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A30 CHIVERTON CROSS TO CARLAND CROSS

NATIONAL VEGETATION CLASSIFICATION SURVEY REPORT

FINAL
Confidential

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TABLE OF CONTENTS

FIGURES

APPENDICES

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 were required in order to inform an Ecological Impact Assessment (EcIA) forming part of an Environmental Statement (ES) supporting a Development Consent Order (DCO) Application for the proposed Scheme.

1.1.2 The presence of habitats containing potentially notable botanical communities within, and in close proximity, to the proposed Scheme footprint was established during a Phase 1 Habitat Verification Survey[1] undertaken in August 2015. In addition, desk records confirmed the historic presence of notable plant species within the 5 km area surrounding the existing A30 between Chiverton Cross and Carland Cross. Accordingly, detailed botanical surveys were recommended.

1.1.3 The objective of the survey was to identify the presence of notable botanical communities within suitable habitats potentially affected by the proposed Scheme. If presence was confirmed, the results would enable the potential impacts 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.

1.2.2 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.

1.2.3 The area subject to scoping for botanical survey consisted of a 100 m area either side of the 12.7 km length of the proposed Scheme. Within this footprint, twelve areas were identified as potentially requiring further survey (this area is 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.

1.2.4 The proposed Scheme area covers a variety of habitats; predominately arable farmland, but also including areas of heathland, woodland, wetland and grassland.

1.2.5 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

1.3 BOTANICAL SURVEY

1.3.1 The 2015 Phase 1 Habitat Verification Survey identified the presence of grassland, heathland and woodland habitats within the development footprint, which were considered to have botanical interest[2]. Targeted botanical assessment of these habitats was recommended: to provide a robust ecology baseline; to enable the potential effects of the proposed Scheme to be established; and to allow mitigation measures to be developed. The targeted botanical assessments followed standard methodology devised by Joint Nature Conservation Committee (JNCC)[3]. Mitigation measures are considered within subsequent ES reporting and as such are not addressed within this report.

1.4 LEGISLATION

1.4.1 The key legislation and policy which provided the framework for undertaking this survey was as follows:

- Wildlife and Countryside Act 1981 (as amended); and
- Section 41 Natural Environment and Rural Communities Act 2006;

1.4.2 Certain plants are afforded protection under Schedule 8 Wildlife and Countryside Act 1981 (as amended).

1.4.3 Section 41 (S41) of the Natural Environment and Rural Communities Act 2006 ('the NERC Act') lists Species of Principal Importance (SPI) and Habitats of Principal Importance (HPI) for the conservation of biodiversity in England.

1.4.4 The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the NERC Act, to have regard to the conservation of biodiversity in England, when carrying out their normal functions[4].

[2] Grassland habitats are reported separately.
[3] Rodwell, J.S. (2006). National Vegetation Classification: Users' Handbook. Joint Nature Conservation Committee.
[4] Defra (2011). Biodiversity 2020: A strategy for England's wildlife and ecosystem services. Available from https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services

2 METHODOLOGY

2.1 DESK STUDY

2.1.1 As part of the 2015 Phase 1 Habitat Verification Survey, a desk study was undertaken for the proposed Scheme. Details on sites designated for their botanical interest, and protected and notable plant 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 100 m of the proposed Scheme have been accessed to inform this baseline report.

2.2 SURVEY SCOPING

2.2.1 Sites were scoped-in for targeted botanical survey where located within 100 m of the proposed Scheme and meeting the following criteria:

- Statutory and non-statutory nature conservation sites designated in full or in part for their botanical interest (identified through the desk study);
- Sites listed on the Ancient Woodland Inventory (AWI)[5] or Sites listed as HPIs[6] or sites that had the potential to support HPIs (noted as such during the 2015 Phase 1 Habitat Verification Survey) where the within 100 m of the proposed Scheme;
- Habitats containing desk study records of protected or notable SPI plant species within 100 m of the proposed Scheme.

2.2.2 The 100 m distance for assessment from the proposed Scheme was selected as this was considered to be a suitable extent for characterising the types of notable botanical habitats present and potentially affected by the proposed Scheme.

2.2.3 The distances used in the assessment were considered sufficient to account for any direct and potential indirect impacts during construction. Establishment of the survey area was also undertaken with reference to the air quality assessment progressed for the operational proposed Scheme. In accordance with the assessment of likely impacts as a result of air quality during operation[7], it was not considered necessary to extend the assessment beyond 100 m.

2.3 FIELD SURVEY

2.3.1 National Vegetation Classification (NVC) surveys were undertaken in accordance with best practice survey guidance[8] by surveyors competent in undertaking NVC survey. Plant species observed within each habitat type were recorded in accordance with plant species nomenclature in Stace

[5] https://data.gov.uk/dataset/priority-habitat-inventory-england2
[6] This was established through desk study using Priority Habitat Inventory (England) national dataset and species lists established during the Phase 1 Habitat Verification Survey.
[7] A30 Chiverton to Carland Cross Environmental Impact Assessment Scopign Report, May 2017. HA551502-WSP-EGN-0000-RE-EN-00004 P03.1 EIA Scoping
[8] Rodwell, J.S. (2006). National Vegetation Classification: Users' Handbook. Joint Nature Conservation Committee.

(2010)[9].

2.3.2 The area subject to the NVC survey comprised heathland and woodland habitats[10].

2.3.3 The heathland survey was undertaken on 24th to 25th August 2016. The woodland survey was undertaken on 9th, 10th and 11th May, and 22nd and 23rd August 2017. The surveys were undertaken by ecologists experienced and competent in botanical survey and identification.

2.3.4 The surveyors walked each survey area and identified stands of homogenous vegetation present. The extents of these homogenous stands were then mapped and representative samples were subject to survey.

Habitats Sampled

Heathland Habitats

2.3.5 Two separate sites were subject to heathland survey (Heathland Site 1 and Site 2).

2.3.6 Five 2 m x 2 m ground floral quadrat samples were marked out for each homogenous stand of vegetation present. The size of the quadrat sample was based on the NVC standard methodology for short, herbaceous vegetation and dwarf-shrub heath where 2 x 2 m is the recommended quadrat size. Where possible, five quadrats were chosen within a sample.

2.3.7 At Heathland Site 1, two of the three heathland 'Vegetation Types' identified ('Vegetation Type 1 heathland' and 'Vegetation Type 3 heathland') appeared floristically similar. However, these were divided into separate sample areas owing to the presence of cross-leaved heath *Erica tetralix* only occurring within 'Vegetation Type 3 heathland'. It was considered that the presence of this species may result in the habitat falling into a different sub-community.

Woodland Habitats

2.3.8 Twelve separate sites were subject to the woodland survey, with six of these taken forward for NVC. Woodland sites are labelled Woodland Site 1 – 12 within the results section of this report. Where an NVC was determined as not appropriate (within plantation woodland for example), a species list was taken and is reported separately within the Phase 1 Habitat Survey Update Report[11].

2.3.9 Within the woodland habitats surveyed, quadrats of 4 m x 4 m were used to sample the ground flora and field layer.

2.3.10 Quadrats of 50 m x 50 m were used to sample the canopy and understorey layer, as recommended by standard methodology in Rodwell (2006)[12].

2.3.11 For some of the smaller woodlands, the quadrat for the canopy and understorey layers was smaller than the 50 m x 50 m quadrat size recommended by standard methodology in Rodwell (2006)[13]. In these instances, the accessible woodland areas were surveyed in their entirety.

2.3.12 Homogenous stands of vegetation were identified and sampled with up to five quadrats per stand.

[9] Stace, C.A. (2010). New Flora of the British Isles (3rd edition). Cambridge University Press, Cambridge.
[10] The grassland NVC is reported separately.
[11] WSP (2017). A30 Carland Cross to Chiverton Cross Phase 1 Habitat Survey Update. A Report to Highways England
[12] Rodwell, J.S. (2006). National Vegetation Classification: Users' Handbook. Joint Nature Conservation Committee
[13] Rodwell, J.S. (2006). National Vegetation Classification: Users' Handbook. Joint Nature Conservation Committee

Quadrats were recorded in representative vegetation stands.

2.3.13 Within each quadrat all species were recorded with an estimate of percentage cover and abundance using the Domin scale (Table 2.1).

Table 2.1: Domin scale

COVER / ABUNDANCE	DOMIN SCORE
91-100%	10
76-90%	9
51-75%	8
34-50%	7
26-33%	6
11-25%	5
4-10%	4
<4% (many individuals)	3
<4% (several individuals)	2
<4% (few individuals)	1

2.3.16 Plant species were named in accordance with Stace (2010)[14] except for the naming of NVC communities which is based on some now superseded scientific names for certain plant species used by Rodwell (1991, *et seq*)[15].

2.3.17 Data was analysed to provide a 'best' approximation to a published NVC type.

2.3.18 The data recorded in the quadrats from each homogenous stand of vegetation was tabulated and a constancy value for each species was calculated for each defined group of quadrats. Frequency tables were then produced to assign the vegetation types to one of the published plant community types through use of the keys provided in Rodwell (1991, *et seq*)[15] and supplemented by use of the computer software MAVIS (Modular Analysis of Vegetation Information System) provided by the Centre for Ecology and Hydrology (CEH) (Version 1.03)[16].

2.3.19 For each sample, results were tabulated to provide figures for cover expressed as a Domin value, range and constancy of occurrence across the five (or less) quadrats. For example, if heather *Calluna vulgaris* was found in two quadrats out of the five sampled, and the Domin score in these quadrats was 6 and 7 respectively, this means that the range of this species is 6 to 7.

[14] Stace, C.A. (2010). New Flora of the British Isles (3rd edition). Cambridge University Press, Cambridge.
[14] The grassland NVC is reported separately.
[15] Rodwell, J.S. (1991 *et seq*). *British Plant Communities*. Published in Five Volumes. Cambridge University Press, Cambridge.
[16] Modular Analysis of Vegetation Information System (Version 1.03). Available at https://www.ceh.ac.uk/services/modular-analysis-vegetation-information-system-mavis - accessed December 2016

2.3.20 The term frequency is used to describe how often a species is encountered in different stands or samples of a vegetation type, irrespective of species cover each stand or sample. It is summarised in floristic tables using the Roman numerals I-V and referred to in descriptions of vegetation types using the terms listed in Table 2.2 below:

Table 2.2: Domin scale

FREQUENCY CLASS	RANGE OF FREQUENCY CLASS	TERMS USED TO DESCRIBE FREQUENCY CLASS
I	1-20% (i.e. 1 stand in 5)	Scarce
II	21-40%	Occasional
III	41-60%	Frequent
IV	61-80%	Constant
V	81-100%	Constant

2.3.21 This information was then used in conjunction with the key in British Plant Communities in Rodwell (1991)[17],[18] to assign the most closely corresponding NVC community type based on the range and frequency of plant species within each plot.

2.4 *ERICA CILIARIS* SURVEY

2.4.1 Owing to the possible presence of Dorset heath *Erica ciliaris* within the survey area, the heathland survey was extended to identify the presence of Dorset heath. The survey method consisted of two surveyors searching the survey area for the presence of the plant.

2.4.2 Dorset heath is a nationally rare and Red Data Book (RDB) plant. Heathlands containing Dorset heath and cross-leaved heath are generally found on acid soils with slightly impeded drainage, although in Cornwall they extend onto dry soils[19]. Heathland sites containing these species can be selected as priority Annex 1 habitat of the European Community Directive 92/43/EEC under the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive) where they meet the 'Temperate Atlantic Wet Heath with *Erica ciliaris* and *Erica tetralix*' classification. Using the NVC[20] this habitat is described by H4 *Ulex galli - Agrostis curtisii* heath community. Therefore, the presence of this plant within the heathland fragment would allow comparison with nearby designated sites. This includes, in particular, the Newlyn Downs Special Area of Conservation (SAC) to the north of the proposed Scheme and an area to the south of the proposed Scheme forming part of the Carrick Heath Site of Special Scientific Interest (SSSI). Both of the designated heathland sites are known to support the RDB plant Dorset heath.

2.4.3 Where the plant was recorded, a grid reference was taken, along with a description of the stand, stand size, a photograph and any associated species.

2.5 LIMITATIONS

2.5.1 The surveys were carried out within the optimal survey period for each habitat type and were

[17] Rodwell, J.S (1991); British Plant Communities Volume 2: Mires and Heaths; Cambridge University Press.
[18] Rodwell, J.S (1991); British Plant Communities Volume 1: Woodlands and Scrub; Cambridge University Press.
[19] http://jncc.defra.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H4020 – accessed December 2016
[20] Rodwell, J.S. (1991 *et seq*); British Plant Communities. Published in Five Volumes. Cambridge University Press, Cambridge.

therefore considered to provide a representative list of species likely to be present.

2.5.2 The woodland at Site 6A was surveyed in August 2017 due to problems with access preventing earlier admittance. Whilst this is still within the optimal survey window, this is likely to have reduced the ability of the surveyors to identify some spring flowering woodland species. Whilst it is still possible to assign the habitat to a community, this could cause problems assigning to sub-community level. This is addressed via a precautionary approach to the allocation to the NVC community.

2.5.3 It was not possible to access the woodland parcel located to the south of Chiverton Reserve during the woodland NVC survey (Sites 6B and 6E). However, species lists were taken from the roadside. In addition, Site 2B was not subject to NVC survey. This site formed part of a woodland-grassland complex and very few exclusive woodland species were found present. A full species list was, however, obtained during the grassland NVC survey. Areas 2B, and 6E will not be directly affected by the Scheme; however a small section of Area 6B is within the footprint of the proposed Scheme. It is considered that precautionary assessments will need to be applied to mitigation or compensation proposals in these areas. The need for mitigation or compensation as a result of impacts to Sites 2B and 6E will be confirmed pending the results of further studies detailing the extent of likely hydrological and air quality impacts in this location and will be captured within subsequent ES reporting.

2.5.4 The canopy of woodlands at Woodland Site 3 and Woodland Site 7 were surveyed in their entirety owing to the small size of these woodlands. This was deemed satisfactory for obtaining a representative sample of the woodland.

2.5.5 Non-native and introduced species were recorded within some of the woodlands (at Site 6A for example). Introduced species cannot be included when carrying out NVC analysis and may affect the affinity of data collected within these habitats to recognised NVC categories. This is accounted for where applicable in the reasoning presented below in the results sections.

2.5.6 Some of the woodlands were very variable in terms of their uniformity and displayed different elements of NVC community or sub-community. Where relevant, this is discussed in the results.

3 RESULTS

3.1 NVC DESK STUDY

3.1.1 The results of the full desk study detailing notable and protected plant species within 5 km of the existing A30 between Chiverton Cross and Carland Cross can be found in the 2015 Phase 1 Habitat Verification Survey.

3.1.2 Those records of relevance to the botanical baseline presented in this report are described in Section 3.2 below.

3.2 SCOPING

3.2.1 Table 3.1 and Figure 1 detail the habitats scoped in for targeted botanical survey.

3.2.2 Statutory or non-statutory designated sites are not located within the study area.

3.2.3 A single heathland and six woodland HPIs were identified within 100 m of the proposed Scheme[21].

3.2.4 Two non-statutory designated heathland habitats comprising (Cornwall) Roadside Verge Inventory Sites (CRVIS) were identified within 100 m of the proposed Scheme. At the time of survey, CRVIS BS315 was no longer in existence due to junction improvement works being undertaken (unrelated to the proposed Scheme).

3.2.5 The desk study returned no records of protected or notable SPI plant species or woodlands listed on the AWI within 100 m of the proposed Scheme.

3.2.6 Table 3.1 also provides details of all scoped out woodland and heathland habitats located within 100 m of the Scheme.

3.2.7 Figure 1 and Table 3.1 provide the locations and details of both scoped-in and scoped-out sites. Species lists are provided separately within the Phase 1 Habitat Survey Update Report[22] for all scoped out sites.

Table 3.1 Assessment of Sites for NVC

Site	Description	Scoped result	Rationale
Heathland			
Site 1	Heathland fragment	Yes	Listed on Priority Habitat Inventory as HPI, highlighted as containing habitats floristically similar to those found on Newlyn Downs during 2015 Phase 1 Habitat Verification Survey. Proposed Scheme will result in direct habitat loss. Presence of *Erica ciliaris* (notable plant species) recorded.

[21] In this report, only woodland and heathland habitats are presented. However, no other HPIs were identified within 100 m of the proposed Scheme.
[22] WSP (2017). A30 Carland Cross to Chiverton Cross Phase 1 Habitat Survey Update. A Report to Highways England

Site	Description	Scoped result	Rationale
Site 1 (woodland within Site 1 heathland)	Small unit of plantation woodland	No	Coniferous woodland plantation. Plantation woodland is not a natural habitat and therefore would not fit into an NVC community.
Site 2	Newlyn Downs	No	Located > 100 m distant from the proposed Scheme. However, the site is a SAC/SSSI, listed on Priority Habitat Inventory as HPI and was surveyed to enable a comparison against the vegetation communities recorded within Site 1. Survey results are presented within this report for context only.
Woodland			
Site 1	Deciduous woodland (divided into two stands during survey)	Yes	Listed on Priority Habitat Inventory as HPI, proposed Scheme will result in direct habitat loss.
Site 2a	Cornish hedge	No	Hedgerows reported separately.
Site 2b	Deciduous woodland	No	Small section of woodland-grassland complex within 100 m of the proposed Scheme with few exclusive woodland plants present. Ground flora reported separately within grassland NVC report. Tree species list provided separately.
Site 3	Deciduous woodland	Yes	Listed on Priority Habitat Inventory as HPI, proposed Scheme will result in direct habitat loss.
Site 4	Plantation woodland	No	Not listed on Priority Habitat Inventory as HPI. Plantation woodland is not a natural habitat and therefore would not fit into an NVC community. Species list provided separately.
Site 5	Plantation woodland	No	Not listed on Priority Habitat Inventory as HPI. Plantation woodland is not a natural habitat and therefore would not fit into a NVC community. Species list provided separately.
Site 6A	Deciduous / plantation woodland (spilt into stands owing to large size and vegetation communities present)	Yes (Stand 1 & 2). No (Stand 2 & 3)	Listed on Priority Habitat Inventory as HPI and located < 100 m from proposed Scheme.
Site 6B	Plantation woodland	No	Listed on Priority Habitat Inventory as HPI. Access limitations. Part of woodland found to be a garden during the survey therefore species list taken of outer woodland extent only (reported separately).
Site 6C	Plantation woodland	No	Not listed on Priority Habitat Inventory as HPI. Low species diversity and difficulties with accessibility. Plantation woodland is not a natural habitat and therefore would not fit into NVC community. Species list provided separately.
Site 6D	Deciduous woodland corridor	No	Not listed on Priority Habitat Inventory as HPI, very narrow corridor of woodland only a small section < 100 m from proposed Scheme. Species list provided separately.
Site 7A	Deciduous woodland		

Site	Description	Scoped result	Rationale
		Yes	Listed on Priority Habitat Inventory as HPI and located < 100 m from proposed Scheme. .
Site 7B	Deciduous woodland corridor / field boundary	No	Not listed on Priority Habitat Inventory as HPI. Narrow corridor, too small to sample using the NVC method.
Site 7C	Plantation woodland	No	Not listed on Priority Habitat Inventory as HPI. Relatively recent plantation woodland. Plantation woodland is not a natural habitat and therefore would not fit into NVC community.
Site 8	Deciduous woodland	Yes	Listed on Priority Habitat Inventory as HPI; proposed Scheme will result in direct habitat loss.
Site 9	Deciduous woodland	No	Not listed on Priority Habitat Inventory as HPI and narrow corridor of woodland, access limitations.
Site 10	Mosaic of deciduous and plantation woodland	No	Not listed on Priority Habitat Inventory as HPI and narrow corridor of young woodland. Woodland plantation is not a natural habitat and therefore would not fit into NVC community.
Site 11	Mosaic of deciduous and plantation woodland units	Yes	Part of the woodland listed on Priority Habitat Inventory as HPI and located <100 m from proposed Scheme. Species list taken in sections too small for NVC (reported separately).
Site 12	Plantation woodland (isolated unit)	No	Not listed on Priority Habitat Inventory as HPI and narrow corridor of immature woodland. Plantation woodland is not a not a natural habitat and therefore would not fit into NVC community.

3.3 FIELD SURVEY: HEATHLAND NVC

3.3.1 The homogenous habitat types recorded are described below. Corresponding tables detailing species recorded, Domin score and frequency class are provided in Appendix A. Quadrat locations and extent of NVC habitats are shown on Figure 2.

HEATHLAND SITE 1 - VEGETATION TYPE 1 HABITAT

3.3.2 Vegetation Type 1 Habitat comprised a dry stand dominated by dwarf shrub species, namely *Ulex gallii, Calluna vulgaris* and *Erica cinerea*, which formed the constant species. Grass (graminoid) species, *Molinia caerulea* and *Agrostis curtisii* were recorded as occasional and scarce within the quadrats. Herbs were limited, with *Potentilla erecta* noted in quadrat 5 and occasionally in the wider habitat located outside the quadrats.

3.3.3 The data collected keyed out using Rodwell (1991)[23] as ***H4 Ulex gallii – Agrostis curtisii*** **heath**. This is a dwarf heath habitat confined to the warm oceanic parts of south-west Britain where it occurs on a variety of moist, acid soils.

[23] Rodwell, J.S (1991); British Plant Communities Volume 2: Mires and Heaths; Cambridge University Press.

3.3.4 Analysis of the quadrat data using MAVIS returned a result of 64.64% for the H8a *Calluna vulgaris - Ulex gallii* heath, species-poor sub-community. This was rejected as H8a typically lacks *Molinia caerulea* and *Agrostis curtisii* which were present within the quadrats. The quadrats also lacked some of the other characteristic species within the H8a sub-community, such as *Agrostis capillaris* and *Festuca ovina*. The next result generated by MAVIS was the H4a *Ulex gallii – Agrostis curtisii* heath, *Agrostis curtisii-Erica cinerea* sub-community (59.65 %). This was rejected as *A. curtisii* is typically dominant in this sub-community, however was scarce within the sample. The H4c *Ulex gallii – Agrostis curtisii* heath, *Erica tetralix* sub-community was returned next by MAVIS (53.45 %). However, this was rejected owing to a lack of *Erica tetralix* within the quadrats. MAVIS returned a result of 52.79 % for the H4 vegetation community which is a high coefficient and was accepted over the H8 community owing the species present.

3.3.5 In summary, using a combination of Rodwell (1991)[24] and statistical analysis from MAVIS Vegetation Type 1 Habitat shows an affinity to the H4 *Ulex gallii – Agrostis curtisii* heath. Low assemblages of *Agrostis curtisii* and an absence of *Erica tetralix* meant that it was not possible to key out to the sub-community level (H4a and H4c, respectively). The extent of this vegetation community is shown on Figure 2.

3.3.6 Frequency tables are provided within Table 4.1 Appendix A.

HEATHLAND SITE 1 - VEGETATION TYPE 2 HABITAT

3.3.7 Vegetation Type 2 Habitat comprised a dry, graminoid-dominated stand with occasional ericaceous (heather) species, located along the western extent of the survey area (refer to Figure 2). Graminoids were recorded in a higher abundance than in the previous sample (Vegetation Type 1 Habitat), particularly *Agrostis curtisii* which formed a constant species.

3.3.8 The data collected keyed out using Rodwell (1991)[25] as **H4a *Ulex gallii – Agrostis curtisii* heath, *Agrostis curtisii-Erica cinerea* sub-community**. *Rubus fruticosus* agg. and *Teucrium scorodonia* were recorded within the quadrats; species indicative of ground disturbance or burning which was evident within the quadrats. This sub-community occurs throughout the range of H4 and is often present as regenerating vegetation after burning.

3.3.9 Analysis of the quadrat data using MAVIS returned a result of 67.68 % for the H4a *Ulex gallii – Agrostis curtisii* heath, *Agrostis curtisii-Erica cinerea* sub-community. This supports the results keyed out in Rodwell (1991)[26] and attributing Vegetation Type 2 Habitat to the H4a sub-community. The dominance of *Agrostis curtisii* along with the presence of *Molinia caerulea* within the quadrats (both constant species) supports this analysis. The H4 *Ulex gallii – Agrostis curtisii* heath was returned next by MAVIS (63.67 %). This was rejected owing to the high graminoid presence within the quadrats which is more representative of the H4a sub-community. This was followed by the H4c *Ulex gallii – Agrostis curtisii* heath, *Erica tetralix* sub-community (60.15 %), which was also rejected owing to a lack of *Erica tetralix*.

3.3.10 In summary, Vegetation Type 2 Habitat shows an affinity to the H4a *Ulex gallii – Agrostis curtisii* heath, *Agrostis curtisii-Erica cinerea* sub-community. This is supported by a combination of Rodwell (1991)[27] and statistical analysis from MAVIS. The extent of this vegetation community is shown on Figure 2.

[24] Rodwell, J.S (1991); British Plant Communities Volume 2: Mires and Heaths; Cambridge University Press.
[25] Rodwell, J.S (1991); British Plant Communities Volume 2: Mires and Heaths; Cambridge University Press.
[26] Rodwell, J.S (1991); British Plant Communities Volume 2: Mires and Heaths; Cambridge University Press
[27] Rodwell, J.S (1991); British Plant Communities Volume 2: Mires and Heaths; Cambridge University Press.

3.3.11 Frequency tables are provided within Table 4.2 Appendix A.

HEATHLAND SITE 1 - VEGETATION TYPE 3 HABITAT

3.3.12 Vegetation Type 3 Habitat was located to the east of the survey area (refer to Figure 2) and comprised a dry, ericoid (heather) dominated stand with *Erica tetralix* featuring throughout. The presence of *E. tetralix* indicated a transition from the vegetation communities and sub-communities, recorded within Vegetation Type 1 and 2 Habitats.

3.3.13 The data collected keyed out using Rodwell (1991)[28] as **H4c *Ulex gallii – Agrostis curtisii* heath, *Erica tetralix* sub-community**. The high levels of *Erica tetralix* in the quadrats enabled the sub-community to be keyed out in Rodwell (1991)[29] and were considered representative of the data collected.

3.3.14 Analysis of the quadrat data using MAVIS returned a result of 63.31% for the H2c *Calluna vulgaris - Ulex minor* heath, *Molinia caerulea* sub-community. This was rejected owing to the absence of *Ulex minor* which is constant within H2 and its sub-communities. The dominance of *Calluna vulgaris* and the presence of *Molinia caerulea* within the quadrats are likely to have generated this MAVIS result. Furthermore, MAVIS returned several H4 communities including H4a and H4c at good coefficients which were considered more representative of the vegetation within the quadrats. The H4c sub-community was returned next (61.25 %) which was selected as most representative of the habitat and supported the findings keyed out in Rodwell (1991)[30]. The H4a *Ulex gallii – Agrostis curtisii* heath, *Agrostis curtisii-Erica cinerea* sub-community returned a result of 61.22 %. This was rejected in favour of the H4c sub-community owing the presence of *Erica tetralix*.

3.3.15 In summary, Vegetation Type 3 Habitat is considered to show an affinity to the H4c *Ulex gallii – Agrostis curtisii* heath, *Erica tetralix* sub-community. This is supported by a combination of Rodwell (1991)[31] and statistical analysis from MAVIS. The extent of this vegetation community is shown on Figure 2.

3.3.16 Frequency tables are provided within Table 4.3 Appendix A.

ERICA CILIARIS SURVEY

3.3.17 *Erica ciliaris* was recorded within at the western extent of the heathland survey area (grid reference SW 8382 5364). This species was recorded in the **H4a *Ulex gallii – Agrostis curtisii* heath, *Agrostis curtisii-Erica cinerea* sub-community** (Vegetation Type 2 Habitat). However, it was not recorded in any of the quadrats.

3.3.18 The plant covered an extent of ground approximately 1 m by 1 m. The plant was growing at the edge of heathland habitat, close to a transition between heathland to scrub habitat. Associated plant species included *Ulex gallii*, *Erica cinerea* and rare clumps of *Agrostis curtisii* and *Molinia caerulea*. *Rubus fruticosus* agg. was noted growing within close proximity to the *Erica ciliaris*.

3.3.19 Several stems within the clump of *Erica ciliaris* displayed whorls of four leaves whilst others displayed whorls of three leaves. The plant therefore displayed some characteristics of the hybrid

[28] Rodwell, J.S (1991); British Plant Communities Volume 2: Mires and Heaths; Cambridge University Press.
[29] Rodwell, J.S (1991); British Plant Communities Volume 2: Mires and Heaths; Cambridge University Press.
[30] Rodwell, J.S (1991); British Plant Communities Volume 2: Mires and Heaths; Cambridge University Press.
[31] Rodwell, J.S (1991); British Plant Communities Volume 2: Mires and Heaths; Cambridge University Press.

with *Erica tetralix*. However, this would mean both plants were present to hybridise.

3.3.20 During other surveys conducted on Heathland Site 1 in 2017, *Erica ciliaris* was recorded at grid reference SW 83900 53669[32]. This is in close proximity to the location recorded in the 2016 survey.

3.3.21 The location of the *Erica ciliaris* is shown on Figure 2, with photographs of the plant provided in Table 4.4 (Appendix A).

HEATHLAND SITE 2 - NEWLYN DOWNS SSSI / SAC

3.3.22 Quadrats were taken at the edge of the Newlyn Downs SAC/SSSI. Newlyn Downs represents a large expanse of heath, located a greater than 100 m distant from the proposed Scheme, to the north of the A30. The data collected keyed out using Rodwell (1991)[33] as **H4a *Ulex gallii* – *Agrostis curtisii* heath, *Agrostis curtisii- Erica cinerea* sub-community**. The heath graduated into willow and bramble scrub to the south and east.

3.3.23 Analysis of the quadrat data using MAVIS returned a result of 55.72 % for the H4c *Ulex gallii* – *Agrostis curtisii* heath, *Erica tetralix* sub-community. This was rejected owing to the low levels of *Erica tetralix* recorded within the quadrats. The H4 *Ulex gallii* – *Agrostis curtisii* heath was generated next (54.85 %). However, reference to Rodwell (1991)[34] enabled the habitat to be keyed out to the sub-community level. The H4a sub-community was returned next with a result of 51.23 % which was accepted as most representative of the species within the quadrats.

3.3.24 Constant species comprised *Calluna vulgaris, Ulex gallii, Erica cinerea* and *Molinia caerulea.* Within Quadrat 4 a greater range of species associated with damper conditions were recorded such as *Erica tetralix* and *Narthecium ossifragum*.

3.3.25 In summary, the vegetation community displayed an affinity to the H4a *Ulex gallii – Agrostis curtisii* heath, *Agrostis curtisii- Erica cinerea* sub-community. The extent of this vegetation community is shown on Figure 2.

3.3.26 Frequency tables are provided within Table 4.5 Appendix A.

FIELD SURVEY: WOODLAND NVC

SITE 1

3.3.27 Site 1 was made up of two distinct woodland vegetation communities, encompassing a dry, woodland with a low canopy located on a gently sloping gradient (Stand 1) and a damper area of woodland, flanking a stream, located on flat ground (Stand 2).

STAND 1

3.3.28 Stand 1 comprised an area of low, scrubby woodland located on gently sloping ground. Mature trees were recorded on the extremities of the survey area. However, the woodland predominantly comprised a low canopy cover.

3.3.29 The data collected keyed out using Rodwell (1991)[35] as the **W21 *Crataegus monogyna* – *Hedera helix* scrub community**. The W21 community typically is made up of scrub and hedgerows.

[32] Recorded during Invertebrate Surveys carried out on Heathland Site 1 in August 2017.
[33] Rodwell, J.S (1991); British Plant Communities Volume 1:Woodlands and Scrub; Cambridge University Press.
[34] Rodwell, J.S (1991); British Plant Communities Volume 1:Woodlands and Scrub; Cambridge University Press.
[35] Rodwell, J.S (1991); British Plant Communities Volume 1: Woodlands and Scrub; Cambridge University Press.

However, it is also a transitional community that can be associated with over managed woodlands or where woodlands are subject to human influences.

3.3.30 Analysis of the quadrat data using MAVIS returned a result of 49.19 % for the W8d *Fraxinus excelsior – Acer campestre – Mercurialis perennis* woodland, *Hedera helix* sub-community. This was discounted owing to a lack of tall canopy species such as *Fraxinus excelsior* and *Acer campestre* which are key features of W8d woodlands, along with an absence of calcicolous species within the understorey and field layer. W10c *Quercus robur - Pteridium aquilinum - Rubus fruticosus* woodland, *Hedera helix* sub-community was returned next by MAVIS (48.33 %). Whilst quadrats 1 and 2 displayed some affinities to this community, notably the occurrence of *Quercus robur* and *Lonicera periclymenum*, the result was discounted owing to a lack of *Quercus robur* forming a constant species within the quadrats. The transitional nature of the woodland from scrubby woodland dominated by *Corylus avellana,* with *Prunus spinosa* and *Crataegus monogyna* to high canopy woodland with *Acer pseudoplatanus* and *Quercus robur* would account for the affinities to W10c returned from MAVIS.

3.3.31 The W21c *Crataegus monogyna – Hedera helix, Brachypodium sylvaticum* sub-community (47.89 %) featured next within the results returned by MAVIS. This was discounted owing to the lack of *Brachypodium sylvaticum* within the field layer. This was followed by a result of 46.72 % returned by MAVIS for the W21 scrub community. Although this coefficient was lower than the previous results, it was selected as being most representative of the habitat. It was not possible to key out to sub-community level of W21 as the quadrats did not display species associated with the sub-communities (*Urtica dioica, Mercurialis perennis*, or *Viburnum lantana*).

3.3.32 Floristically, the woody components of the W21 scrub community Rodwell (1991)[36] are varied which could explain the species variation within Stand 1. Rodwell (1991)[37] confirms that *Corylus avellana* is usually uncommon. However, it can feature prominently on stands developed from de-generating woodland or mis-managed coppice. A lack of management in Stand 1 within the woodland coppice could explain the presence of this species.

3.3.33 *Hedera helix* and *Lonicera periclymenum* formed constant species throughout. The presence of these woody climbers is typical for the W21 scrub community. The field layer was species-poor, which is characteristic of the vegetation community. *Dryopteris dilatata* formed a constant species, with frequent *Blechnum spicant* and occasional examples of *Circaea lutetiana* and *Dryopteris affinis* agg. Large swathes of *Hyacinthoides non-scripta* featured more prominently to the west (quadrats 3 and 4). *H. non-scripta* is typical for W21, preferential to moister soils. Bryophytes including *Atrichum undulatum, Isothecium myosuroides* and *Kindbergia praelonga* were recorded.

3.3.34 In summary, Stand 1 displayed some affinity to the W21 *Crataegus monogyna – Hedera helix* scrub community. It is considered that there are several transitional habitats present within the woodland. Transitional habitats are notoriously difficult to delineate and survey. The extent of this vegetation community is shown on Figure 2.

3.3.35 Frequency tables are provided within Table 4.6 Appendix B.

STAND 2

3.3.36 Stand 2 comprised damp woodland with scattered mature examples of *Quercus robur.* The woodland was located at the bottom of a slope. *Corylus avellana, Rubus fruticosus* agg. and *Crataegus monogyna* featured heavily and formed a low canopy in many locations, with a variable

[36] Rodwell, J.S (1991); British Plant Communities Volume 1: Woodlands and Scrub; Cambridge University Press.
[37] Rodwell, J.S (1991); British Plant Communities Volume 1: Woodlands and Scrub; Cambridge University Press.

field layer.

3.3.37 The data collected keyed out using Rodwell (1991)[38] as the **W10c *Quercus robur - Pteridium aquilinum - Rubus fruticosus* woodland, *Hedera helix* sub-community**. W10c is a variable community whose floristic differences related to climate and soil are typically overlain by treatment-derived variation in the canopy and understorey. *Quercus robur* is a characteristic species with *Betula pendula* often prominent, reducing in unmanaged canopies with lower levels of light. The absence of management in the woodland may explain the absence of *Betula pendula*. In terms of the field layer, some of the constants typical of the community were absent, namely *Hyacinthoides non-scripta*.

3.3.38 Analysis of the quadrat data using MAVIS returned a result of 42.58 % for the W6 *Alnus glutinosa - Urtica dioica* woodland. This was rejected owing to a lack *Alnus glutinosa* and other associated canopy species, such as *Betula pubescens*. The W10c *Quercus robur - Pteridium aquilinum - Rubus fruticosus* woodland, *Hedera helix* sub-community was returned next by MAVIS (39.53 %). *Hedera helix* is conspicuous in this sub-community, particularly in neglected coppices such as those recorded within Stand 2. Elements of this sub-community were present within several sections of the woodland. The W6c *Alnus glutinosa - Urtica dioica* woodland, *Sambucus nigra* sub-community featured next within the results (38.01 %). This was rejected owing to a lack of *Alnus glutinosa* and *Sambucus nigra*. W10 featured next within MAVIS (37.97 %) supporting the allocation of the habitat to a W10c sub-community.

3.3.39 A relatively low coefficient was returned (39.53%) for the W10c sub-community. However, this may be due to moister soils in this area and a lack of established woodland. Overall the key was relied on in this instance because of the presence of characteristic species, such as *Quercus robur,* and the presence of common understorey shrubs typical of W10c, such as constant *Corylus avellana,* frequent *Ilex aquifolium* and *Crataegus monogyna,* with a patchy *Sambucus nigra* cover. *Lonicera periclymenum* and *Rubus fruticosus* agg. are typical scrub species which were present within the woodland as constant species. Many W10 woodlands stands have a grassy appearance which correlated with the occurrence of *Holcus mollis* in quadrats 2 and 3. The stand varied considerably and a range of species were noted in the field layer. Constant species within the field layer included *Dryopteris dilatata, Galium palustre, Hedera helix* and *Lonicera periclymenum* with frequent *Osmunda regalis, Geranium robertianum* and *Solanum dulcamara. Salix caprea* featured as a constant which is not typical for W10 and its sub-communities. This is likely to account for the low coefficients returned by MAVIS, along with the absence of species such as *Pteridium aquilinum*.

3.3.40 In summary, Stand 2 displayed an affinity to the W10c *Quercus robur - Pteridium aquilinum - Rubus fruticosus, Hedera helix* sub-community (which was returned by MAVIS). The range of results generated by MAVIS suggests patchy mosaics are present within the woodland. As with Stand 1, it is considered that there are several transitional habitats present. The extent of this vegetation community is shown on Figure 2.

3.3.41 Frequency tables are provided within Table 4.7 Appendix B.

SITE 3

3.3.42 Site 3 comprised wet woodland with a thick *Salix cinerea* canopy, bisected by a stream. Large areas of bare ground and patches of herbaceous species and scrub were noted.

3.3.43 The data collected keyed out using Rodwell (1991)[39] as the **W1 *Salix cinerea-Galium palustre* community**. W1 is essentially a community on wet mineral soils on the margins of water and in

[38] Rodwell, J.S (1991); British Plant Communities Volume 1:Woodlands and Scrub; Cambridge University Press.
[39] Rodwell, J.S (1991); British Plant Communities Volume 1:Woodlands and Scrub; Cambridge University Press.

moist hollows where *Salix cinerea* invades the moist ground in a wide variety of situations. The survey area comprised a species-poor version of the W1 community.

3.3.44 Canopy species within the stand comprised *Quercus robur* and *Salix cinerea*. Understorey shrub constant species included *Crataegus monogyna* and *Sambucus nigra*. *Rubus fruticosus* agg. and *Hedera helix* also featured heavily. Constant species within the field layer comprised *Dryopteris dilatata* and *Geranium robertianum* with occasional *Hyacinthoides non-scripta.* Bryophytes such as *Thuidium tamariscinum* and *Isothecium myosuroides* were recorded.

3.3.45 Analysis of the quadrat data using MAVIS returned a range of communities all at low correlation coefficients. Therefore the MAVIS analysis was treated with caution in this instance. The highest affinity was afforded to the W8d *Fraxinus excelsior - Acer campestre - Mercurialis perennis* woodland, *Hedera helix* sub-community (42.30 %) which was discounted owing to a lack of tall canopy species, including the absence of *Fraxinus excelsior* which is canopy dominant for this sub-community, in addition to lower levels of *Quercus robur*. The W6d *Alnus glutinosa - Urtica dioica* woodland, *Sambucus nigra* sub-community (40.08 %) was returned which was discounted owing to the lack of *Alnus glutinosa.* However, some affinities with species within the W6d understorey were recorded, such as the presence of *Sambucus nigra* and *Crataegus monogyna.* This may be due to the presence of wet soils and a limited W1 ground flora recorded in Site 3.

3.3.46 In summary, the woodland at Site 3 displayed an affinity to the W1 *Salix cinerea-Galium palustre* community. W1 was not returned by MAVIS which is likely to have resulted from the variability of the stand, the lack of canopy cover and the presence of large areas of bare ground with scrub and herbs dominating. The community keyed out in Rodwell (1991)[40] was selected as most representative of the woodland. The extent of this vegetation community is shown on Figure 2.

3.3.47 Frequency tables are provided within Table 4.8 Appendix B.

SITE 6A – STAND 1

3.3.48 Site 6A represented a large block of woodland and was split into four stands, two of which were subject to NVC (Stand 1 and 4). Stand 1 comprised woodland with a tall canopy dominated by *Fagus sylvatica, Fraxinus excelsior* and *Acer pseudoplatanus.* A variety of species were present in the understorey including ornamental and non-native species.

3.3.49 The data collected keyed out using Rodwell (1991)[41] as the **W14 *Fagus sylvatica - Rubus fruticosus* woodland**. W14 is typically species-poor woodland owing to the shading properties of *Fagus sylvatica* which limits levels of ground flora. This is likely to account for the relatively scarce number of herbs recorded. *Fagus sylvatica, Fraxinus excelsior* and *Acer pseudoplatanus* formed the constant canopy species within the quadrats, with *Castanea sativa* and *Taxus baccata* recorded frequently and *Carpinus betulus* recorded occasionally. *Ilex aquifolium, Lonicera periclymenum* and *Rubus fruticosus* agg. were well represented in the understorey. These species are all associates of W14 woodlands.

3.3.50 Analysis of the quadrat data using MAVIS returned the W10c *Quercus robur - Pteridium aquilinum - Rubus fruticosus* woodland community, *Hedera helix* sub-community (40.25 %), followed by the W10a typical sub-community (37.69 %) and the W10 *Quercus robur - Pteridium aquilinum - Rubus fruticosus* woodland community (36.11 %). Whilst elements of W10 woodlands were recorded (such as the presence of *Quercus robur, Hedera helix* and *Corylus avellana*), the W10 community and sub-communities were rejected owing to a lack of *Quercus robur* as a constant and an absence of *Pteridium aquilinum.* However, elements of W10 did feature within the woodland. The W14

[40] Rodwell, J.S (1991); British Plant Communities Volume 1:Woodlands and Scrub; Cambridge University Press.
[41] Rodwell, J.S (1991); British Plant Communities Volume 1:Woodlands and Scrub; Cambridge University Press.

Fagus sylvatica - Rubus fruticosus woodland was then returned by MAVIS (32.39 %) which was selected as most representative of the woodland, despite the lower coefficient returned by MAVIS.

3.3.51 In summary, Stand 1 had the closest associations with the W14 *Fagus sylvatica - Rubus fruticosus* woodland community owing to the dominance of *Fagus sylvatica* in the canopy and the association of *Quercus robur. Fraxinus excelsior* and *Acer pseudoplatanus* were also present in the canopy. *Acer pseudoplatanus* is not usually common within W14 woodlands, which may explain the low coefficient provided by MAVIS. The woodland was subject to the NVC survey during August which may have affected the coefficients returned by MAVIS. The extent of this vegetation community is shown on Figure 2.

3.3.52 Frequency tables are provided within Table 4.9 Appendix B.

SITE 6A – STAND 4

3.3.53 Stand 4 displayed many floristic similarities to Stand 1. The woodland keyed out using Rodwell (1991)[42] as the **W14 *Fagus sylvatica - Rubus fruticosus* woodland**.

3.3.54 Analysis of the quadrat data using MAVIS returned the W10 *Quercus robur - Pteridium aquilinum - Rubus fruticosus* woodland sub-communities; namely the W10c *Hedera helix* sub-community (39.51 %) and the W10a typical sub-community (36.78 %). The W14 *Fagus sylvatica - Rubus fruticosus* woodland was returned next within MAVIS (33.51 %). As with Stand 1, the low coefficients returned by MAVIS for Stand 4 could be explained by elements of W10 communities being present within the woodland, in addition to the presence of ornamental and non-native species, which will affect plant assemblages.

3.3.55 In summary, the Site 6A (Stand 4) displayed an affinity to the W14 *Fagus sylvatica - Rubus fruticosus* woodland, with some elements of W10 woodland communities. The extent of this vegetation community is shown on Figure 2.

3.3.56 Frequency tables are provided within Table 4.10 Appendix B.

SITE 7 – STAND 1

3.3.57 Stand 1 comprised established canopy woodland dominated by *Acer pseudoplatanus* and *Fraxinus excelsior,* with a high number of species recorded within the field layer.

3.3.58 The data collected keyed out using Rodwell (1991)[43] as the **W10c *Quercus robur – Pteridium aquilinum – Rubus fruticosus* woodland, *Hedera helix* sub-community**. MAVIS returned a result of 42.55% for this sub-community. The presence of species such as *Hedera helix*, *Quercus robur*, *Rubus fruticosus* agg., *Corylus avellana* and *Sambucus nigra* supports attributing the woodland this sub-community.

3.3.59 Constant species included *Fraxinus excelsior* and *Quercus robur*, with *Rubus fruticosus* agg, *Corylus avellana, Sambucus nigra* and *Ilex aquifolium* forming understorey constants. *Hyacinthoides non-scripta* and *Ficaria verna* were frequently represented in the ground layer. Bryophytes such as *Kindbergia praelonga* were also present.

3.3.60 Analysis of the quadrat data using MAVIS returned several W8 *Fraxinus excelsior - Acer campestre - Mercurialis perennis* woodland sub-communities, namely the W8d *Hedera helix* sub-community (44.86%), the W8f *Allium ursinum* sub-community (43.74%) and the W8e *Geranium robertianum*

[42] Rodwell, J.S (1991); British Plant Communities Volume 1:Woodlands and Scrub; Cambridge University Press.
[43] Rodwell, J.S (1991); British Plant Communities Volume 1:Woodlands and Scrub; Cambridge University Press.

sub-community (42.87%). These sub-communities were rejected owing to a lack of constant species associated with W8 sub-community woodlands, such as *Acer campestre, Cornus sanguinea* and *Mercurialis perennis*. A scarcity of plants such as *Mercurialis perennis* allows separation of W8 from W10 woodlands which was evident during the keying out using Rodwell (1991)[44]. The presence of *Hyacinthoides non-scripta, Circaea lutetiana* and *Geum urbanum*, alongside an absence of acid indicators, may have contributed to the affinities with W8 sub-communities in MAVIS.

3.3.61 In summary, the woodland at Site 7 – Stand 1 displayed an affinity to W10c *Quercus robur – Pteridium aquilinum – Rubus fruticosus* woodland*, Hedera helix* sub-community. A lack of *Pteridium aquilinum* and *Lonicera periclymenum,* species typical in W10 woodlands, may explain the weak fit recorded within MAVIS. The extent of this vegetation community is shown on Figure 2.

3.3.62 Frequency tables are provided within Table 4.11 Appendix B.

SITE 8

3.3.63 Site 8 represented a small and isolated unit of woodland with a tall canopy, dominated by mature trees. The habitat recorded at Site 8 represented grassland with trees, and was highly modified by human management.

3.3.64 The habitat weakly keyed out using Rodwell (1991)[45] as the **W14 *Fagus sylvatica - Rubus fruticosus* woodland**. Tree species recorded included *Fagus sylvatica, Acer pseudoplatanus* and *Fraxinus excelsior*. No understorey was recorded and the ground layer was dominated by species associated with mesotrophic grasslands. Occasional examples of *Hyacinthoides non-scripta* were recorded within four of the quadrats which may have their origins in remnant semi-natural woodland.

3.3.65 The communities returned by MAVIS were grassland and open vegetation communities. First returned was the MG11a *Festuca rubra - Agrostis stolonifera - Potentilla anserina* grassland, *Lolium perenne* sub-community (37.74 %). This was followed by MG11 *Festuca rubra - Agrostis stolonifera - Potentilla anserina* grassland (34.45 %) and the OV23 *Epilobium angustifolium* community (31.54 %). Whilst elements of these communities were present, the MAVIS results were rejected in favour of Rodwell (1991)[46], owing to the mature tree cover present which was considered more representative of the habitat unit. Evidence of cattle grazing was recorded within the woodland. High levels of grazing, combined with other treatments, may have affected the plant assemblages, resulting in the habitat not displaying a clear affinity to a vegetation community.

3.3.66 In summary, the woodland at Site 8 weakly keyed out to a W14 *Fagus sylvatica - Rubus fruticosus* woodland. Human influences and high levels of grazing are likely to have resulted in the woodland no longer displaying clear affinities to a woodland community. The woodland is unlikely to meet the Wood Pasture and Parkland HPI as it lacked the characteristics associated within these woodlands, such as ancient or veteran trees, assemblages of lichen or bryophytes, or areas of scrub[47]. The extent of this vegetation community is shown on Figure 2.

3.3.67 Frequency tables are provided within Table 4.12 Appendix B.

SITE 11

[44] Rodwell, J.S (1991); British Plant Communities Volume 1:Woodlands and Scrub; Cambridge University Press.
[45] Rodwell, J.S (1991); British Plant Communities Volume 1:Woodlands and Scrub; Cambridge University Press.
[46] Rodwell, J.S (1991); British Plant Communities Volume 1:Woodlands and Scrub; Cambridge University Press.
[47] http://jncc.defra.gov.uk/pdf/UKBAP_BAPHabitats-65-WoodPastureParkland2011.pdf

3.3.68 Site 11 comprised a mosaic of woodland habitats, including components of semi-natural and plantation woodland. Some of these habitats were highly modified with a large proportion of the woodland made up of coniferous plantation that was not subject to an NVC assessment. The outer extent of the woodland was characterised by semi-natural broadleaved woodland. Old earth embankments were recorded which displayed species characteristic of older woodlands such as *Hyacinthoides non-scripta*, *Blechnum spicant, Carex remota, Circaea lutetiana, Rumex sanguineus* and *Allium ursinum.*

3.3.69 The data collected keyed out using Rodwell (1991)[48] as the **W14 *Fagus sylvatica - Rubus fruticosus* woodland**. The woodland comprised a uniform age and height with *Fagus sylvatica* forming the constant canopy species within the area subject to NVC. *Fagus sylvatica* is a constant species within W14 woodlands, supporting the allocation of the woodland to this community. A sparse field layer and understorey was recorded. *Ilex aquifolium* formed the main understorey species where it presented itself as a layer of smaller trees (rather than a dense understorey), which is characteristic of the W14 community. The shading effect of *Fagus sylvatica* limits the ground-flora, which was evident with the low-levels of ground-floral species present. Scattered stands of *Dryopteris dilatata* were noted, which is characteristic of the W14 woodland community. *Hedera helix* featured occasionally within the field layer, along with scarce *Lonicera periclymenum.* Whilst this species was scarce, it is a characteristic species of W14 woodlands supporting the result keyed out in Rodwell (1991)[49]. *Rubus fruticosus* agg. generally forms a constant species within W14 woodlands. However, it was scarce within the quadrats which may have contributed to the low coefficient returned in MAVIS.

3.3.70 Several poor coefficients were returned by MAVIS. First returned was the W14 *Fagus sylvatica - Rubus fruticosus* woodland (28.61%). This was followed by the W15 *Fagus sylvatica - Deschampsia flexuosa* woodland (22.66 %) which was rejected owing to a lack of the constant *Deschampsia flexuosa* in the field layer. MAVIS also returned the W16 *Quercus* spp. - *Betula* spp. - *Deschampsia flexuosa* woodland (22.19 %) which is a highly acidic community which was rejected owing to a lack of associated community species such as *Calluna vulgaris, Deschampsia flexuosa* and *Pteridium aquilinum.*

3.3.71 In summary, the woodland at Site 8 keyed out as a W14 *Fagus sylvatica - Rubus fruticosus* woodland. This is considered to form the predominant vegetation community within the broadleaved section of the woodland. The highly modified nature of the woodland is likely to have weakened the fit to a community. Areas of interest were noted along old boundaries and the southern extent of the eastern section. Whilst not subject to an NVC, the boundaries displayed field layer species associated with more base-rich conditions such as *Circaea lutetiana* and *Allium ursinum.* Calcicolous often are uncommon within W14 woodlands and it is considered that there are several transitional habitats present within the woodland.

3.3.72 Frequency tables are provided within Table 4.13 Appendix B.

Table 3.2 Summary Table

Site reference	Vegetation community
Heathland	
Site 1	H4 *Ulex gallii – Agrostis curtisii* heath (Vegetation Type 1 Habitat) H4a *Ulex gallii – Agrostis curtisii* heath, *Agrostis curtisii-Erica cinerea* (Vegetation Type 2 Habitat) H4c *Ulex gallii – Agrostis curtisii* heath, *Erica tetralix* sub-community

[48] Rodwell, J.S (1991); British Plant Communities Volume 1:Woodlands and Scrub; Cambridge University Press.
[49] Rodwell, J.S (1991); British Plant Communities Volume 1:Woodlands and Scrub; Cambridge University Press.

	(Vegetation Type 3 Habitat) *Erica ciliaris* recorded to the west of Site 1
Site 2	H4a *Ulex gallii – Agrostis curtisii* heath, *Agrostis curtisii- Erica cinerea* sub-community
Woodland	
Site 1	W21 *Crataegus monogyna – Hedera helix* scrub community (Stand 1) W10c *Quercus robur - Pteridium aquilinum - Rubus fruticosus* woodland, *Hedera helix* sub-community
Site 3	W1 *Salix cinerea-Galium palustre* community
Site 6A	W14 *Fagus sylvatica - Rubus fruticosus* woodland
Site 7	W10c *Quercus robur – Pteridium aquilinum – Rubus fruticosus* woodland*, Hedera helix* sub-community
Site 8	W14 *Fagus sylvatica - Rubus fruticosus* woodland
Site 11	W14 *Fagus sylvatica - Rubus fruticosus* woodland

4 CONCLUSION

HEATHLAND

4.1.1 During the NVC survey carried out in August 2016, the heathland habitats within the survey area displayed an affinity to the following vegetation communities:

- Site 1 H4 *Ulex gallii – Agrostis curtisii* heath; H4a *Ulex gallii – Agrostis curtisii* heath, *Agrostis curtisii – Erica cinerea* sub-community, and H4c *Ulex gallii – Agrostis curtisii* heath, *Erica tetralix* sub-community.
- Site 2 H4a *Ulex gallii – Agrostis curtisii* heath, *Agrostis curtisii – Erica cinerea* sub-community.

4.1.2 The plant *Erica cilliaris* is known to be present within the Newlyn Downs SAC (Site 2 forms part of the SAC). This species was also recorded within the western section of Site 1. This plant is not listed as an SPI and is not afforded legal protection *per se*. However, it is a nationally rare RDB species and is listed as an Annex II species on the Habitats Directive.

4.1.3 Several stems within the clump of *Erica ciliaris* displayed whorls of four leaves whilst others displayed whorls of three leaves. The plant therefore displayed some characteristics of the hybrid with *Erica tetralix*. However, this would mean that both plants were present to hybridise.

WOODLAND

4.1.4 A series of fragmented semi-natural and plantation woodlands are located within 100 m of the proposed Scheme during NVC surveys undertaken in 2017. Affinities to communities and sub-communities of the NVC are provided:

- Site 1 - W21 *Crataegus monogyna – Hedera helix* scrub community; and W10c *Quercus robur - Pteridium aquilinum - Rubus fruticosus* woodland, *Hedera helix* sub-community;
- Site 3 - W1 *Salix cinerea-Galium palustre* community;
- Site 6A - W14 *Fagus sylvatica - Rubus fruticosus* woodland;
- Site 7 - W10c *Quercus robur – Pteridium aquilinum – Rubus fruticosus* woodland, *Hedera helix* sub-community;
- Site 8 - W14 *Fagus sylvatica - Rubus fruticosus* woodland; and
- Site 11 - W14 *Fagus sylvatica - Rubus fruticosus* woodland.

Appendix A

HEATHLAND NVC RESULTS

Table 4.1 Vegetation Type 1

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Erica cinerea	9	8	9	7	8	V	7 to 9
Calluna vulgaris	5	5		4	5	IV	4 to 5
Ulex gallii	7	9	7		7	IV	7 to 9
Molinia caerulea	5				4	II	4 to 5
Agrostis curtisii	4					I	4
Potentilla erecta					3	I	3
Description	Relatively tall stand of dwarf shrub heath, including some leggy examples of *Calluna vulgaris*. Graminoids and herbs were limited within the sward. The sward height was approximately 40 - 50 cm.						
Management	No signs of management						

Table 4.2 Vegetation Type 2

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Agrostis curtisii	7	4	8	9	6	V	4 to 7
Calluna vulgaris	3	4	4	3	5	V	3 to 5
Erica cinerea	7	7	7	6	7	V	6 to 7
Teucrium scorodonia	3	3	3	4	4	V	3 to 4
Ulex gallii	5	7	7	6	6	V	5 to 7
Molinia caerulea		7	5	4	7	IV	4 to 7
Potentilla erecta	4		4	3	4	IV	3 to 4
Rubus fruticosus agg.	4	3	5	5		IV	3 to 5
Racomitrium lanuginosum	3	5		4	7	IV	4 to 7
Carex demissa			3			I	3
Holcus lanatus	3					I	3
Viola canina				3		I	3
Polytrichum juniperinum	3					I	3
Description	Dry, graminoid dominated vegetation stand located along the western extent of the survey area. Ericaceous shrubs were constant within the stand. The sward height was approximately 30 – 40 cm. No signs of management. N.B. Dorset heath was recorded within this habitat type (see Figure 1 for location).						
Management	No signs of management						

Table 4.3 Vegetation Type 3

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Calluna vulgaris	5	7	7	6	5	V	5 to 7
Erica cinerea	8	8	7	7	7	V	7 to 8
Molinia caerulea	5	3	5	6	7	V	3 to 7
Ulex gallii	8	7	6	7	5	V	6 to 8
Pseudoscleropodium cf. *purum*		5	6	6	7	IV	5 to 7
Erica tetralix			6	4		II	4 to 6
Description	Tall stand of dwarf shrub heath, approximately 50 cm in height. Stand dominated by gorse and leggy stands of heather. Tussocks of grasses (*Molinia caerulea*) featured regularly within the sample area. No signs of management.						
Management	No signs of management						

Table 4.4 Hybrid *Erica ciliaris* (Dorset heath) recorded within Site 1

Table 4.5 Newlyn Downs SSSI/SAC

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	RANGE
Calluna vulgaris	5	5	5	3	4 to 5
Molinia caerulea	4	1	8	8	1 to 8
Erica cinerea	7	7	5		5 to 7
Ulex gallii	6	7	5		5 to 7
Agrostis curtisii	1		2		1 to 2
Carex demissa			2	5	2 to 5
Erica ciliaris	7		7		7
Potentilla erecta			5	4	4 to 5
Athyrium filix-femina				1	1
Blechnum spicant				4	4
Cirsium palustre				1	1
Erica tetralix				4	4
Juncus bulbosus				5	5
Juncus conglomeratus				4	4
Narthecium ossifragum				5	5
Osmunda regalis				4	4
Salix aurita				5	5
Schoenus nigricans				5	5
Sphagnum cf. *compactum*				4	4

Description	Relatively diverse sward dominated by gorse and heather species and some grasses. Sward height around 40 cm. Graduates into scrub to the south and east.
Management	Low intensity cattle grazing (native breeds noted)

Appendix B

WOODLAND NVC RESULTS

Table 4.6 Site 1 – Stand 1

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Corylus avellana	9	9	9	9	5	V	5 to 9
Dryopteris dilatata	5	7	5		5	IV	5 to 7
Hedera helix	7	5	5		6	IV	5 to 7
Lonicera periclymenum	3	4	3	7		IV	3 to 7
Rubus fruticosus agg.		5	5	5	7	IV	5 to 7
Atrichum undulatum	5	3			5	III	3 to 5
Blechnum spicant	3			4	4	III	3 to 4
Crataegus monogyna	5	5			5	III	5
Hyacinthoides non-scripta	5		10	10		III	5 to 10
Kindbergia praelonga			4	4	7	III	4 to 7
Prunus spinosa			4	4	5	III	4 to 5
Circaea lutetiana		5			3	II	3 to 5
Dryopteris affinis agg.		7			5	II	5 to 7
Galium aparine	3	3				II	3
Heracleum sphondylium	7	4				II	4 to 7
Mnium hornum					4	II	4
Polypodium vulgare agg.			4		4	II	4
Quercus robur	4	4				II	4
Salix caprea	3				7	II	3 to 7
Acer pseudoplatanus	3					I	3
Anemone nemorosa			4			I	4
Angelica sylvestris	3					I	3
Asplenium scolopendrium	3					I	3
Dryopteris filix-mas	4					I	4
Geranium robertianum	4					I	4
Geum urbanum		3				I	3
Holcus lanatus					3	I	3
Ilex aquifolium	4					I	4
Isothecium myosuroides					7	I	7
Poa nemoralis	3					I	3
Prunus sp.	3					I	3
Silene dioica					3	I	3
Tamus communis	4					I	4
Bare ground %	30	40	40	15	30		
Description	Woodland is located on a gently sloping gradient. Understorey varies between dense and sparse. It is split into areas of wet and dry woodland (wet forms a separate vegetation community). Mosses were noted on trunks.						

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Management	None apparent – possible deer grazing						

Table 4.7 Site 1 – Stand 2

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Salix caprea	9	8	8	9	9	V	8 to 9
Corylus avellana	5	8	8	5		IV	5 to 8
Galium palustre	3		5	4	4	IV	3 to 5
Lonicera periclymenum	7	7		4	6	IV	4 to 7
Rubus fruticosus agg.	7	8		7	6	IV	6 to 8
Thuidium tamariscinum	7		6	5	4	IV	4 to 7
Athyrium filix-femina			3	4	4	III	3 to 4
Blechnum spicant	4		4	5		III	4 to 5
Crataegus monogyna		4	4	4		III	4
Galium aparine		4	3		3	III	3 to 4
Geranium robertianum		7	3		4	III	3 to 7
Hedera helix	7		4		6	III	4 to 7
Ilex aquifolium	4	4	4			III	4
Osmunda regalis	7			3	3	III	3 to 7
Quercus robur	4	5	5			III	4 to 5
Solanum dulcamara		4	5		3	III	3 to 5
Cardamine flexuosa			3		4	II	3 to 4
Chrysosplenium oppositifolium		10	5			II	5 to 10
Dryopteris dilatata	6			6	5	II	5 to 6
Holcus mollis		7	4			II	4 to 7
Isothecium myosuroides	7				5	II	5 to 7
Mentha aquatica			5		5	II	5
Polypodium vulgare agg.	4	6				II	4 to 6
Ranunculus ficaria		4			3	II	3 to 4
Sambucus nigra		4	4			II	4
Veronica montana		3			3	II	3
Angelica sylvestris					5	I	5
Atrichum undulatum			5			I	5
Carex pendula					4	I	4
Carex remota				4		I	4
Circaea lutetiana				3		I	3
Cirsium palustre					3	I	3

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Filipendula ulmaria			7			I	7
Glechoma hederacea					4	I	4
Juncus articulatus	4					I	4
Juncus effusus					4	I	4
Luzula sylvatica					3	I	3
Polytrichum formosum	3					I	3
Ranunculus repens		4				I	4
Rosa canina	4					I	4
Rumex sanguineus					3	I	3
Sphagnum sp.				5		I	5
Urtica dioica		4				I	4
Bare ground %	40	10	30	20	20		
Description	Wet woodland with a high cover of mosses in the understorey. No signs of management however deer grazing possible. Canopy averaging 8m in height with the understorey around 1m.						
Management	None apparent – possible deer grazing						

Table 4.8 Site 3

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Corylus avellana	5	5	5	5	5	V	5
Crataegus monogyna	4	4	4	4	4	V	4
Geranium robertianum	3	5	4	4	4	V	3 to 5
Hedera helix	5	6	6	6	7	V	5 to 7
Quercus robur	4	4	4	4	4	V	4
Salix cinerea	9	9	9	9	9	V	9
Sambucus nigra	4	4	4	4	4	V	4
Dryopteris dilatata	4	5		5	5	IV	4 to 5
Rubus fruticosus agg.	7	5	4		7	IV	4 to 7
Geum urbanum	4		4		5	III	4 to 5
Thuidium tamariscinum		4		5	5	III	4 to 5
Galium aparine		5		3		II	3 to 5
Hyacinthoides non-scripta		6	7			II	6 to 7
Rumex sanguineus	3				5	II	3 to 5
Athyrium filix-femina	**4**					**I**	4
Circaea lutetiana	3					I	3
Isothecium myosuroides		5				I	5
Juncus effusus	2					I	2
Lonicera periclymenum		4				I	4

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Osmunda regalis		4				I	4
Polytrichum formosum				4		I	4
Ranunculus repens					5	I	5
Viola riviniana					5	I	5
Description	Wet woodland with thick willow canopy 10m high. Stream through centre, large areas of bare ground and patches of herbaceous species and scrub.						
Management	No evidence						

Table 4.9 Site 6A – Stand 1

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Acer pseudoplatanus	4	5	4	4	4	V	4 to 5
Fagus sylvatica	7	8	7	8	7	V	7 to 8
Fraxinus excelsior	4	7	8	6	8	V	4 to 8
Rubus fruticosus agg.	7	4	5	4	3	V	3 to 7
Hedera helix		9	8	8	7	IV	7 to 9
Ilex aquifolium	5		4	4	4	IV	4 to 5
Bryophytes sp.		10	6	8	9	IV	6 to 10
Castanea sativa	4			4	4	III	4
Corylus avellana	6	5	5			III	5 to 6
Fraxinus excelsior	7	4			3	III	3 to 7
Lonicera periclymenum			7	4	4	III	4 to 7
Quercus robur	4	4	4			III	4
Rubus fruticosus agg.	8	4	4			III	4 to 8
Taxus baccata		6	5		4	III	4 to 6
Carpinus betulus				4	5	II	4 to 5
Carpinus betulus		4			4	II	4
Crataegus monogyna			4	4		II	4
Dryopteris affinis agg.		4		4		II	4
Pinus sp.	7		4			II	4 to 7
Prunus laurocerasus	8			6		II	6 to 8
Rhododendron ponticum	4		4			II	4
Taxus baccata				4	4	II	4
Agrostis stolonifera	5					I	5
Betula pendula	4					I	4
Blechnum spicant	4					I	4
Carex pendula	1					I	1
Carex sp.	4					I	4

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Corylus avellana	6					I	6
Digitalis purpurea	4					I	4
Hedera helix			4			I	4
Holcus lanatus	5					I	5
Hypericum pulchrum	4					I	4
Ilex aquifolium		4				I	4
Juncus inflexus	4					I	4
Leycesteria formosa	7					I	7
Leycesteria formosa	4					I	4
Picea sp.	5					I	5
Poa trivialis	5					I	5
Primula vulgaris		4				I	4
Quercus robur	1					I	1
Senecio jacobaea	1					I	1
Bare ground %	50	30					
Description	Beech and ash woodland with a range of species within the understorey and ground layer. Ornamental / non-native species present.						
Management	No evidence						

Table 4.10 Site 6A – Stand 4

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Fagus sylvatica	8	6	7	8	7	V	6 to 8
Hedera helix	4	5	4	4	8	V	4 to 8
Bryophytes sp.	4	7	5	4	7	V	4 to 7
Prunus laurocerasus	6	7	7	6		IV	6 to 7
Acer pseudoplatanus	5		5		6	III	5 to 6
Asplenium scolopendrium			4		1	III	1 to 4
Blechnum spicant	4	5			1	III	1 to 5
Corylus avellana		7		7	4	III	4 to 7
Dryopteris affinis agg.	4		5		5	III	4 to 5
Dryopteris filix-mas	1		4	4		III	1 to 4
Fraxinus excelsior		7	8		8	III	7 to 8
Ilex aquifolium	1			4	4	III	1 to 4
Taxus baccata	4		4		4	III	4
Carex pendula	1	5				II	1 to 5
Castanea sativa		5		4		II	4 to 5
Circaea lutetiana		4			5	II	4 to 5

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Fraxinus excelsior	4	4				II	4
Pinus sp.			4	5		II	4 to 5
Quercus robur	5				4	II	4 to 5
Rubus fruticosus agg.	4	4			8	II	4 to 8
Rubus fruticosus agg.	5	4		4		II	4 to 5
Taxus baccata	1				4	II	1 to 4
Acer pseudoplatanus					4	I	4
Carex remota		4				I	4
Corylus avellana					4	I	4
Crataegus monogyna					4	I	4
Crataegus monogyna					5	I	4
Fagus sylvatica	3					I	3
Ilex aquifolium				4		I	4
Juncus effusus		5				I	5
Juncus inflexus		4				I	4
Lonicera periclymenum					4	I	4
Polytrichum [spp]		4				I	4
Rhododendron ponticum	4					I	4
Rhododendron ponticum	4			4		I	4
Salix caprea		5				I	5
Veronica hederifolia		5				I	5
Liverwort sp.		4				I	4
Bare ground %	80	5	70	85	20		
Description	Mixed and often damp woodland dominated by beech, ash and ferns.						
Management	No evidence						

Table 4.11 Site 7 – Stand 1

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Acer pseudoplatanus	9	9	9	9	9	V	9
Corylus avellana	4	4	4	4	4	V	4
Fraxinus excelsior	5	5	4	4	4	V	4 to 5
Hedera helix	9	9	9	9	9	V	9
Ilex aquifolium	4	4	5	5	5	V	4 to 5
Quercus robur	4	4	4	4	3	V	3 to 4
Sambucus nigra	4	4	4	4	4	V	4
Circaea lutetiana	5	4	4	5		IV	4 to 5

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Galium aparine	5	4	5	5		IV	4 to 5
Ranunculus ficaria	4	3		5	6	IV	3 to 6
Rubus fruticosus agg.		4	4	4	4	IV	4
Hyacinthoides non-scripta			9	9	8	III	8 to 9
Asplenium scolopendrium				4	4	II	4
Athyrium filix-femina	5	4				II	4 to 5
Dryopteris dilatata	4	4				II	4
Geranium robertianum	5	5				II	5
Rumex sanguineus				4	4	II	4
Salix caprea	4	4				II	4
Crataegus monogyna	4					I	4
Dryopteris affinis agg.		4				I	4
Geum urbanum				4		I	4
Isothecium myosuroides	5					I	5
Kindbergia praelonga	5					I	5
Urtica dioica			4			I	4
Bare ground %	20	20	10	10	10		
Description	Woodland canopy dominated by sycamore, with a patchy understorey. A range of species recorded within the ground layer including some ancient woodland species.						
Management	No evidence. Garden waste recorded at edge of woodland.						

Table 4.12 Site 8

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Poa pratensis	8	9	7	5	6	V	5 to 9
Agrostis stolonifera	6	5	7	5	5	V	5 to 7
Fagus sylvatica	7	7	7	7	7	V	7
Quercus robur	7	7	7	7	7	V	7
Acer pseudoplatanus	5	5	5	5	5	V	5
Fraxinus excelsior	3	3	3	3	3	V	3
Dactylis glomerata	5	4		7	7	IV	4 to 7
Ranunculus ficaria	4	4		5	4	IV	4 to 5
Hyacinthoides non-scripta	3	3	4		4	IV	3 to 4
Rumex sanguineus	3		4		4	III	3 to 4
Rumex obtusifolius				3	4	II	3 to 4
Trifolium repens			4		3	II	3 to 4
Poa annua		4		4		II	4

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Stellaria media	3			3		II	3
Lolium perenne				6		I	6
Holcus lanatus			5			I	5
Cerastium fontanum			4			I	4
Ranunculus acris			4			I	4
Ranunculus repens			4			I	4
Urtica dioica			4			I	4
Prunus spinosa	3					I	3
Rubus fruticosus agg.	3					I	3
Bare ground %	5	5	5	5	5		
Description	Woodland represents grassland with scattered trees. No understorey. Ground layer dominated by grasses. Canopy approx. 10m in height.						
Management	Evidence of cattle grazing						

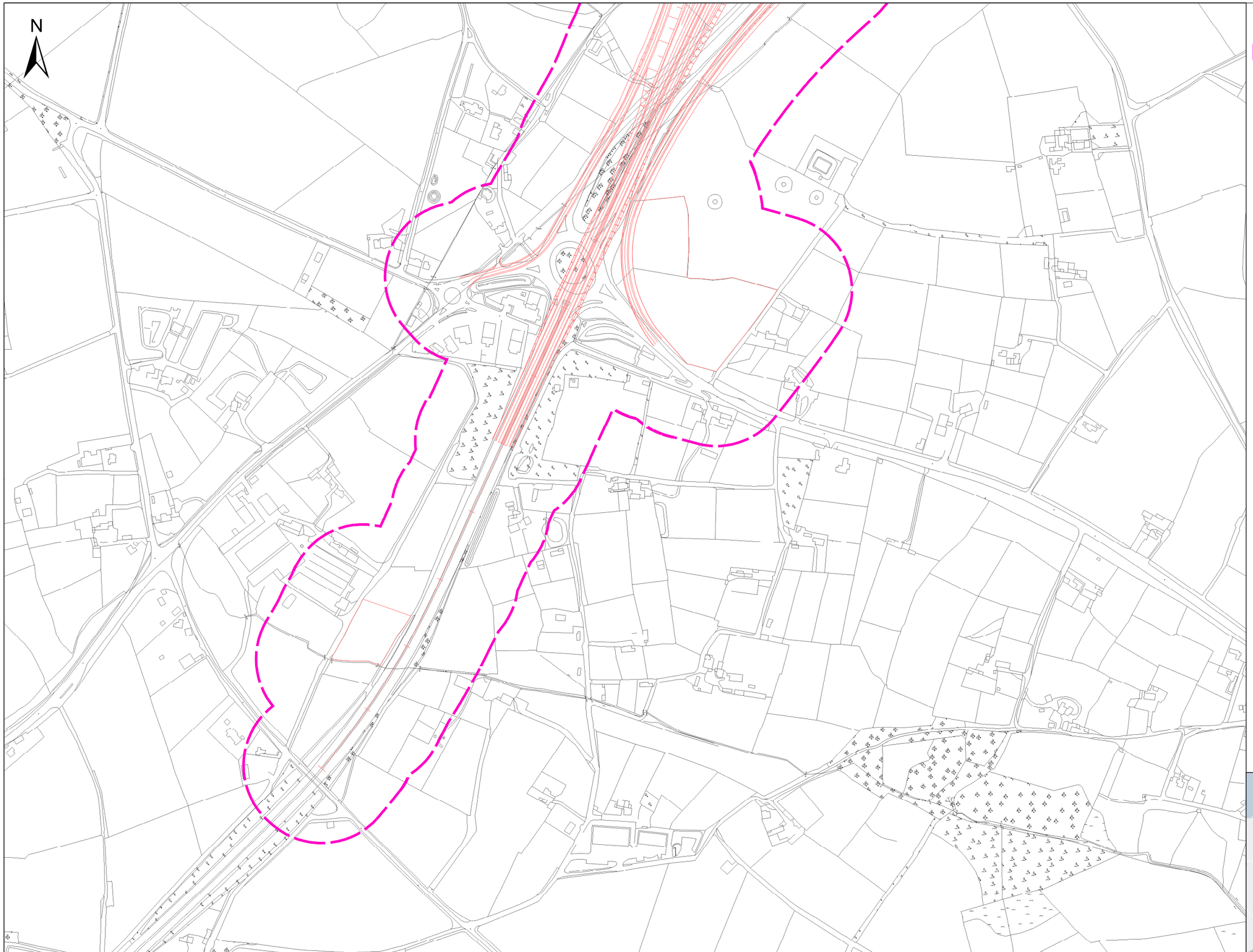
Table 4.13 Site 11 – Stand 1

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Fagus sylvatica	10	10	10	10	10	V	10
Ilex aquifolium	10	10	10	10	10	V	10
Dryopteris dilatata		5	5	7	7	IV	5 to 7
Hedera helix		6		6	6	III	6
Lonicera periclymenum	4					I	4
Mnium hornum	4					I	4
Rubus fruticosus agg.			7			I	7
Bare ground %	40	20	15	10	40		
Description	Beech woodland with sparse understorey and ground layer. Graduates into plantation larch and spruce to the east.						
Management	Evidence of felling						

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Trifolium repens			4		3	II	3 to 4
Poa annua		4		4		II	4
Stellaria media	3			3		II	3
Lolium perenne				6		I	6
Holcus lanatus			5			I	5
Cerastium fontanum			4			I	4
Ranunculus acris			4			I	4
Ranunculus repens			4			I	4
Urtica dioica			4			I	4
Prunus spinosa	3					I	3
Rubus fruticosus agg.	3					I	3
Bare ground %	5	5	5	5	5		
Description	Woodland represents grassland with scattered trees. No understorey. Ground layer dominated by grasses. Canopy approx. 10m in height.						
Management	Evidence of cattle grazing						

Table 4.13 Site 11 – Stand 1

SCIENTIFIC NAME	Q1	Q2	Q3	Q4	Q5	FREQUENCY	RANGE
Fagus sylvatica	10	10	10	10	10	V	10
Ilex aquifolium	10	10	10	10	10	V	10
Dryopteris dilatata		5	5	7	7	IV	5 to 7
Hedera helix		6		6	6	III	6
Lonicera periclymenum	4					I	4
Mnium hornum	4					I	4
Rubus fruticosus agg.			7			I	7
Bare ground %	40	20	15	10	40		
Description	Beech woodland with sparse understorey and ground layer. Graduates into plantation larch and spruce to the east.						
Management	Evidence of felling						

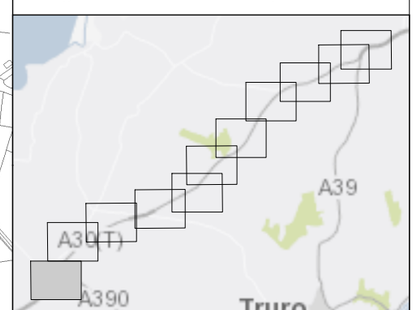


Proposed Route

100m Study Area

0 62.5 125 250

Metres



Rev	Date	Description	By	Chk	App	Notes:

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Client: WSP

Project: A30 CHIVERTON TO CARLAND CROSS

Title: THE SCHEME AND SCOPING FOR BOTANTICAL SURVEYS PAGE 1 OF 11

Drawn: JSdS		Checked: ET	
Designed: GH		Approved: UD	
Date: 29/09/2017	Scale: 1:5,000	A3	Sheet:
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70004582		Figure 1	

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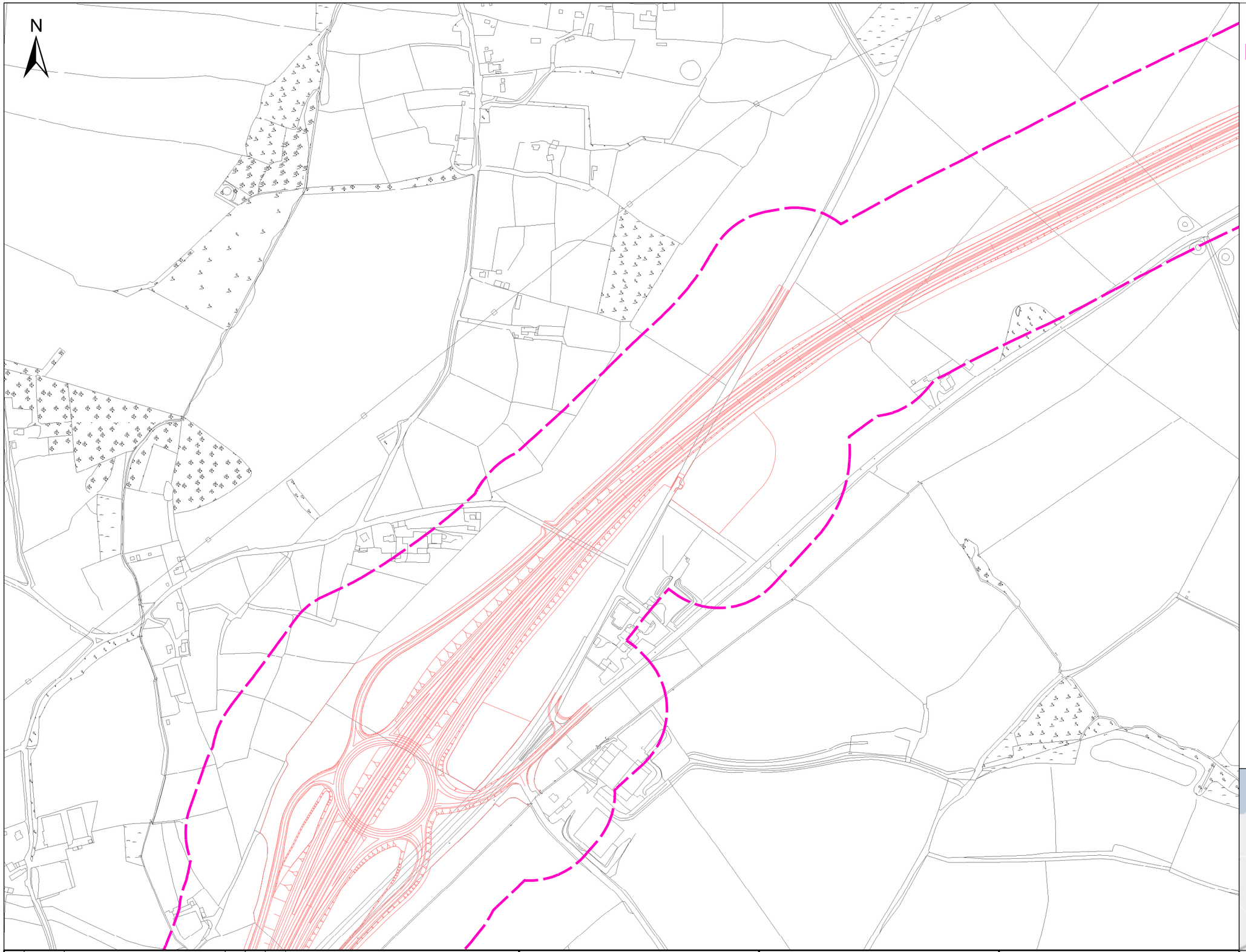
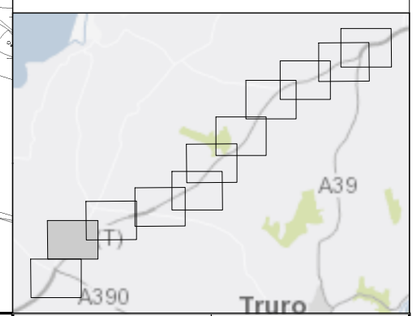


Proposed Route

100m Study Area

0 62.5 125 250

Metres



Rev	Date	Description	By	Chk	App

Notes:

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1 Queen Street, Bristol
BS2 0HQ
Tel: 44-(0)117-930-6200

Client: WSP

Project: A30 CHIVERTON TO CARLAND CROSS

Title: THE SCHEME AND SCOPING FOR BOTANTICAL SURVEYS PAGE 2 OF 11

Drawn: JSdS		Checked: ET	
Designed: GH		Approved: UD	
Date: 29/09/2017	Scale: 1:5,000	A3	Sheet:
Project Number:	Drawing Number:		Revision:
70004582	Figure 1		

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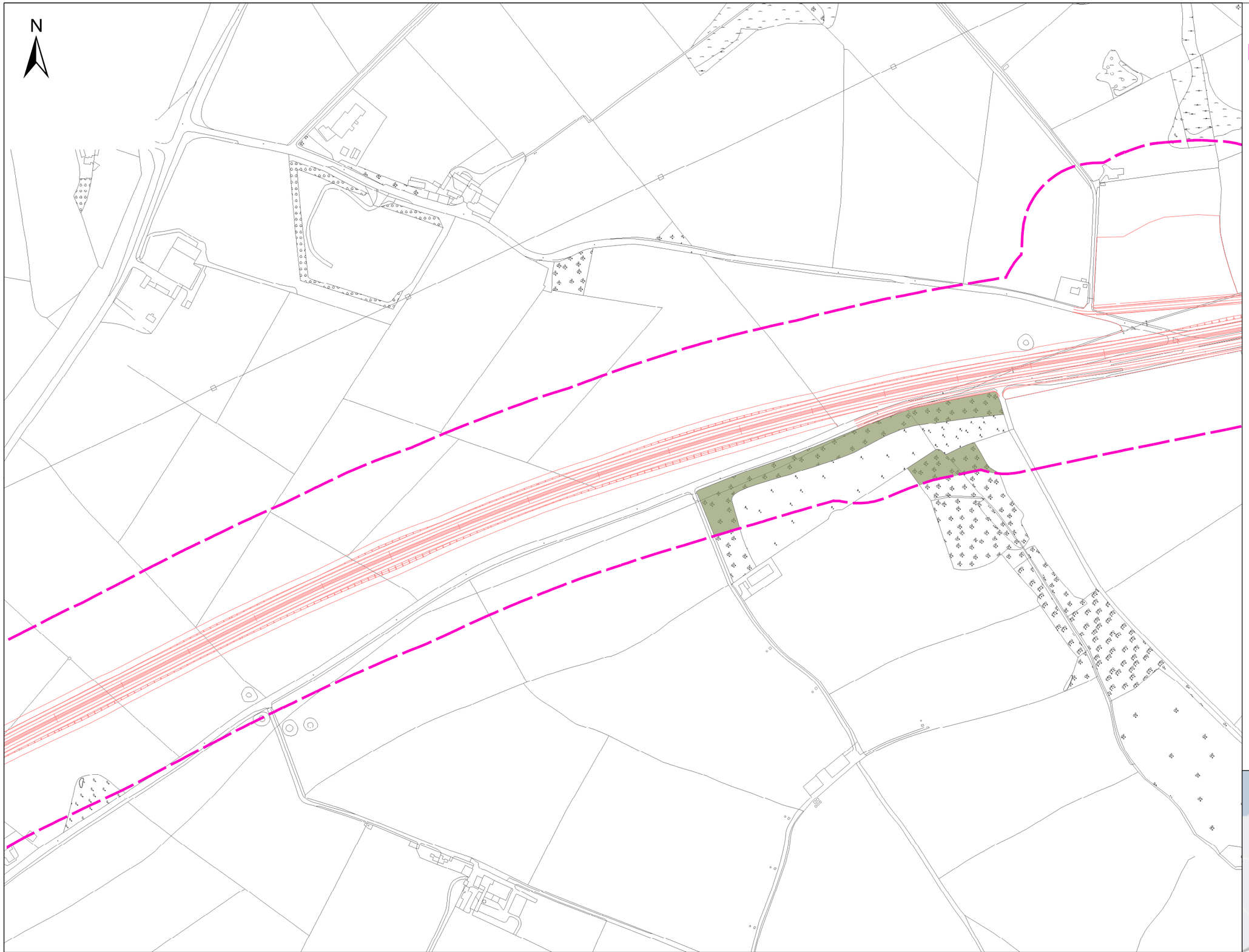


Proposed Route

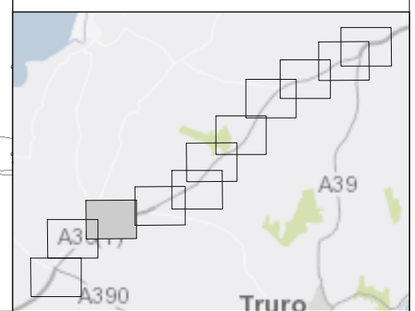
100m Study Area

Habitats of Principal Importance

Deciduous woodland

0 62.5 125 250

Metres



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Project: A30 CHIVERTON TO CARLAND CROSS

Title: THE SCHEME AND SCOPING FOR BOTANTICAL SURVEYS PAGE 3 OF 11

Drawn: JSdS		Checked: ET	
Designed: GH		Approved: UD	
Date: 29/09/2017	Scale: 1:5,000	A3	Sheet:
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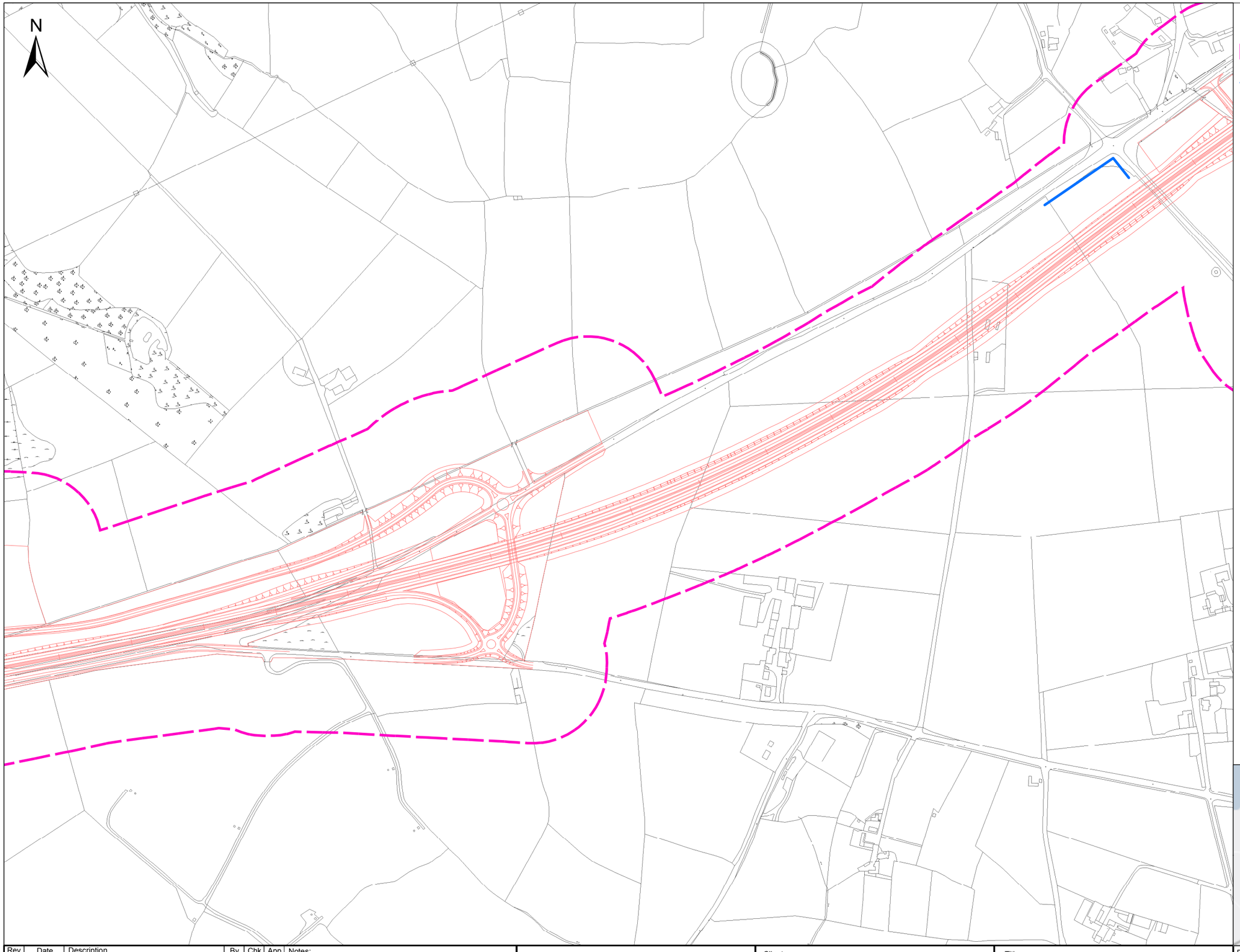


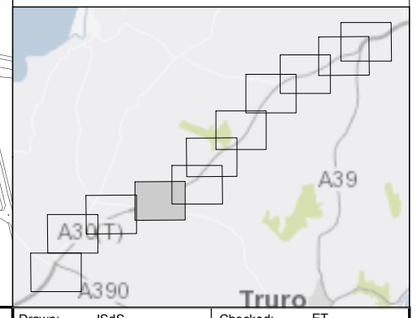
Proposed Route

100m Study Area

Roadside Inventory - no longer in existence (BS315)

0 62.5 125 250

Metres



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Project: A30 CHIVERTON TO CARLAND CROSS

Title: THE SCHEME AND SCOPING FOR BOTANTICAL SURVEYS PAGE 4 OF 11

Drawn: JSdS	Checked: ET		
Designed: GH	Approved: UD		
Date: 29/09/2017	Scale: 1:5,000	A3	Sheet:
Project Number:	Drawing Number:		Revision:
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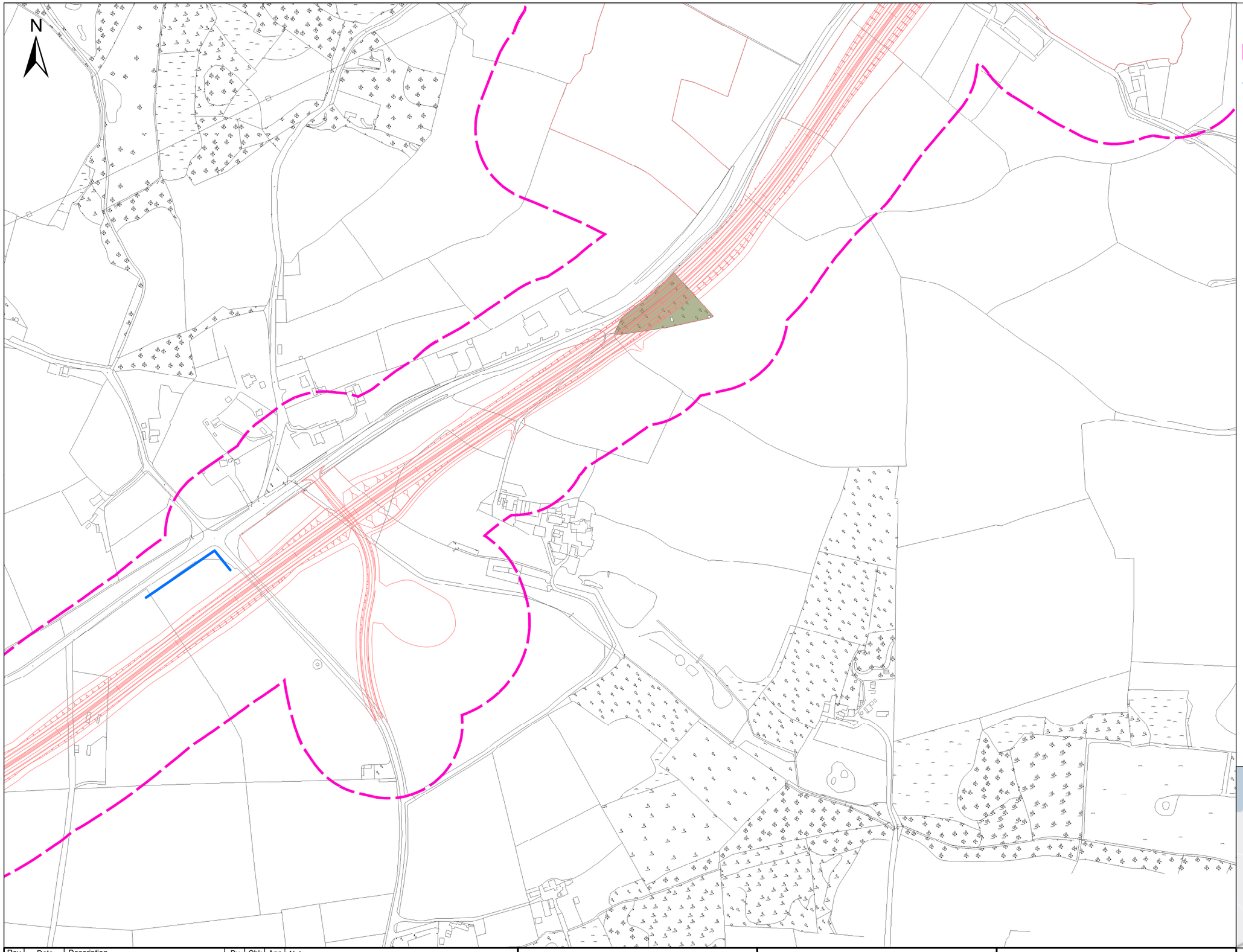


Proposed Route

100m Study Area

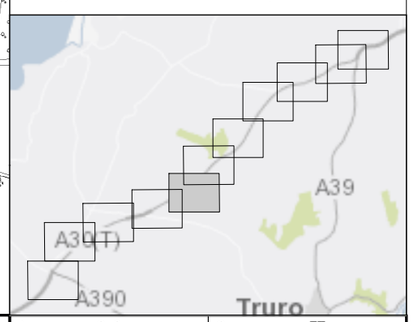
Roadside Inventory - no longer in existence (BS315)

Habitats of Principal Importance

Deciduous woodland

0 62.5 125 250

Metres



Rev	Date	Description	By	Chk	App

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Project: A30 CHIVERTON TO CARLAND CROSS

Title: THE SCHEME AND SCOPING FOR BOTANTICAL SURVEYS PAGE 5 OF 11

Drawn: JSdS		Checked: ET	
Designed: GH		Approved: UD	
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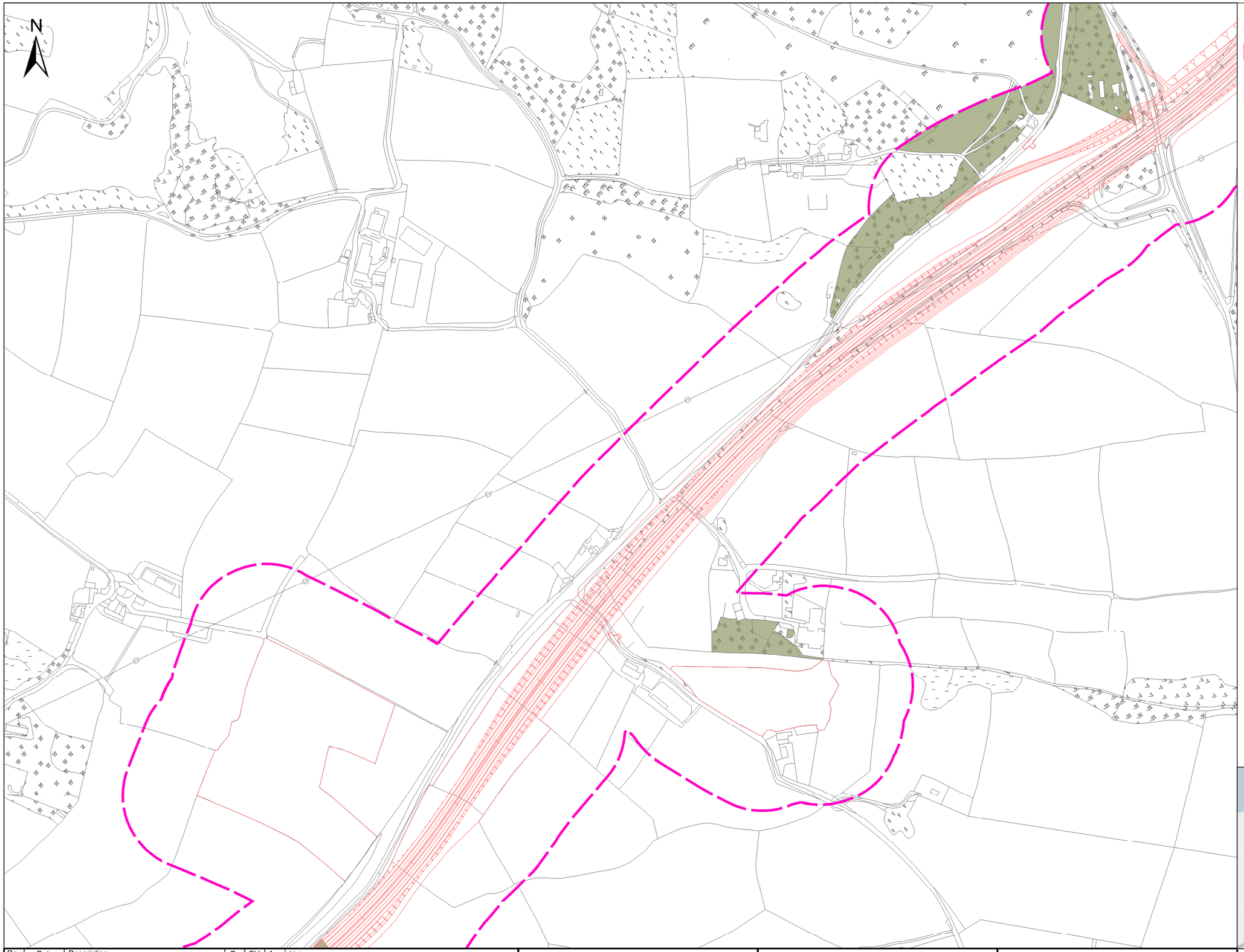


Proposed Route

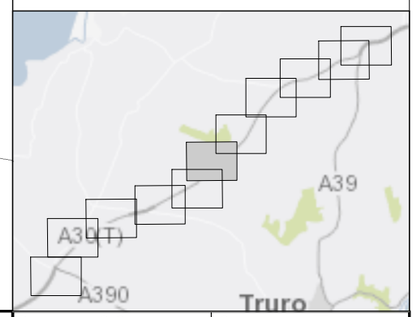
100m Study Area

Habitats of Principal Importance

Deciduous woodland

0 62.5 125 250

Metres



Rev	Date	Description	By	Chk	App

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Project: A30 CHIVERTON TO CARLAND CROSS

Title: THE SCHEME AND SCOPING FOR BOTANTICAL SURVEYS PAGE 6 OF 11

Drawn: JSdS		Checked: ET	
Designed: GH		Approved: UD	
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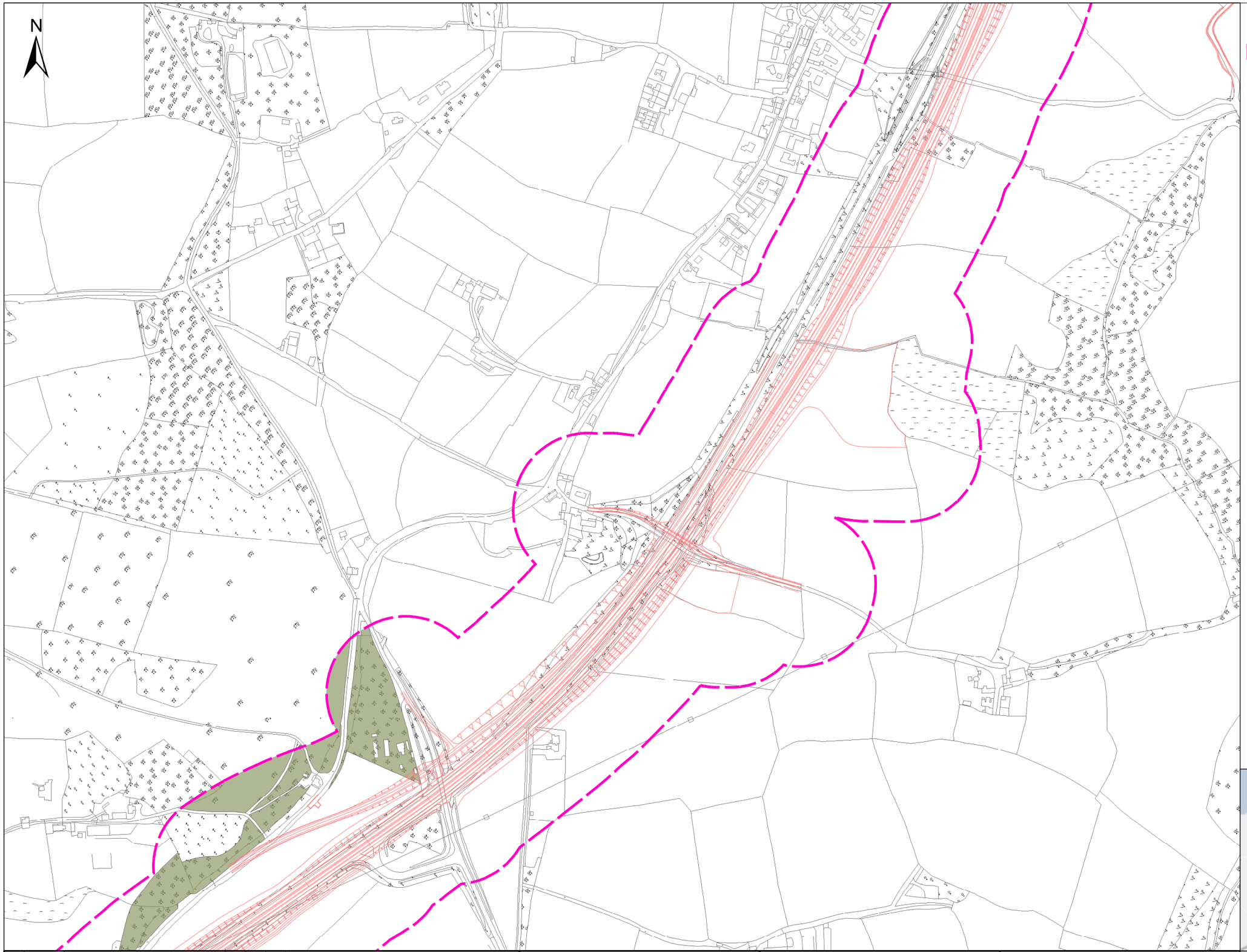


Proposed Route

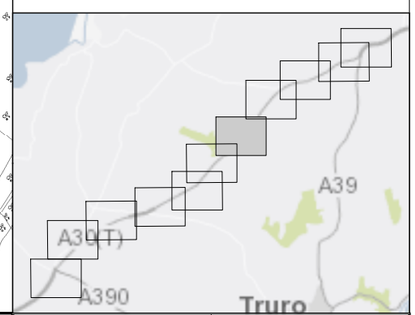
100m Study Area

Habitats of Principal Importance

Deciduous woodland

0 62.5 125 250

Metres



Rev	Date	Description	By	Chk	App	Notes:

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Project: A30 CHIVERTON TO CARLAND CROSS

Title: THE SCHEME AND SCOPING FOR BOTANTICAL SURVEYS PAGE 7 OF 11

Drawn: JSdS		Checked: ET	
Designed: GH		Approved: UD	
Date: 29/09/2017	Scale: 1:5,000	A3	Sheet:
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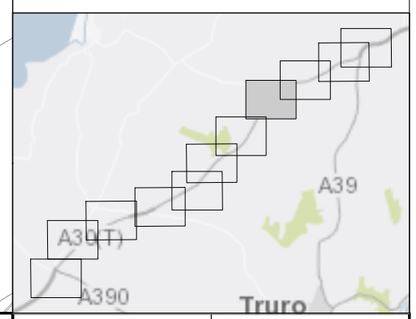
N

Proposed Route

100m Study Area

0 62.5 125 250

Metres



Rev	Date	Description	By	Chk	App

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Project: A30 CHIVERTON TO CARLAND CROSS

Title: THE SCHEME AND SCOPING FOR BOTANTICAL SURVEYS PAGE 8 OF 11

Drawn: JSdS		Checked: ET	
Designed: GH		Approved: UD	
Date: 29/09/2017	Scale: 1:5,000	A3	Sheet:
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N

Proposed Route

100m Study Area

Roadside Inventory (BS316)

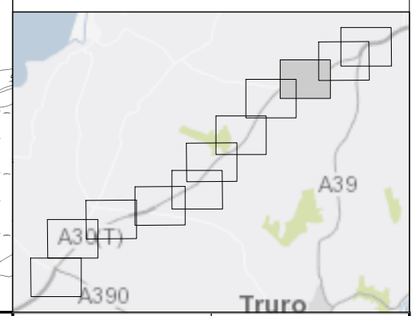
Habitats of Principal Importance

Deciduous woodland

Lowland heathland

0 62.5 125 250

Metres



Rev	Date	Description	By	Chk	App

Notes:

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Client: WSP

Project: A30 CHIVERTON TO CARLAND CROSS

Title: THE SCHEME AND SCOPING FOR BOTANTICAL SURVEYS PAGE 9 OF 11

Drawn: JSdS		Checked: ET	
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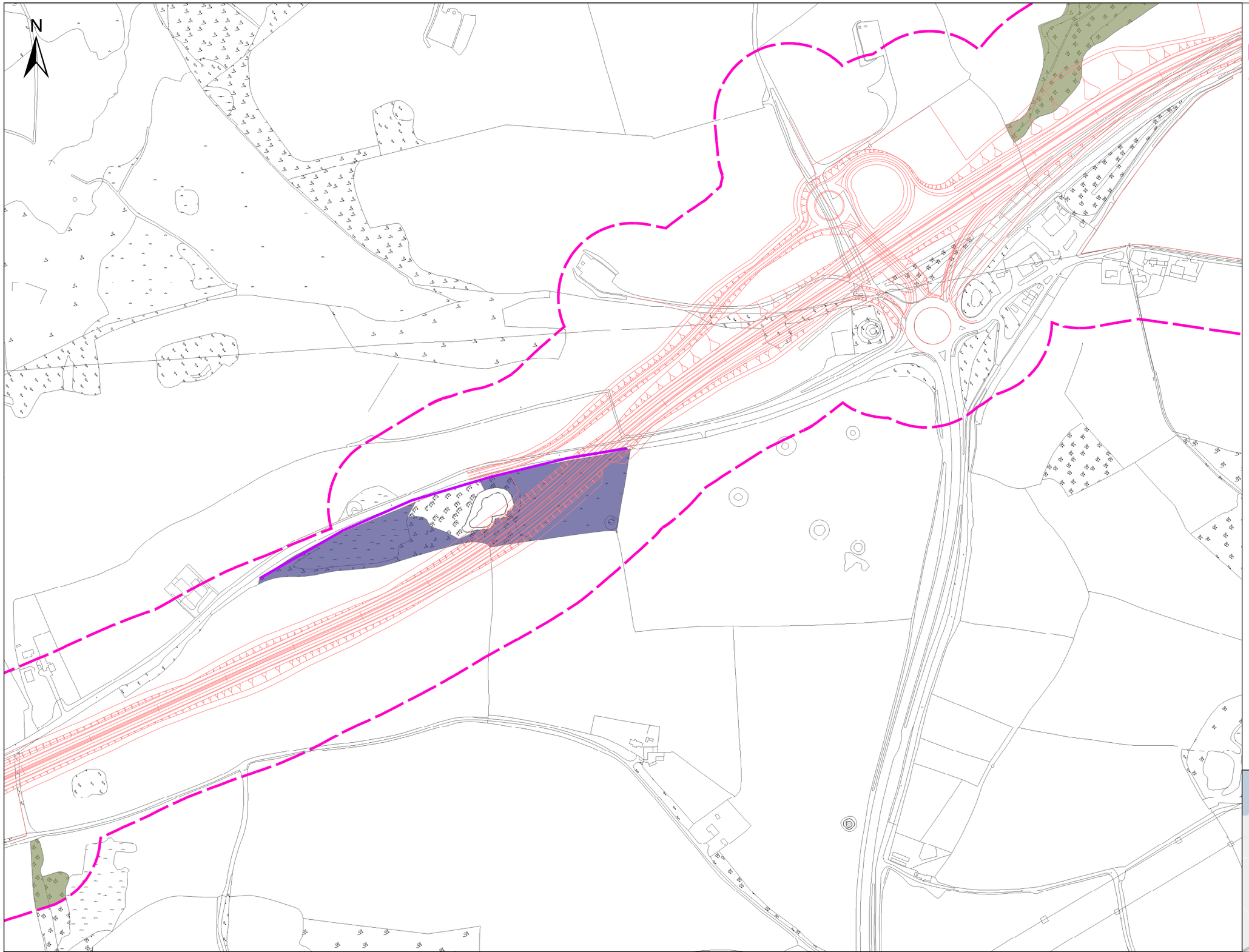


Proposed Route

100m Study Area

Roadside Inventory (BS316)

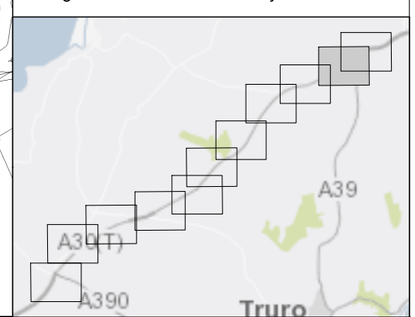
Habitats of Principal Importance

Deciduous woodland

Lowland heathland

0 62.5 125 250

Metres



Rev	Date	Description	By	Chk	App
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Client: WSP

Project: A30 CHIVERTON TO CARLAND CROSS

Title: THE SCHEME AND SCOPING FOR BOTANTICAL SURVEYS PAGE 10 OF 11

Drawn: JSdS		Checked: ET	
Designed: GH		Approved: UD	
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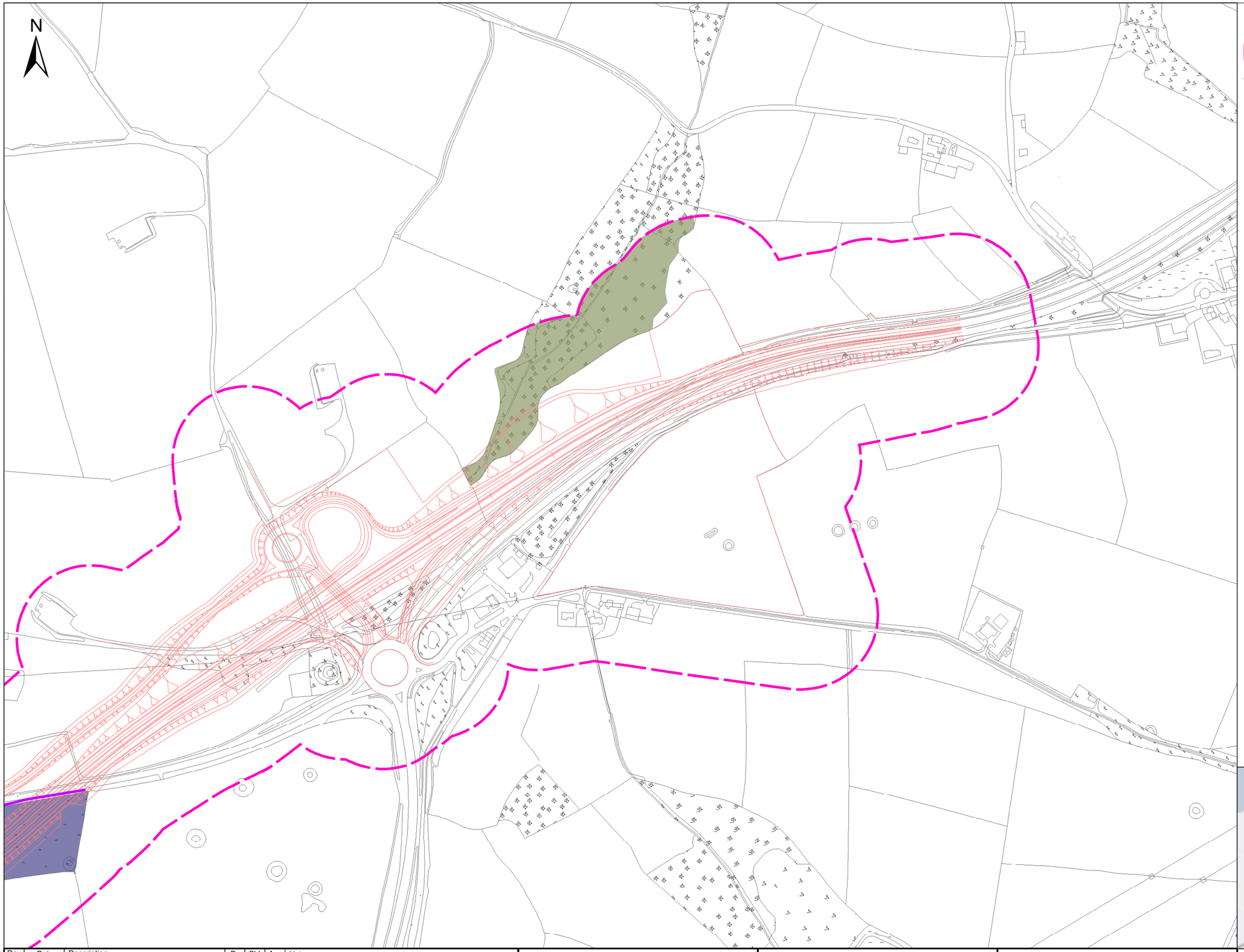


Proposed Route

100m Study Area

Roadside Inventory (BS316)

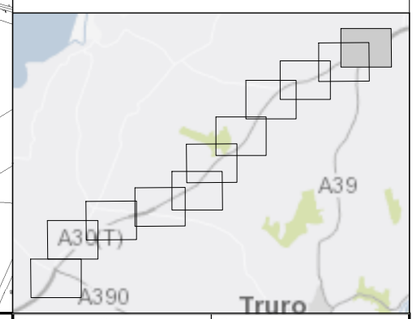
Habitats of Principal Importance

Deciduous woodland

Lowland heathland

0 62.5 125 250

Metres



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Title: THE SCHEME AND SCOPING FOR BOTANTICAL SURVEYS PAGE 11 OF 11

Drawn: JSdS		Checked: ET	
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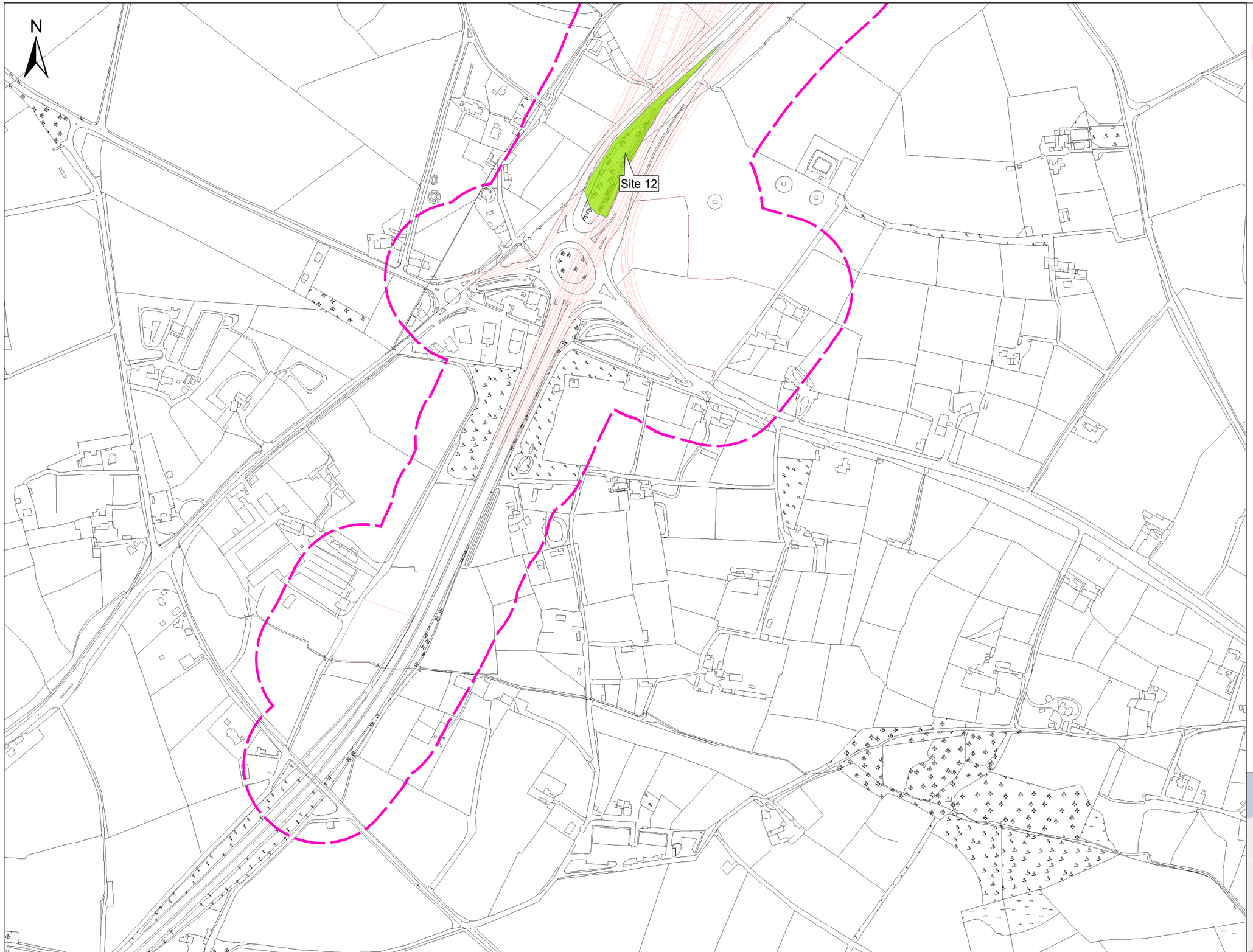


Proposed Route

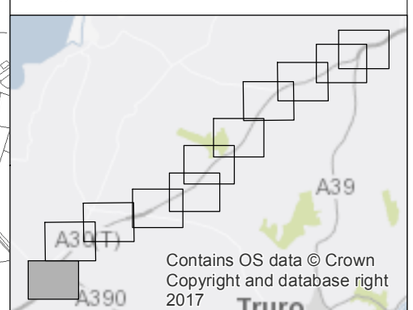
100m Study Area

Quadrat locations

Broad-leaved woodland

0 62.5 125 250

Metres



Rev	Date	Description	By	Chk	App

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Project: A30 CHIVERTON TO CARLAND CROSS

Title: HEATHLAND AND WOODLAND SURVEY RESULTS PAGE 1 OF 11

Drawn: JSdS		Checked: ET	
Designed: GH		Approved: UD	
Date: 02/11/2017	Scale: 1:5,000	A3	Sheet:
Project Number: 70004582	Drawing Number: FIGURE 2		Revision:

Login: DeSouzaJ
Plot Date: 02/11/2017
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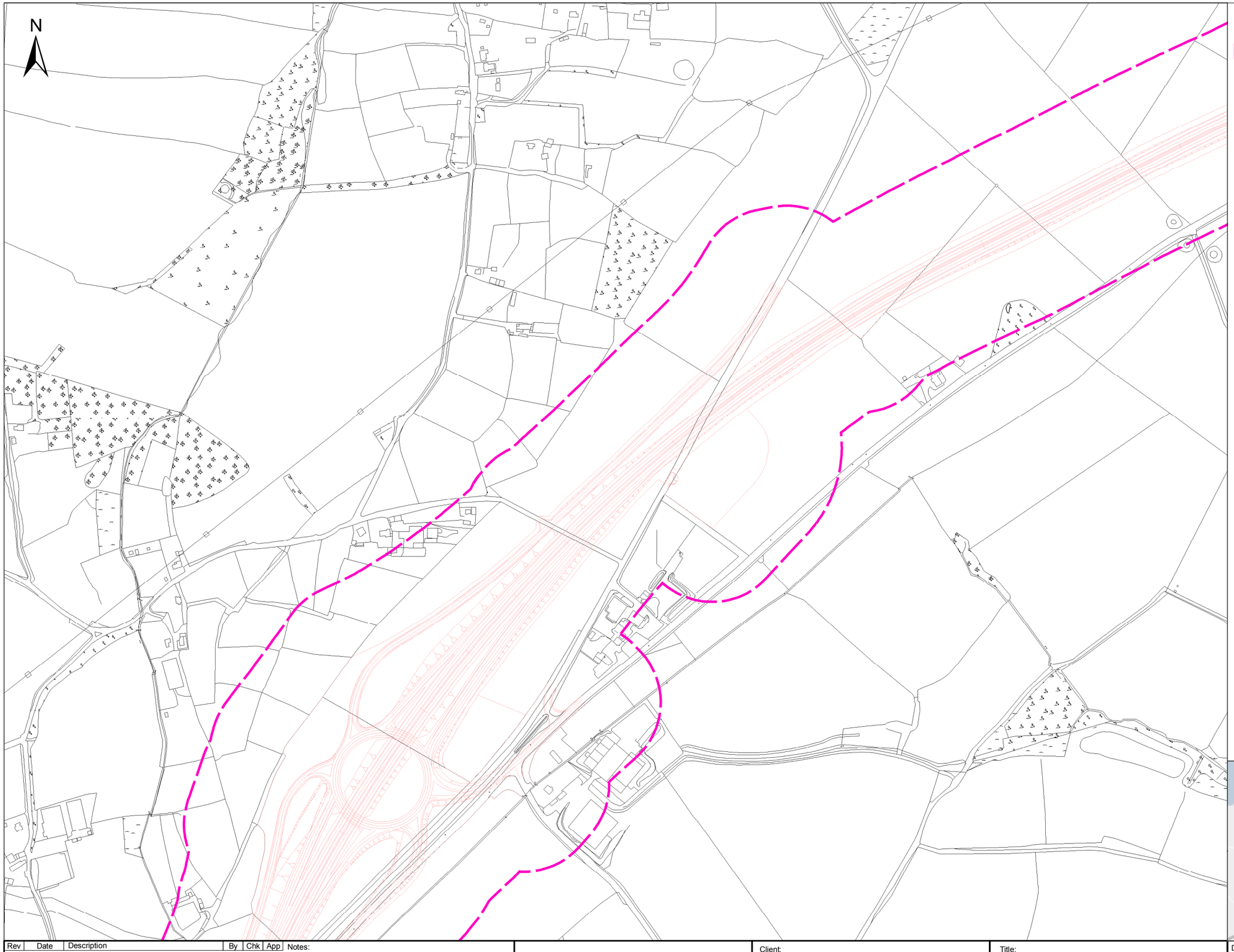


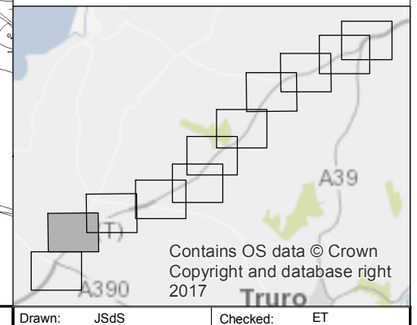
Proposed Route

100m Study Area

Quadrat locations

0 62.5 125 250

Metres



Rev	Date	Description	By	Chk	App

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Project: A30 CHIVERTON TO CARLAND CROSS

Title: HEATHLAND AND WOODLAND SURVEY RESULTS PAGE 2 OF 11

Drawn: JSdS		Checked: ET	
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Project Number:	Drawing Number:		Revision:
70004582	FIGURE 2		

Login: DeSouzaJ
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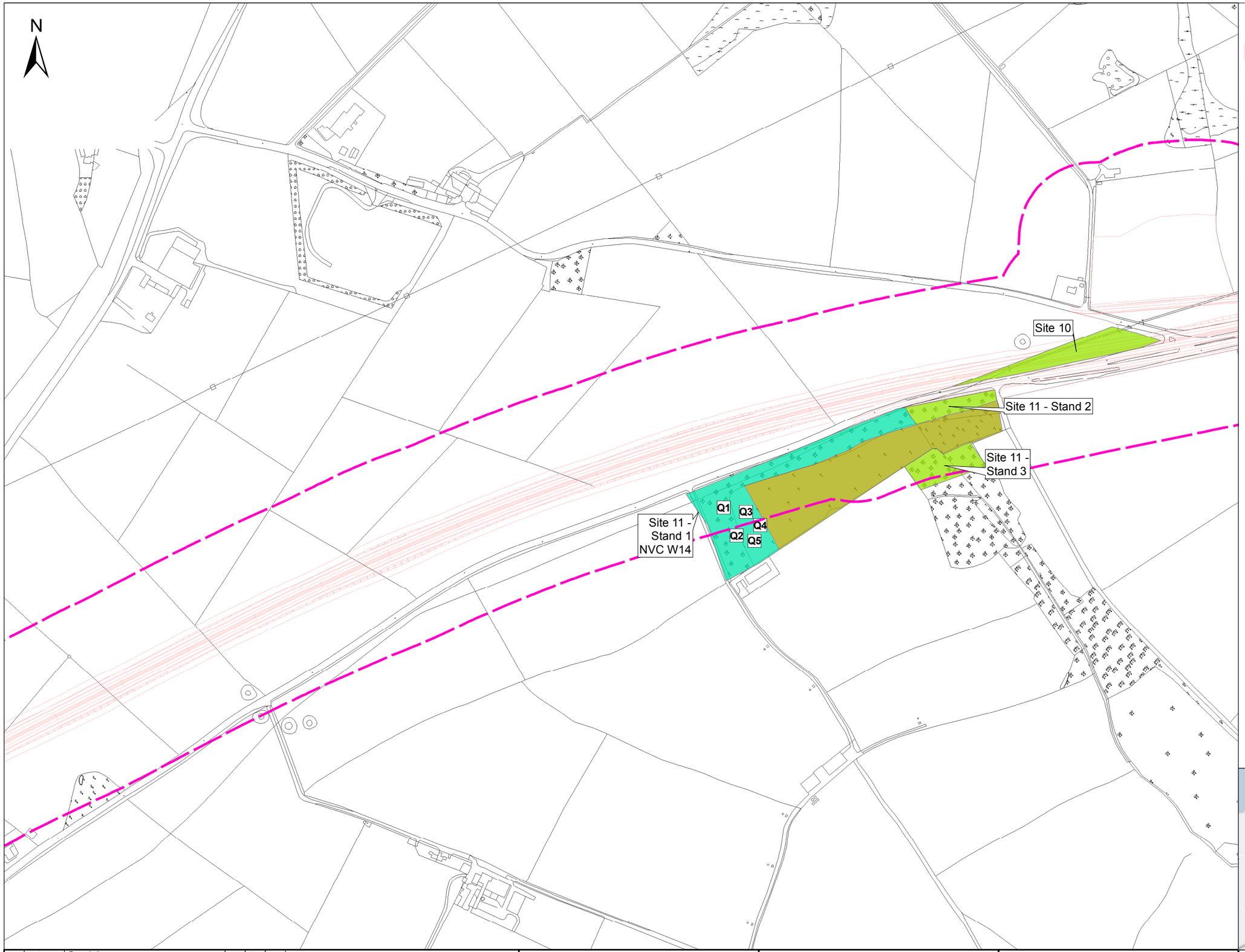


Proposed Route

100m Study

Quadrat locations

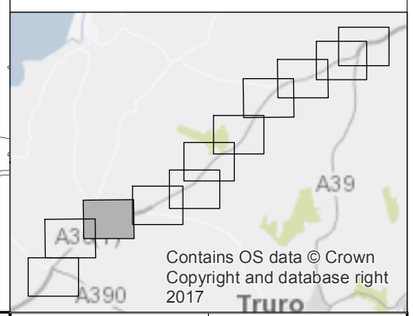
Broad-leaved woodland

Broad-leaved woodland NVC W14 Fagus sylvatica - Rubus fruticosus woodland

Coniferous Woodand

0 62.5 125 250

Metres



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Project: A30 CHIVERTON TO CARLAND CROSS

Title: HEATHLAND AND WOODLAND SURVEY RESULTS PAGE 3 OF 11

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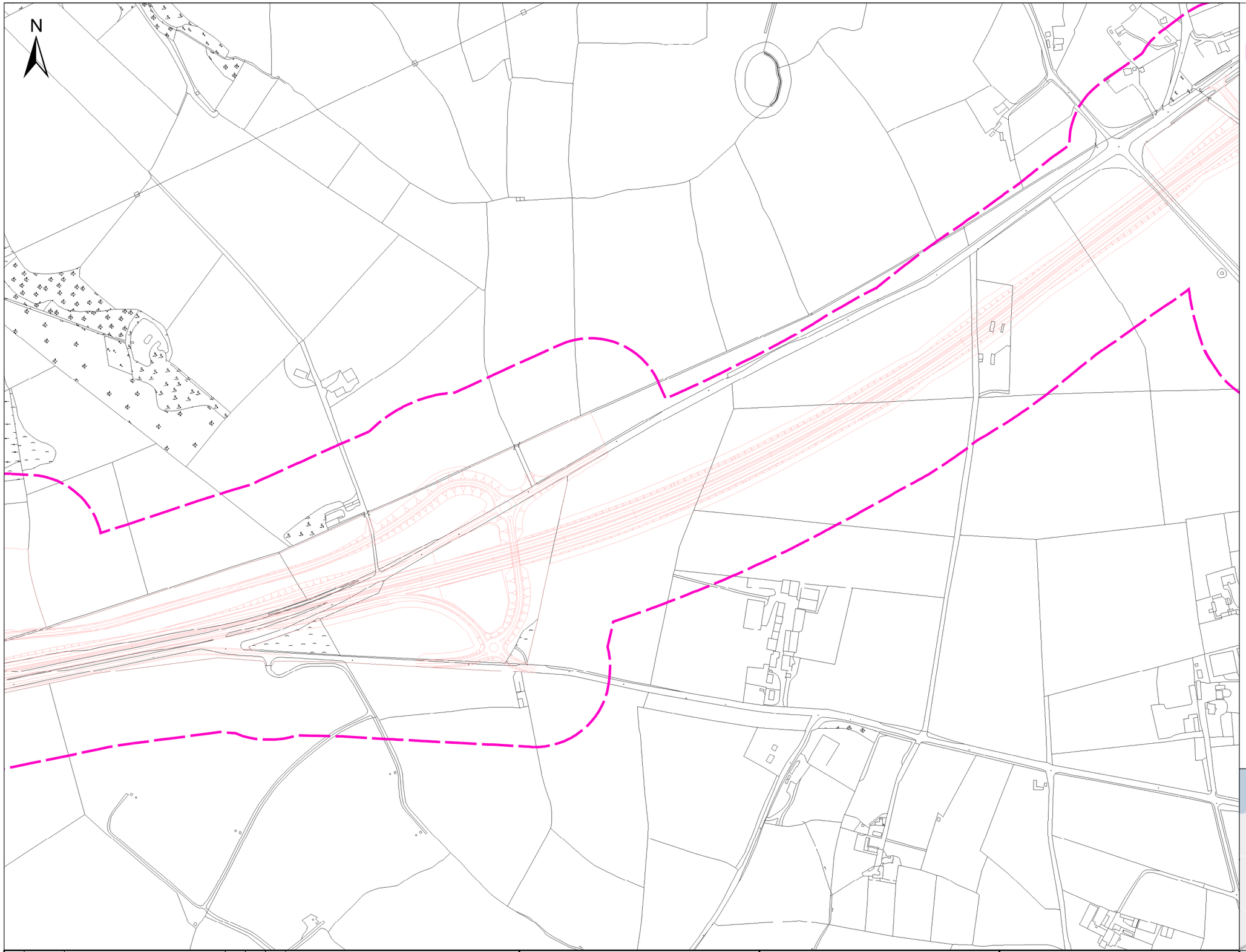


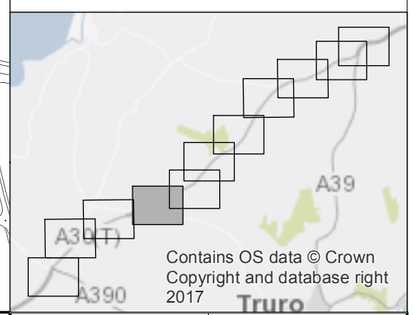
Proposed Route

100m Study Area

Quadrat locations

0 62.5 125 250

Metres



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Project: A30 CHIVERTON TO CARLAND CROSS

Title: HEATHLAND AND WOODLAND SURVEY RESULTS PAGE 4 OF 11

Drawn: JSdS		Checked: ET	
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Date: 02/11/2017	Scale: 1:5,000	A3	Sheet:
Project Number:		Drawing Number:	Revision:
70004582		FIGURE 2	

Login: DeSouzaJ
Plot Date: 02/11/2017
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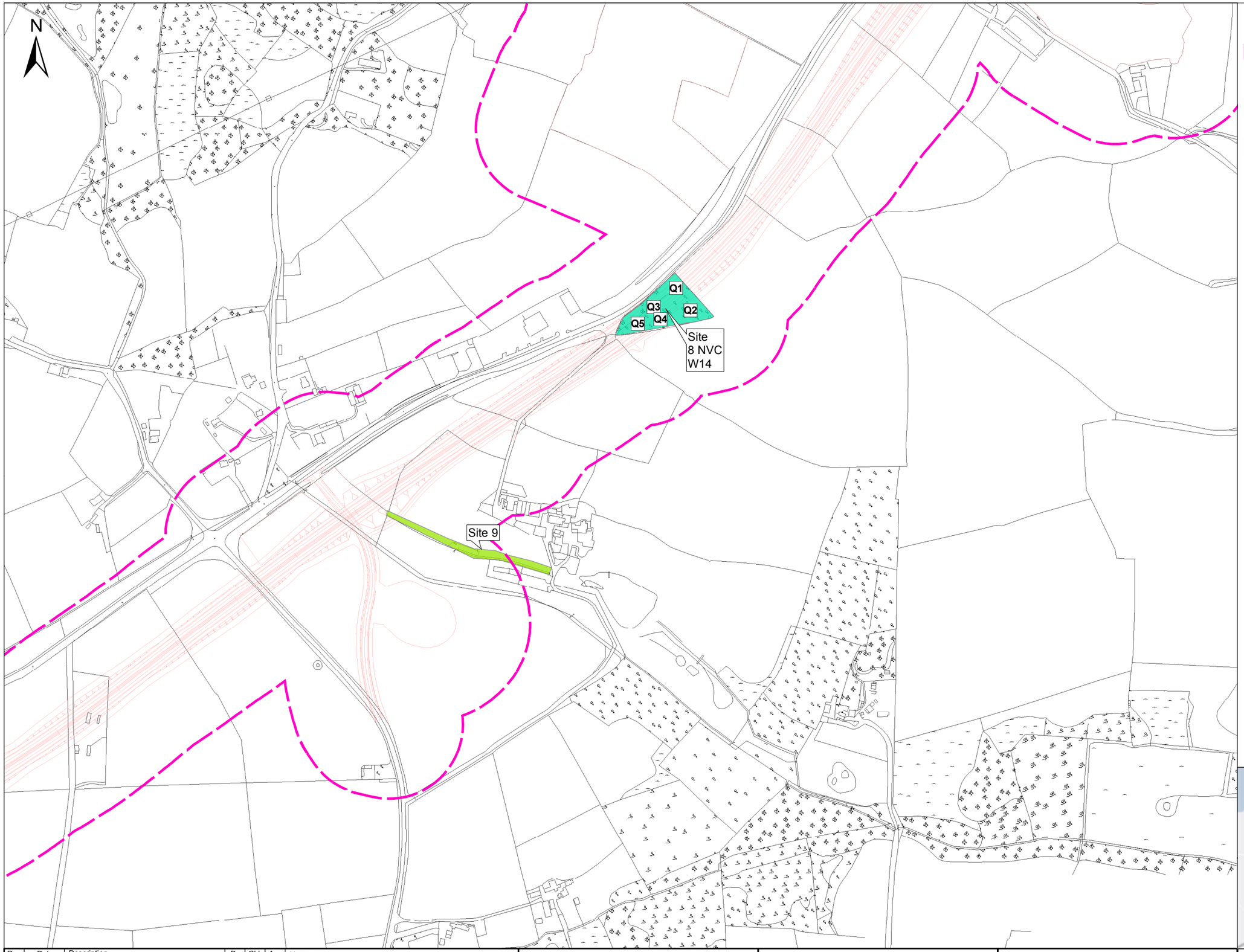


Proposed Route

100m Study

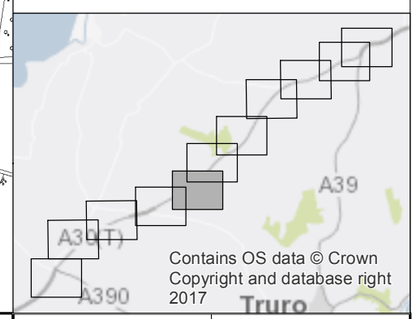
Quadrat locations

Broad-leaved

Broad-leaved woodland NVC W14 Fagus sylvatica - Rubus fruticosus woodland

0 62.5 125 250

Metres



Rev	Date	Description	By	Chk	App

Notes:

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Project: A30 CHIVERTON TO CARLAND CROSS

Title: HEATHLAND AND WOODLAND SURVEY RESULTS PAGE 5 OF 11

Drawn: JSdS		Checked: ET	
Designed: GH		Approved: UD	
Date: 02/11/2017	Scale: 1:5,000	A3	Sheet:
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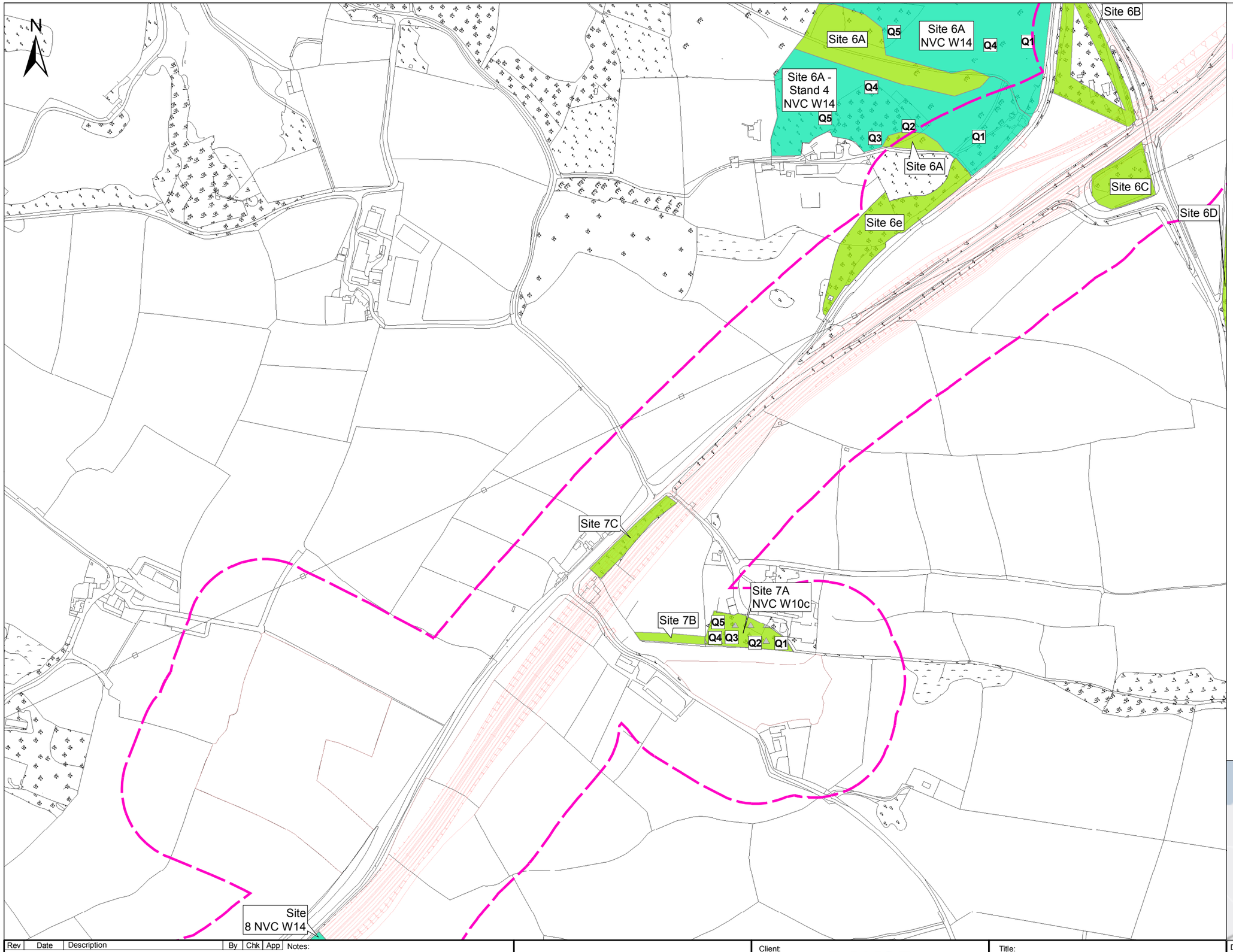

Proposed Route

100m Study Area

Quadrat locations

Broad-leaved woodland

Broad-leaved woodland NVC W10c Quercus robur - Pteridium acquilinum - Rubus fruticosus woodland, Hedera helix

Broad-leaved woodland NVC W14 Fagus sylvatica - Rubus fruticosus woodland

0 62.5 125 250

Metres

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Title: HEATHLAND AND WOODLAND SURVEY RESULTS PAGE 6 OF 11

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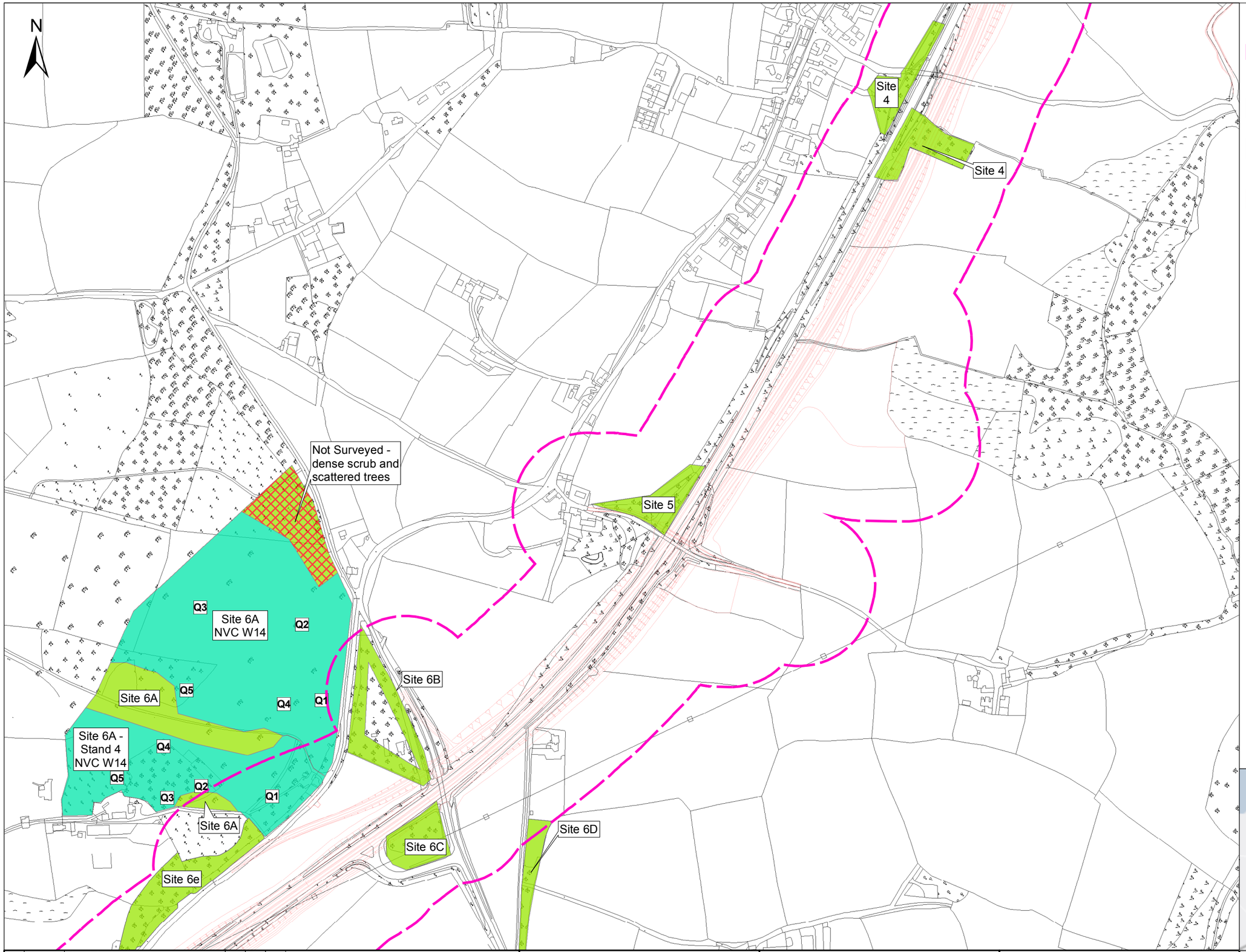


Proposed Route

100m Study Area

Quadrat locations

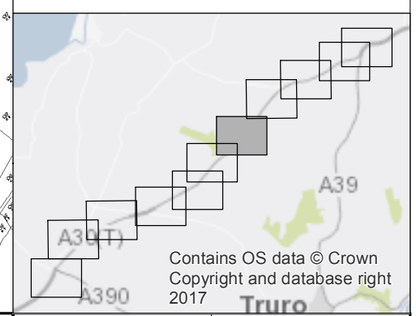
Broad-leaved woodland

Broad-leaved woodland NVC W14 Fagus sylvatica - Rubus fruticosus woodland

Broad-leaved woodland Not Surveyed - Dense Scrub and scattered trees

0 62.5 125 250

Metres



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Title: HEATHLAND AND WOODLAND SURVEY RESULTS PAGE 7 OF 11

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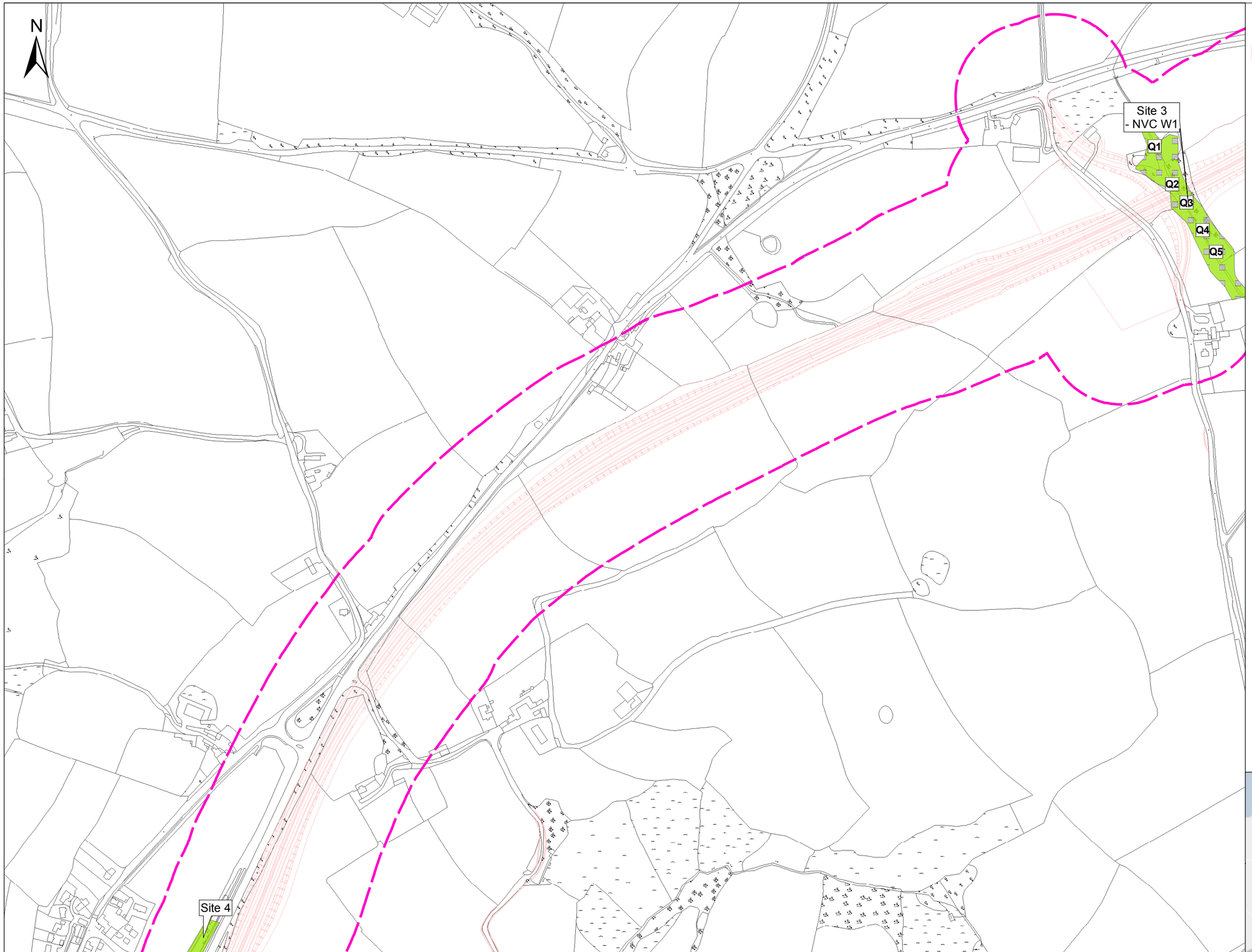


Proposed Route

100m Study Area

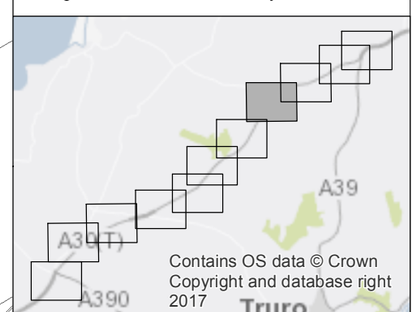
Quadrat locations

Broad-leaved woodland

Broad-leaved woodland NVC W1 Salix cinerea-Galium palustre community

0 62.5 125 250

Metres



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Title: HEATHLAND AND WOODLAND SURVEY RESULTS PAGE 8 OF 11

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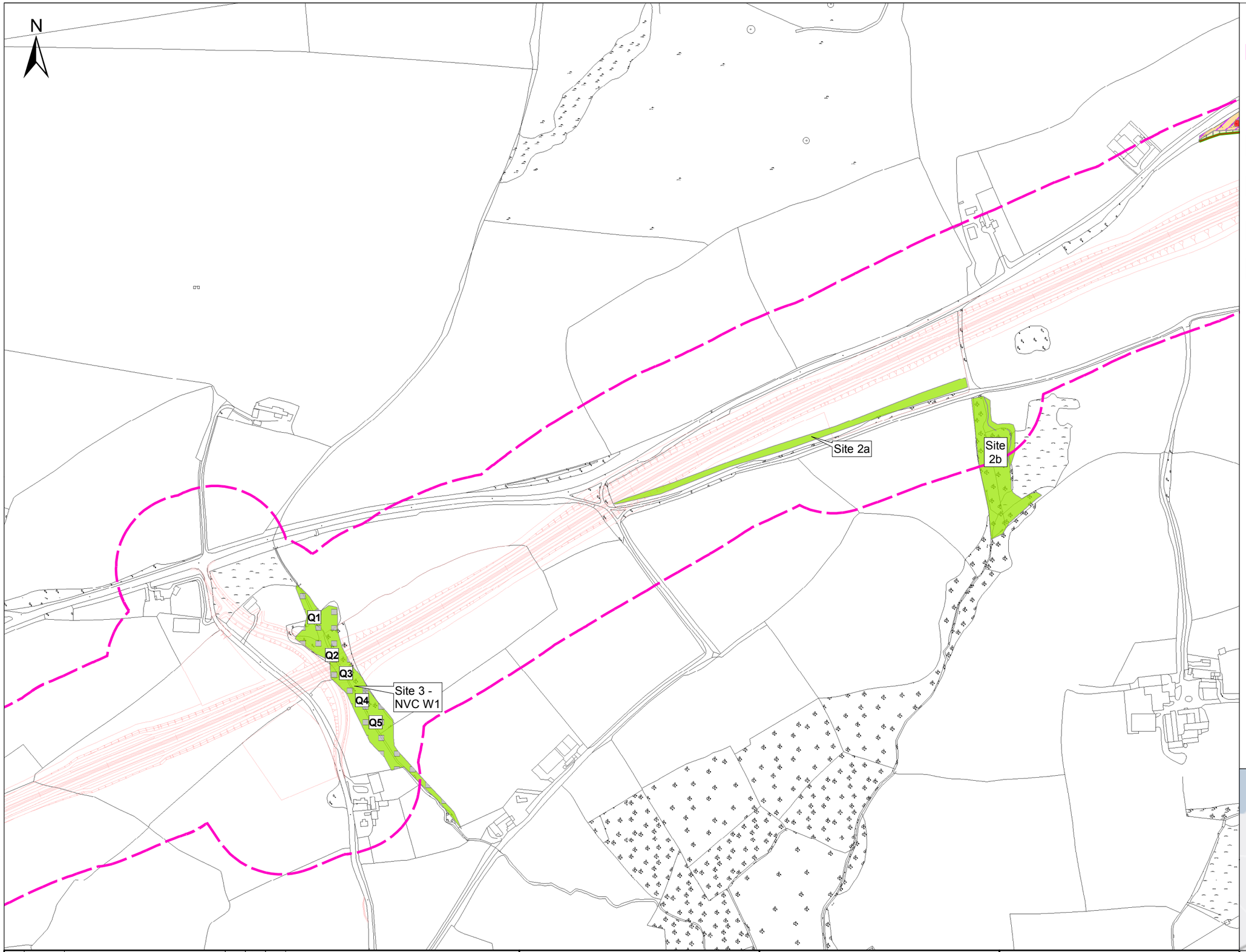


Proposed Route

100m Study Area

Quadrat locations

Hedgerow - W23 Ulex europaeus - Rubus fruticosus scrub

Broad-leaved woodland

Broad-leaved woodland NVC W1 Salix cinerea-Galium palustre community

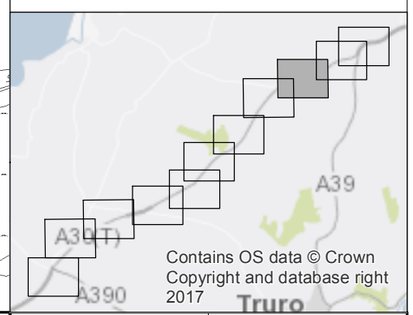
Erica ciliaris (Dorset heath) location (Recorded 5th August 2017)

H4 Ulex gallii - Agrostis curtisii heath

Scrub and braken not subject to NVC survey

0 62.5 125 250

Metres



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Title: HEATHLAND AND WOODLAND SURVEY RESULTS PAGE 9 OF 11

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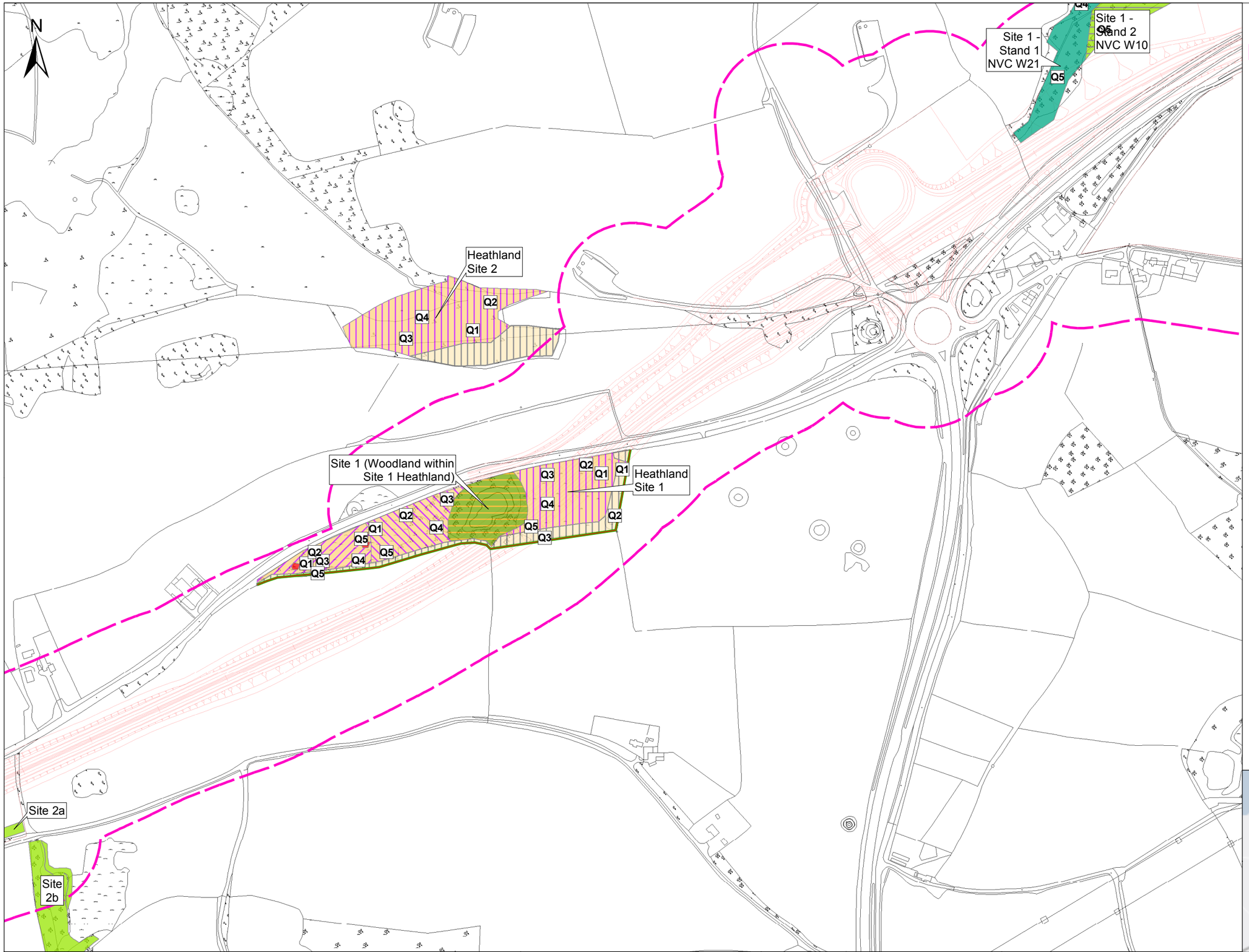


Proposed Route

100m Study Area

Quadrat locations

Hedgerow - W23 Ulex europaeus - Rubus fruticosus scrub

Broad-leaved woodland

Broad-leaved woodland NVC W10 Quercus robur - Pteridium acquilinum - Robus fruticosus woodland, with elements of the W10c Quercus robur - Pteridium acquilinum - Rubus fruticosus woodland, Hedrex helix sub-community

Broad-leaved woodland NVC W21 Crataegus monogyna-Hedra helix scrub community

Erica ciliaris (Dorset heath) location (Recorded 5th August 2017)

H4 Ulex gallii - Agrostis curtisii heath

H4 Ulex gallii - Agrostis curtisii heath, Agrostis curtisii - Erica cinerea sub-community

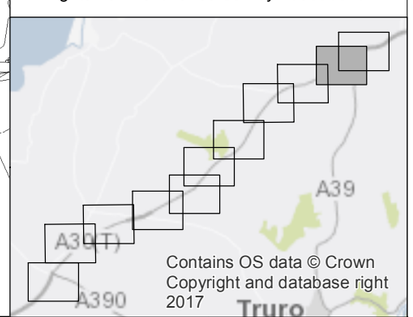
H4a Ulex gallii - Agrostis curtisii heath, Erica tetralix sub-community

Mixed Plantation Woodland with no clear affinity to a NVC community

Scrub and braken not subject to NVC survey

0 62.5 125 250

Metres



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Title: HEATHLAND AND WOODLAND SURVEY RESULTS PAGE 10 OF 11

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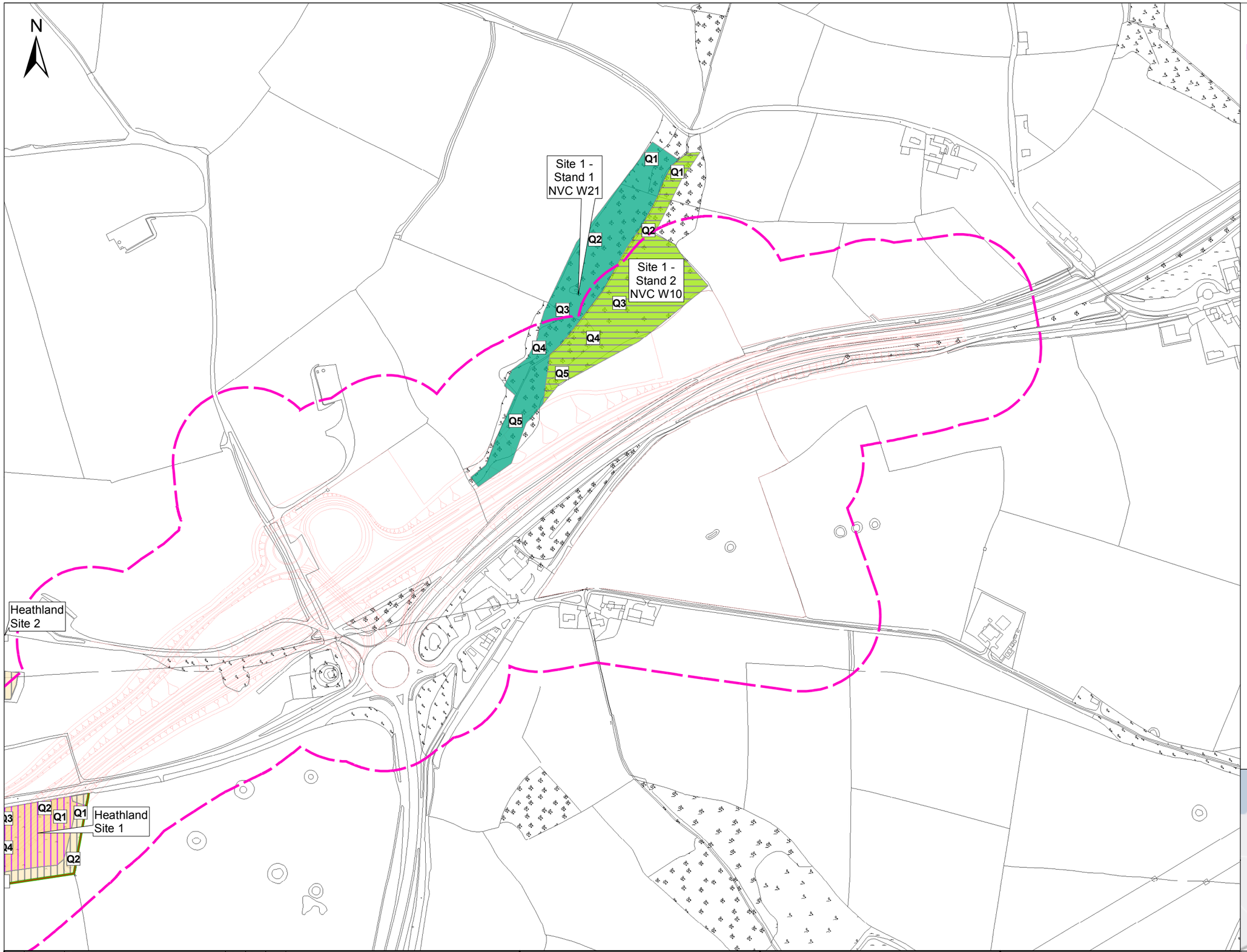


Proposed Route

100m Study Area

Quadrat locations

Hedgerow - W23 Ulex europaeus - Rubus fruticosus scrub

Broad-leaved woodland NVC W10 Quercus robur - Pteridium acquilinum - Robus fruticosus woodland, with elements of the W10c Quercus robur - Pteridium acquilinum - Rubus fruticosus woodland, Hedrex helix sub-community

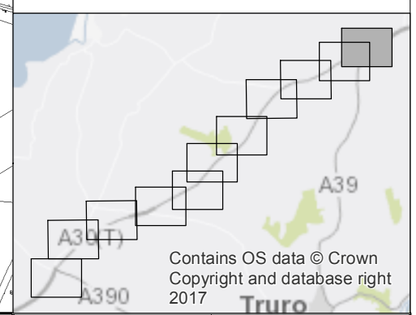
Broad-leaved woodland NVC W21 Crataegus monogyna-Hedra helix scrub community

H4a Ulex gallii - Agrostis curtisii heath, Erica tetralix sub-community

Scrub and braken not subject to NVC survey

0 62.5 125 250

Metres



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