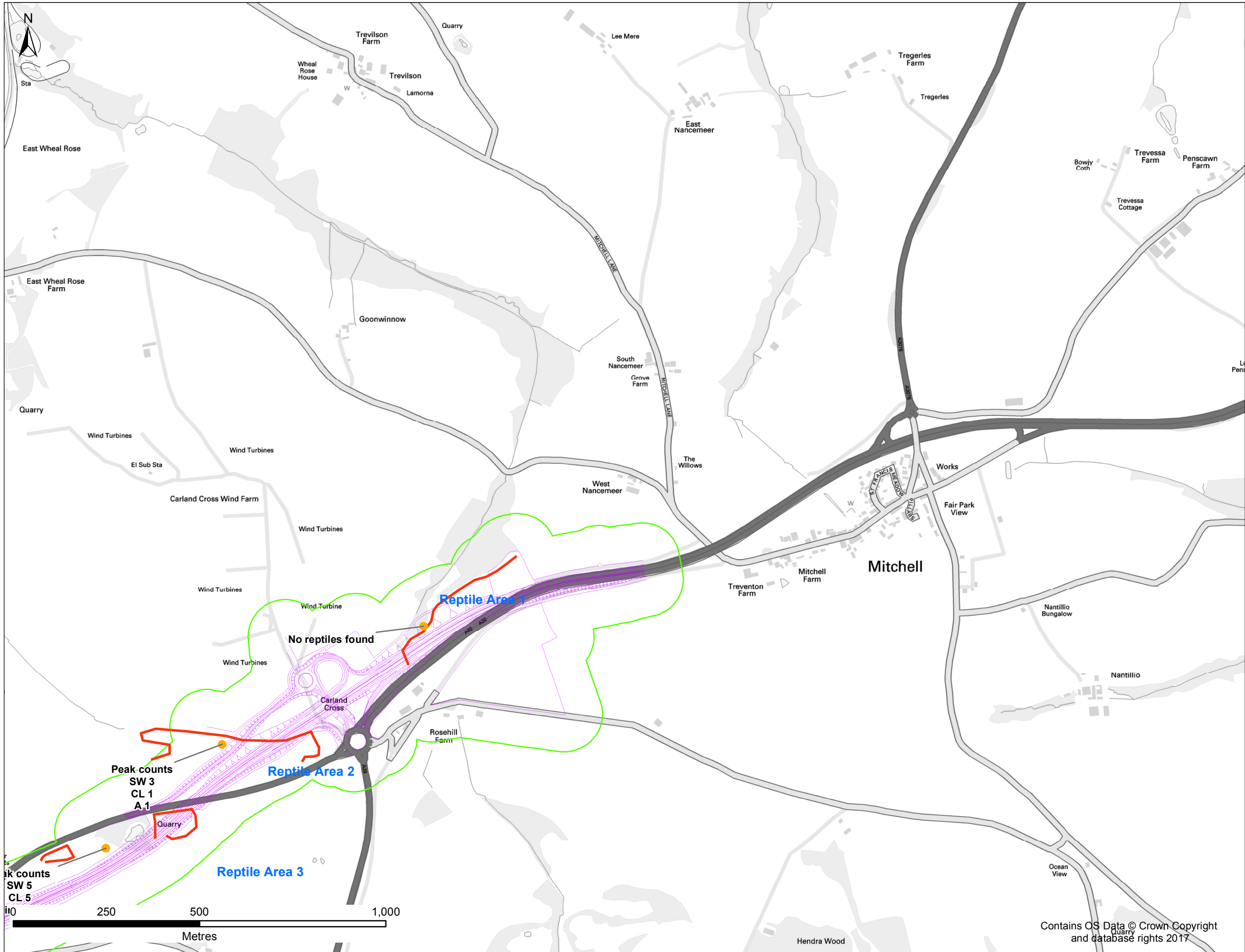
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