Welsh Government

M4 Corridor around Newport

Environmental Statement Volume 3: Appendix 10.19

Phase 1 Habitat Survey 2015

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Contents

Figures

Annexes

Summary

S.1 RPS has undertaken a Phase 1 habitat survey of the route of the proposed M4 Corridor around Newport (M4CaN) between Castleton and Magor to inform the ecological baseline for environmental impact assessment (EIA) of the Scheme. The EIA is reported in the M4CaN Environmental Statement (ES), of which this document is an appendix to the chapter on Ecology and Nature Conservation.

S.2 An Extended Phase 1 habitat survey previously undertaken by Arup on behalf of Welsh Government in 2014 is reported separately in Appendix 10.2 of the ES. The survey area was based upon the proposed alignment of the new section of motorway, within areas not previously surveyed by Arup, together with an approximate 250 m corridor to either side. The extent of the 2015 survey area is shown on Figure 1.

S.3 This document reports the findings of the additional Phase 1 habitat survey, which was undertaken from May to September 2015 using standard Chartered Institute of Ecology and Environmental Management (CIEEM) and Joint Nature Conservation Committee (JNCC) methods. The habitats identified included the following.

- Semi-natural woodland and broadleaved plantation woodland (A1).
- Scrub (A2).
- Hedgerows (J2).
- Improved Grassland (B4).
- Arable Land (J1.1).
- Amenity Grassland (J1.2).
- Semi-improved Neutral Grassland (B2.2).
- Poor Semi-improved Grassland (B6).
- Marshy Grassland (Grazing Marsh) (B5).
- Waterbodies and Ditches (G1).
- Species-rich short ephemeral/perennial vegetation (J1.3).
- Saltmarsh (H2.6).
- Reedbeds (F1).
- Invasive Plants.

S.4 Habitat suitable for the following protected species was also noted during the survey.

- Bats.
- Great Crested Newts.
- Hazel dormouse.
- Reptiles.
- Badgers.
- Breeding Birds.

- Barn Owls.
- Otter.
- Water Vole.
- Invertebrates.

S.5 These species / species groups have been subject to detailed surveys and are all reported within each relevant appendix within Chapter 10 Ecology and Nature Conservation of the M4CaN ES.

1 Introduction

1.1.1 RPS has undertaken a Phase 1 habitat survey of the route of the proposed M4 Corridor around Newport (M4CaN) between Castleton and Magor to inform the ecological baseline for environmental impact assessment (EIA) of the Scheme. The survey included land generally within 250 metres of the proposed alignment following the methodology set out in the Guidelines for Preliminary Ecological Appraisal (CIEEM, 2012) and the Handbook for Phase 1 Habitat Survey (JNCC, 2010). The EIA is reported in the M4CaN Environmental Statement (ES) of which this document is an appendix to the chapter on Ecology and Nature Conservation.

1.1.2 An Extended Phase 1 habitat survey previously undertaken by Arup on behalf of Welsh Government in 2014 is reported separately in Appendix 10.2 of the M4CaN ES. A review of that work was undertaken independently by Hyder (see Appendix 9.1 in the ES Scoping Report (ES Appendix 5.1)) and RPS (see ES Chapter 10). The conclusions of that review and the requirements for additional surveys in 2015 were set out in the Scope of Ecology Surveys Report (see Appendix 9.1 of the ES Scoping Report). This was discussed with Natural Resources Wales and they were further consulted on the scope of the proposed surveys through the consultation on the ES Scoping Report. The resulting areas selected for surveying in 2015 included all areas within 250 m of the proposed alignment of the new section of motorway that were not surveyed by Arup in 2014.

1.1.3 This document reports the findings of the additional Phase 1 habitat survey, which was undertaken from May to September 2015 using standard Chartered Institute of Ecology and Environmental Management (CIEEM) and Joint Nature Conservation Committee (JNCC) methods.

1.1.4 This report document outlines the previous survey carried out and the reasons for this additional survey (Section 2), describes the methods used in the survey (Section 3) and the findings of the survey (Section 4). A discussion of the survey findings is provided in Section 5.

2 Previous Surveys

2.1 Introduction

2.1.1 The 2014 Arup Extended Phase 1 habitat survey is reported in ES Appendix 10.2.

2.1.2 In addition to the Phase 1 habitat survey, the 2014 report includes an ecology desk study and a Habitat Suitability Index assessment of waterbodies to determine their suitability to support great created newt (*Triturus cristatus*). A search for invasive plant species was also carried out.

2.1.3 During 2014, some areas within the study area were inaccessible to survey either due to a lack of ownership information or refusal to allow access by land owners or occupiers.

2.2 2014 Survey Method

Ecology Desk Study

2.2.1 A biodiversity information search was commissioned from the local biological records centre, South East Wales Biological Records Centre (SEWBReC), to inform and support the survey methodology. This included a request for records of bats up to 5 km; other legally protected and priority species within 2 km; and species of conservation concern within 1 km of the study area.

2.2.2 The location of statutory designated sites for nature conservation within the vicinity of the study area was established using Geographic Information System (GIS) layers provided by Natural Resources Wales (NRW) (formerly the Countryside Council for Wales) and the JNCC.

2.2.3 A search radius of 10 km from the study area was used for European Sites, including Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Wetlands of International Importance (Ramsar sites). Nationally designated Sites of Special Scientific Interest (SSSIs) were identified within 2 km of the study area. Local designations (primarily Sites of Importance for Nature Conservation (SINC), but including Local Nature Reserves (LNR) where information was available), were identified within 1 km from information provided by SEWBReC.

2.2.4 The results of previous surveys undertaken by Arup in 2007/8 were also reviewed as part of the ecology desk study exercise and are included within the 2014 report.

2014 Extended Phase 1 Habitat Survey

2.2.5 The objectives of the 2014 Extended Phase 1 habitat survey were as follows.

- Identify and map the broad habitat types present within the study area.
- Record signs of legally protected species and non-native invasive plant species.
- Assess the suitability of the habitats within the study area to support legally protected and otherwise notable species.

2.2.6 The survey methodology followed the 'extended Phase 1' methodology as set out in the Guidelines for Baseline Ecological Assessment (IEA, 1995). This method of survey provides information on the habitats in the survey area and the potential for legally protected species to occur on or adjacent to the site. The survey was carried out within the optimum survey window, which extends from March to October. It was considered that reliable habitat classifications had been made.

2.2.7 The habitats were classified according to their vegetation types and presented in the standard Phase 1 habitat survey format (JNCC, 2010). Target Notes (TNs) were used to record species composition and to identify areas of particular interest, including the potential for protected species to be present.

2.2.8 In addition, data from a limited Phase 1 survey undertaken from roads and public rights of way in 2013 were used to augment the Phase 1 habitat survey maps produced in the report where access was limited. The 2013 surveys were reported within the DMRB Stage 2 Environmental Report (Welsh Government, 2014).

Great Crested Newt Habitat Suitability Index

2.2.9 Waterbodies that could be accessed within the study area were subject to a Habitat Suitability Index (HSI) appraisal, according to the methods described in Oldham *et al*. (2000) to assess their potential to support great crested newts.

2.2.10 The standard methodology has been designed to evaluate habitat quality and quantity in order to assess which ponds provide suitable habitat for great crested newt breeding (ARGUK, 2010).

2.2.11 The reens (water filled drainage ditches) within the Gwent Levels were also included within the scope of the HSI assessments. However, due to the nature of these waterbodies, the calculation of HSI was adapted to discount the area, density and waterfowl indices. This approach was agreed with NRW in the 'M4 Corridor around Newport – Ecological Survey Consultation' letter dated 7 February 2014 and email response from Jessica Poole (NRW Team Leader) dated 3 March 2014. These were discounted as the ratio of bank to water area is much greater in linear ditches than in ponds. As a result, the impacts of waterfowl on bankside vegetation are also considerably less. Pond density was discounted as the reens form part of a connected drainage network and this index would be high for all waterbodies within Levels area.

Invasive Plant Species

2.2.12 A search was also made for evidence of the presence of legally controlled invasive plant species within and immediately adjacent to the site. The target species were invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), which include the following species.

- Japanese knotweed (*Fallopia japonica*).
- Himalayan balsam (*Impatiens glandulifera*).
- Giant hogweed (*Heracleum mantegazzianum*).
- Montbretia (*Crocosmia x crocosmifolia*).
- Various cotoneaster species (*Cotoneaster* spp.).

- New Zealand pygmyweed (*Crassula helmsii*).
- Nuttall's waterweed (*Elodea nuttallii*).

2.3 Requirements for Further Survey

2.3.1 Arup advised that, as access was not possible to all parts of the study area, it was recommended that any gaps be surveyed in 2015.

2.3.2 Arup also advised that further surveys were also likely to be required for the following species/species groups subject to consultation with NRW.

- Further great crested newt surveys.
- Barn owl (*Tyto alba*) surveys.
- Bat emergence surveys.

2.3.3 RPS considered the recommendations for further ecological surveys made in the reports of the surveys carried out by Arup in 2014, the discussions between Hyder and NRW at a meeting on 30 January 2015, and subsequent discussions with Arup, Hyder and NRW.

2.3.4 On the basis of these considerations, RPS proposed that further desk study and Phase 1 habitat survey should be undertaken to inform the EIA process. This included the following.

- Review of additional Associated British Ports (ABP) and NRW invertebrate survey reports for Newport Docks and the Gwent Levels, respectively.
- Additional Extended Phase 1 habitat survey of those areas within 250 m of the proposed alignment of the new section of motorway not previously accessible to Arup, and additional areas not previously considered.
- Further records of invasive plant species within the survey areas.

3 2015 Survey Methods

3.1 2015 Desk Study

3.1.1 A search area around the proposed new section of motorway between Junctions 23 to 29 and a second search area around the existing M4 corridor between the same junctions (where the Complementary Measures are proposed to be implemented) were used when requesting records of designated sites and protected and notable species, as described in Appendix 10.17 of the ES.

3.2 2015 Phase 1 Habitat Survey Methodology

3.2.1 The Phase 1 habitat survey was carried out over the period May to September 2015, which falls within the optimum period for this type of survey.

3.2.2 The survey area was based upon the proposed alignment of the new section of motorway, within areas not previously surveyed by Arup, together with an approximate 250 m corridor to either side. The extent of the survey area is shown on Figure 1.

3.2.3 The survey method was based on that described in the Handbook for Phase 1 Habitat Survey (JNCC, 2010) and the Guidelines for Preliminary Ecological Appraisal (CIEEM, 2012).

3.2.4 Site surveys were undertaken over the period May to September 2015, during which the habitats within the survey areas were classified and mapped according to the JNCC habitat categories.

3.2.5 Target Notes were taken where appropriate to provide further detail on habitat structure and floristic composition, or habitat suitability to support legally protected species.

3.2.6 In addition, searches were made for invasive non-native plant species focussing on those currently listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended in 2010).

3.3 Limitations

3.3.1 Due to difficulties acquiring land access for surveys, some areas of land were surveyed at a distance with the aid of binoculars. This includes small sections at Target Notes 3, 8, 58, 59 and 168.

3.3.2 The landfill to the west of Newport Docks has not been surveyed as it was not possible to access this area and the area was considered too complex to survey from a distance.

3.3.3 The limitations to land access were minimal, with the majority of Phase 1 habitat mapping completed without restriction. Given the nature of the survey the constraints are unlikely to have affected the accuracy of the results.

4 Results

4.1 Introduction

4.1.1 The results of the desk study are provided in Appendix 10.17 and Confidential Appendix 10.36 of the ES. The results of the Phase 1 habitat survey are provided below, with reference to Target Notes, which are provided in Annex A of this report and which are illustrated on the Phase 1 habitat map (Figure 2).

4.1.2 In the following section, discrete habitat types are named in accordance with the classifications provided in JNCC (2010). The alpha-numeric codes provided also relate to the system of classification used in the JNCC guidance.

4.2 2015 Phase 1 Habitat Survey

Woodland (A1)

4.2.1 Areas of woodland are relatively infrequent across the surveyed areas, typically comprising small, discrete units of broadleaved semi-natural woodland (A1.1.1) and broadleaved planation woodland (A1.1.2).

4.2.2 At the western section, three areas of semi-natural woodland lie within the land parcels (Target Notes 1, 21 and 26). The areas at Target Notes 1 and 26 are similar in structure, each with a small stream flowing through them and comprising semi-mature hazel (*Corylus avellana*), ash (*Fraxinus excelsior*) and willows (*Salix* spp.). Ground flora includes woodland species such as bluebell (*Hyacinthoides non-scripta*), wood avens (*Geum urbanum*) and lesser celandine (*Ranunculus ficaria*). The third section at Target Note 21 has a ground flora containing wood avens, foxglove (*Digitalis purpurea*) and hart's-tongue fern (*Asplenium scolopendrium*) and supports some mature ash trees surrounded by younger plantation.

4.2.3 At the eastern section of the new section of motorway, parcels of semi-natural woodland are present to the north of Magor, Undy and Rogiet.

4.2.4 Broadleaved plantation woodland is located mostly within the western and eastern sections of surveyed land parcels, along existing road verges. These areas typically include abundant ash, hawthorn (*Crataegus monogyna*) and bramble (*Rubus fruticosus*), with sycamore (*Acer pseudoplatanus*), hazel and elder (*Sambucus nigra*) less frequently present. In some areas a more diverse understorey has developed (Target Note 6), while elsewhere it is dominated by species-poor rough grassland and bramble scrub (Target Note 45).

Scrub (A2) and Hedgerows (J2)

4.2.5 Dense (A2.1) and scattered scrub (A2.2) was noted within the areas surveyed. This habitat type typically comprised bramble, hawthorn and buddleia (*Buddleja davidii*). Occasionally recorded scrub species were blackthorn (*Prunus spinosa*), dog rose *(Rosa canina*), willow, gorse (*Ulex europaeus*) and silver birch (*Betula pendula*).

4.2.6 Notably extensive stretches of dense and scattered scrub are present on disused land at Newport Docks.

4.2.7 Hedgerows typically border the fields surveyed along the route of the new section of motorway and an assortment of hedgerow types were recorded. Species-rich intact hedgerows (J2.1.1), species-rich defunct hedgerows (J2.2.1) and species-rich hedgerows with trees (J2.3.1) were often recorded, many of which were categorised as Important Hedgerows under the Hedgerow Regulations 1995, as detailed in Appendix 10.21 of the ES.

4.2.8 Intact species-poor hedgerows (J2.1.2), defunct species-poor hedgerows (J2.2.2) and species-poor hedgerows with trees (J2.3.2) were recorded throughout the survey area, and typically comprised hawthorn, bramble or willow.

Improved Grassland (B4), Arable Land (J1.1) and Amenity Grassland (J1.2)

4.2.9 Areas of improved grassland are frequent throughout the route of the new section of motorway and comprise many of the surveyed fields along the eastern section. Many of the surveyed fields are used as grazing pasture.

4.2.10 Arable land is present to a small extent principally around Castleton to the west of the new section of motorway and around Magor and Rogiet to the east. To the west, arable land is located at Gwaunshonbrown Farm to the north of the existing M4, and The Stud Farm, Maerdy Farm and several nearby fields to the south of the A48. To the east, arable fields are present to the north west of Magor and to the north of Rogiet.

4.2.11 Amenity grassland comprises a minimal amount of habitat within the surveyed areas and is generally associated with residential areas.

Semi-improved Neutral Grassland (B2.2) and Poor Semi-improved Grassland (B6)

4.2.12 Semi-improved neutral grassland and poor semi-improved grassland comprise a large proportion of land within the survey boundaries.

4.2.13 Grasses commonly occurring within these areas included bent grasses (*Agrostis* spp.), Yorkshire fog (*Holcus lanatus)*, meadow foxtail (*Alopecurus pratensis*), crested dog's-tail (*Cynosurus cristatus*), sweet vernal grass (*Anthoxanthum odoratum*), cock's-foot (*Dactylis glomerata*), Timothy (*Phleum pratense*) and false oat-grass (*Arrhenatherum elatius*).

4.2.14 Typical forbs found within the sward include red clover (*Trifolium pratense*) and white clover (*Trifolium repens*), black knapweed (*Centaurea nigra*), meadow buttercup (*Ranunculus acris*), yarrow (*Achillea millefolium*), red campion (*Silene dioica*), ox-eye daisy (*Leucanthemum vulgare*), common ragwort (*Jacobaea vulgaris*), perforate St. John's-wort (*Hypericum perforatum*) and meadow vetchling (*Lathyrus pratensis*).

4.2.15 A summary of the species rich semi-improved grassland within the survey areas is provided in Table 4.1 below.

Table 4.1: Summary of Species Richness of Semi-improved Grassland

Species Richness	Area	Target Notes	Description
High	Gwent Levels – fields south of Picked Lane	96	Species rich grassland with frequent sweet vernal grass, occasional common sorrel, false fox sedge, black knapweed, Yorkshire fog and meadow buttercup. Yellow rattle was locally abundant.
Moderate-high	TATA Steelworks	See Appendix 10.4 National Vegetation Classification Survey	Man-made habitat with varied alkaline substrata including ruderal flora, flower-rich damp grasslands and extensive reedbeds, with good numbers of notable species.
Moderate-high	Magor – fields east of St. Brides Road	124, 128	Grassland comprising perennial rye grass, meadow foxtail, cocksfoot and crested dog's tail, and a diverse forb assemblage. Forbs present include lesser stitchwort, red campion, common mouse-ear, meadow vetchling, meadow buttercup and common knapweed.
Moderate-high	Llandevenny – Barecroft fields and Barecroft common SINC	111-113 , also see Appendix 10.17 Desk Study Data	Damp, uncut, semi-improved grassland supporting indicator species such as crested dog's tail, common knapweed and sheep's sorrel. While much of the field is relatively species-poor there are localised patches of uncommon species including meadow rue, tubular water-dropwort and ragged robin.
Moderate-high	Fields around Castleton	9, 20, also see Appendix 10.4 National Vegetation Classification Survey	Fields and road verge with long sward dominated by Yorkshire fog, creeping bent and teasel. Ox-eye daisy and meadow buttercup are prominent, with other frequent species including Bird's-foot Trefoil, Meadow Vetchling, Red Clover, Self-heal, Common Knapweed and Lady's Bedstraw. Common Spotted Orchid is present at a very low frequency. The grassland habitat includes several locally notable plant species: stone parsley, grass vetchling and yellow-wort.

Marshy Grassland (B5) and Grazing Marsh

4.2.16 Fields within the Gwent Levels section of the new section of motorway form a part of an extensive area of low-lying marsh extending southwards to the Severn Estuary. These fields are typically bordered by reens and wet ditches, and occasionally support species indicative of wetter conditions such as cuckooflower (*Cardamine pratensis*) and soft rush (*Juncus effusus*) (Target Note 103).

4.2.17 Within the surveyed land parcels, fields of marshy grassland are present between Magor and Newport within the Gwent Levels Nash and Goldcliff and Whitson SSSIs.

4.2.18 A number of the surveyed fields were dominated by soft rush with a border of drier grassland with species such as crested dog's tail, sheep's sorrel (*Rumex acetosella*) and black knapweed.

4.2.19 A summary of the species rich marshy grassland within the survey areas is provided below in Table 4.2.

Table 4.2: Summary of Species Richness of Semi-improved Grassland

Species Richness	Area	Target Notes	Description
High	ABP Docks	85, also see Appendix 10.4 National Vegetation Classification Survey	Patches of rush within a mosaic of un-improved grassland and short ephemeral vegetation. Uncommon species recorded include round-headed club-rush, saltmarsh rush and sea club-rush.
Moderate-high	Llandevenny - Bowkett field SINC	111-113, also see Appendix 10.17 Desk Study Data	Tall marshy grassland with localised overgrown willow scrub and interesting herb species.

Waterbodies and Ditches (G1)

4.2.20 Reens and field ditches (G1) are a major aspect of the Gwent Levels SSSIs and are known to contain a suite of rare and scarce invertebrate and plant species.

4.2.21 Two woodland streams were recorded at the western section of the new section of motorway, at Target Notes 1 and 26. Both streams are relatively small with stony beds with no associated aquatic flora.

Other Habitats – ABP Newport Docks

4.2.22 The area surveyed within Newport Docks is a brownfield site. The majority of habitats within the site comprise a mosaic of species-rich short ephemeral/perennial vegetation (J1.3) and unimproved regenerating grassland, which has established on Made Ground comprised of a variety of substrates, resulting in a varied vegetation type. The grassland supports a diverse forb assemblage growing on a widely varying substrate, further described in Appendix 10.20 of the ES.

4.2.23 Saltmarsh (H2.6) and reedbeds (F1) border the River Ebbw to the west of the docks. These habitats are also described in Appendix 10.20 of the ES. Other habitats present within Newport Docks included areas of dense buddleia scrub, patches of common reed (*Phragmites australis*), marshy grassland and tall ruderal vegetation that form a mosaic of habitats interspersed with the unimproved regenerating grassland described above.

Invasive Plants

4.2.24 Japanese knotweed, Himalayan balsam and *Cotoneaster horizontalis* were recorded at various locations during the survey. Additionally three aquatic invasive species were recorded. These were Canadian Pondweed (*Elodea Canadensis),* least duckweed (*Lemna minuta*) and Nuttall's pondweed (*Elodea nuttallii*). The locations of invasive species recorded during the 2015 surveys are shown on Figure 3.

Potential for Protected Species

Bats

4.2.25 There is extensive suitable foraging habitat for bats (woodland, scrub, grassland and hedgerows) along the route of the new section of motorway.

4.2.26 Trees with potential roost features were identified at Target Notes 11, 15, 16, 34, 43 and 133. As trees at Target Notes 11 and 16 are located over 100 m from the route, no further survey was considered necessary. Trees at Target Note 133 were classified as having low potential and further survey was not considered necessary.

4.2.27 It is recommended that pre-construction surveys are undertaken on trees at Target Notes 15, 34 and 43.

4.2.28 A small, roofless, stone building covered in dense ivy and surrounded by dense scrub at Target Note 31 was recorded as having low potential for bats to roost in small crevices on the walls.

4.2.29 Two buildings with potential to support roosting bats were identified at Target Note 134, to the north of Undy.

4.2.30 As these buildings lie over 100 m from the route further survey was not considered necessary.

4.2.31 Appendix 10.7 (2014 bat survey), Appendix 10.23 (bat activity survey 2015) and Appendix 10.24 (bat roost survey 2015) of the ES provide further details of the use of land by bats.

Otter and Water Vole

4.2.32 There is potential for otters (*Lutra lutra*) and water voles (*Arvicola amphibius*) to be present along the wet ditches and reens throughout the Gwent Levels sections of the route of the new section of motorway, and also along the Rivers Usk and Ebbw.

4.2.33 Suitable water vole habitat was recorded at Target Notes 54, 57, 60, 98, 111, 112, 129 and 146.

4.2.34 The use of habitat along the route of the new section of motorway by otters and water voles is further discussed in Appendix 10.8 (2014 otter and water vole survey) and Appendix 10.25 (2015 otter and water vole survey) of this ES.

Dormouse

4.2.35 Habitat potentially suitable for dormouse (*Muscardinus avellanarius*) is present along the length of the proposed new section of motorway, in the form of woodland, dense scrub and hedgerows.

4.2.36 Within the land parcels where Phase 1 surveys were undertaken, suitable habitat was more abundant at the western and eastern sections of the route, where dense scrub and woodland is more prevalent.

4.2.37 Target Notes 1, 2, 6, 8, 10, 18, 21, 23-27, 32, 33, 45 and 49 highlight habitat suitable for dormouse to the west of the route. Target Notes 135, 136, 142, 151 and 155 highlight suitable habitat to the east of the route.

4.2.38 Dormouse surveys were undertaken by Arup in 2014 at Target Notes 2, 18, 21, 23, 27 and 142 (see Appendix 10.9) and by RPS at Target Notes 1, 6, 8, 10, 25, 26, 32, 33, 45, 49, 151 and 155 in 2015 (see Appendix 10.26). Target Note 24 lies outside of the 250 m survey buffer zone.

4.2.39 It is recommended that further surveys are undertaken at Target Notes 135 and 136.

4.2.40 The presence of dormouse along the route of the new section of motorway is further discussed in Appendix 10.9 (2015 dormouse survey) and Appendix 10.26 (2015 dormouse survey).

Reptiles

4.2.41 The grazing marsh with its reens and ditches throughout the Gwent Levels section of the new section of motorway provides suitable habitat for grass snake (*Natrix natrix*). Other common reptiles are likely to be associated with mosaic habitats where open areas suitable for basking are interspersed with taller vegetation affording shelter.

4.2.42 The varied habitat at Alexandra Docks provides an extensive area of suitable reptile habitat within the Phase 1 survey areas, and a rock pile offering suitable hibernacula was discussed in Target Note 63.

4.2.43 To the north of Rogiet, adders (*Vipera berus*) are known to be present within a Gwent Wildlife Trust site known as Rogiet Poor Land (Target Note 151).

4.2.44 Suitable habitat for reptiles was additionally noted at Target Notes 9, 17, 20, 30, 37, 39, 90, 101, 124, and 128.

4.2.45 The 2015 reptile survey report (Appendix 10.27 of the ES) provides details of surveys undertaken at Newport Docks and land south of Tata Steelworks and Appendix 10.11 (2014 reptile survey report) describes other areas surveyed for reptiles.

Badgers

4.2.46 It is evident that badgers (*Meles meles*) are present within the new section of motorway and both signs of presence and a sett were found during the Phase 1 survey.

4.2.47 Mammal paths characteristic of badgers were found at Target Notes 8, 13, 29 and 47 between Castleton and Coedkernew. Two additional paths were found at Target Note 117, to the west of Magor.

4.2.48 A badger sett was recorded at the eastern section of the new section of motorway. There was also anecdotal evidence of a badger sett and areas with potential for badger setts (that could not be accessed due to dense vegetation).

4.2.49 Badger surveys have been undertaken along the route of the proposed new section of motorway and are described in Confidential Appendix 10.37 and Confidential Appendix 10.38.

Breeding Birds

4.2.50 Abundant suitable nesting habitat for a variety of bird species is present across the surveyed area. Further discussion of the species likely to use the habitat surrounding the new section of motorway is provided in Appendix 10.13 (2014 breeding bird survey) and Appendix 10.28 (2015 breeding bird and breeding wader survey).

4.2.51 Three incidental records of active nesting sites were made during the Phase 1 surveys. The first record, at Alexandra Docks, was of sand martins (*Riparia riparia*) nesting within a large pile of pumice sand (Target Note 86). At Target Note 56, jackdaws (*Coloeus monedula*) were recorded nesting within a tree cavity. The third noted nest was of a pair of house martins (*Delichon urbicum*) nesting on the side of a house near Castleton, at Target Note 41. Habitat suitable for nesting lapwings was recorded at Target Note 59, to the south east of Coedkernew.

Barn Owls

4.2.52 Suitable habitat for barn owls is present across the surveyed area. Barn owls were sighted on the Gwent Levels during bat roosting surveys at Pye Corner Farm and Tatton Farm. A targeted survey for barn owls was undertaken in 2015, the results of which are provided in Appendix 10.29 of the ES.

Great Crested Newts

4.2.53 Reens and wet ditch field boundaries are frequent within the landscape along the proposed route of the new section of motorway to the east of Duffryn and provide suitable great crested newt habitat. Suitable terrestrial habitat is also abundant within the wider landscape.

4.2.54 In addition to the many reens and wet ditches, a drainage basin which may be used by great crested newts was recorded at Target Note 130 to the north of Magor.

4.2.55 Presence of great crested newts within the land surrounding the new section of motorway is further discussed in Appendix 10.6 (2014 great crested newt presence/absence surveys) and Appendix 10.22 (2015 great crested newt survey) of the ES.

Invertebrates

4.2.56 Habitats and areas with the potential for a diverse assemblage of invertebrates were noted during the survey. The invertebrate populations are described in Appendix 10.15 (2014 invertebrate survey) and Appendix 10.31 (2015 terrestrial invertebrate survey) of the ES.

5 Discussion

5.1.1 This report presents the findings of a Phase 1 habitat survey of the route of the proposed new section of motorway south of Newport.

5.1.2 The survey area was based upon the proposed alignment of the new section of motorway, within areas not previously surveyed by Arup, together with an approximate 250 m corridor to either side. The extent of the survey area is shown on Figure 1.

5.1.3 Habitats identified within the 2015 survey area are described in this report. In addition to this, reens and fields ditches within the Gwent Levels SSSIs have been described in other ecological reports produced for Chapter 10 Ecology and Nature Conservation of the M4CaN ES (i.e. the 2015 River Corridor Survey Appendix 10.32 and the 2015 Aquatic Macrophyte Survey Report Appendix 10.30). The habitats identified during the 2015 Phase 1 habitat survey included the following.

- Semi-natural woodland and broadleaved plantation woodland (A1).
- Scrub (A2).
- Hedgerows (J2).
- Improved Grassland (B4).
- Arable Land (J1.1).
- Amenity Grassland (J1.2).
- Semi-improved Neutral Grassland (B2.2).
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- Reedbeds (F1).
- Invasive plants.

5.1.4 Semi improved grassland with notable diversity was identified during the survey, including the following.

- Fields south of Picked Lane within the Gwent Levels (high diversity).
- Tata Steelworks (moderate to high diversity).
- Magor – fields east of St. Brides Road (moderate to high diversity).
- Llandevenny –Barecroft fields and Barecroft common SINC (moderate to high diversity).
- Fields around Castleton (moderate to high diversity).

5.1.5 Marshy grassland with notable species diversity was identified during the survey, including the following.

- ABP Newport Docks (high species diversity).
- Llandevenny - Bowkett field SINC (moderate to high diversity).

5.1.6 Habitat suitable for the following protected species was also noted during the survey.

- Bats.
- Great Crested Newts.
- Hazel dormouse.
- Reptiles.
- Badgers.
- Breeding Birds.
- Barn Owls.
- Otter.
- Water Vole.
- Invertebrates.

These species/species groups have been subject to detailed surveys and are all reported within each relevant appendix to Chapter 10 of the M4CaN ES.

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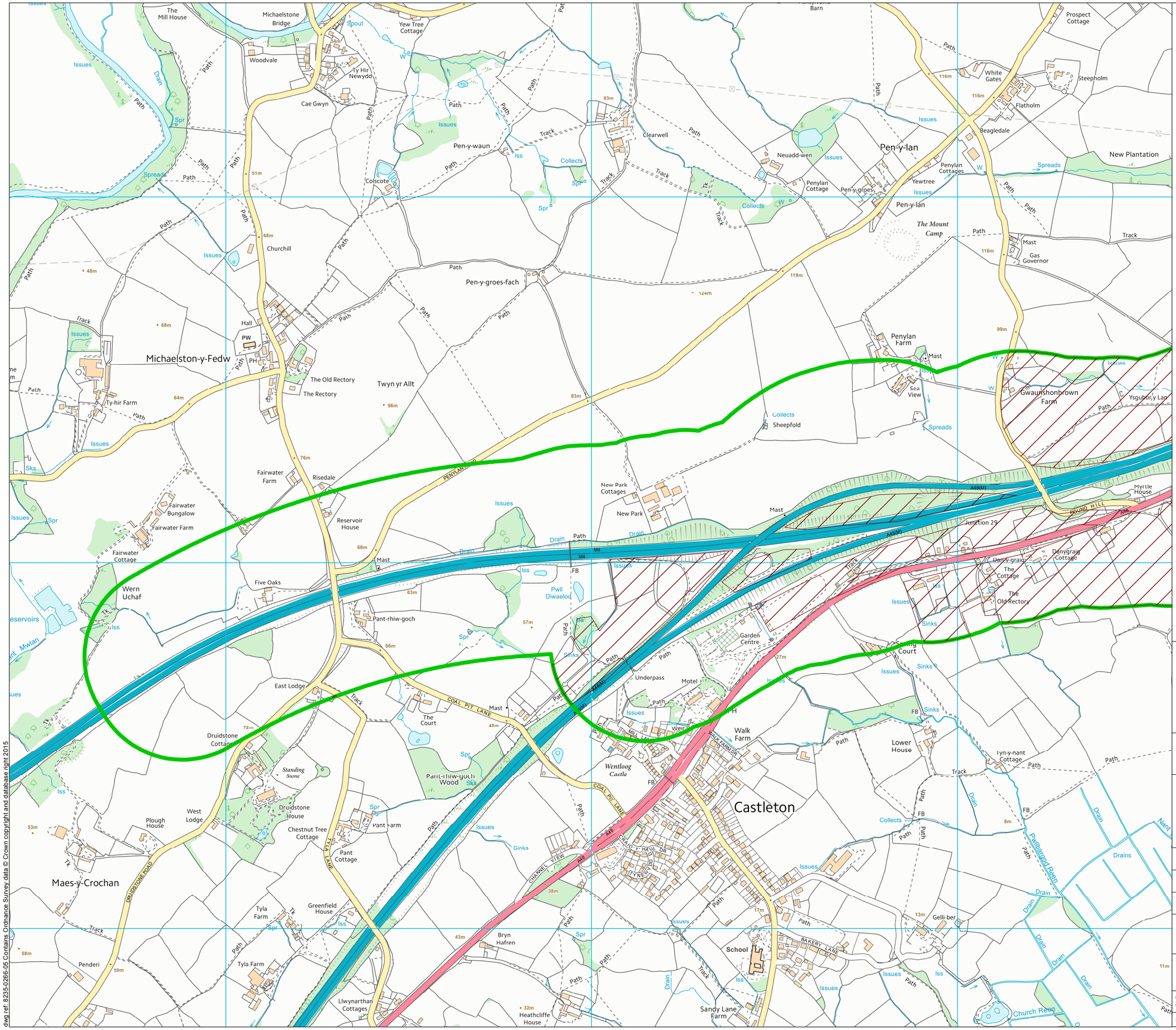
Figures



Legend

▨ 2015 Survey Areas

🟩 250m Study Area

Study area shown reflects the scheme design at the time of the survey

Llywodraeth Cymru
Welsh Government

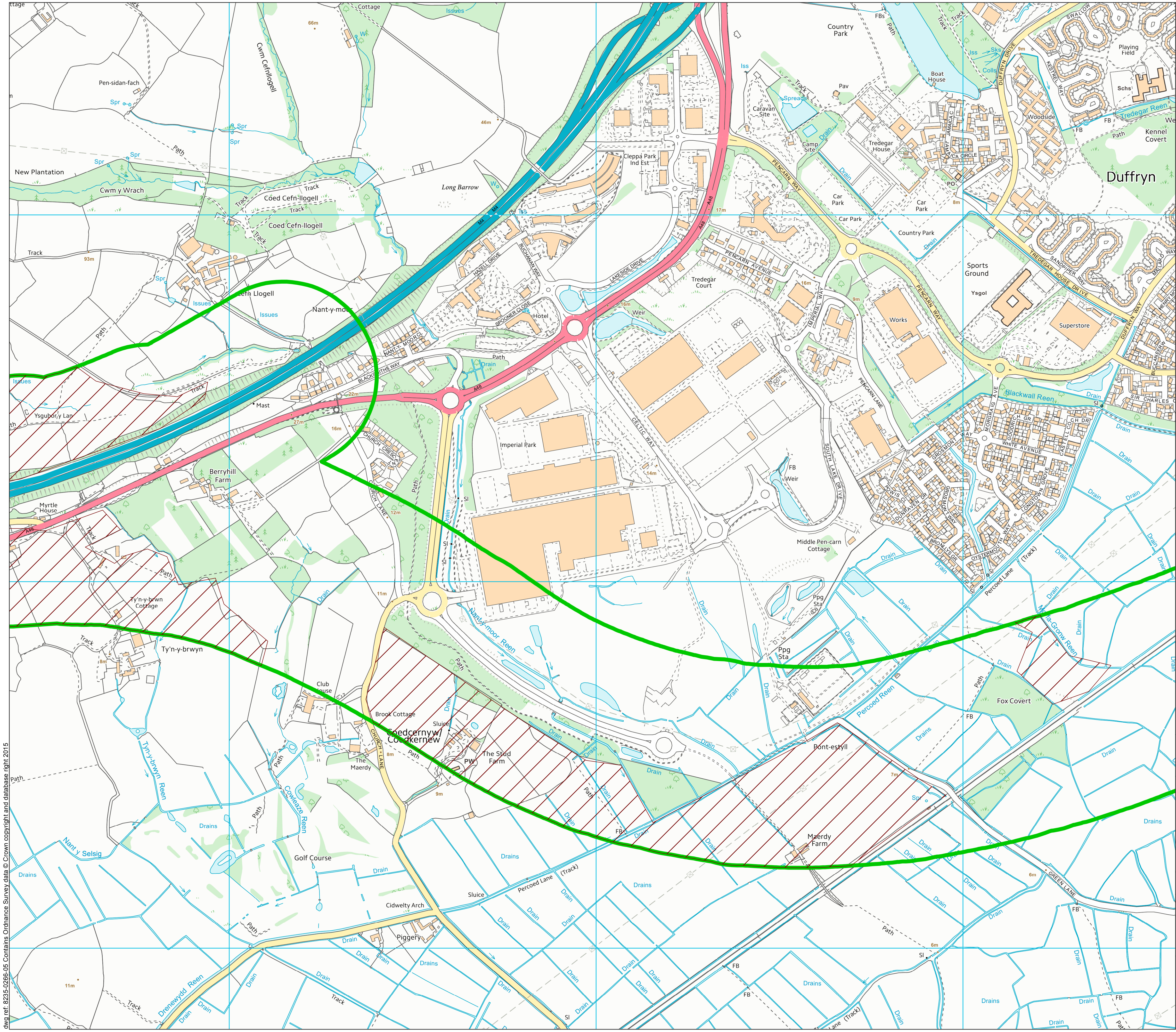
Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Survey Area

Figure: 1a	Revision:
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000
0 250 500m
N

dwg ref: 8235-0266-05



Legend

2015 Survey Areas

250m Study Area

Study area shown reflects the scheme design at the time of the survey

Llywodraeth Cymru
Welsh Government

Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Survey Area

Figure: 1b	Revision:
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000

0 250 500m

N

dwg ref: 8235-0266-05

Legend

- 2015 Survey Areas
- 250m Study Area

Study area shown reflects the scheme design at the time of the survey

Llywodraeth Cymru
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Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Survey Area

Figure: 1c	Revision:
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000

0 250 500m

N

dwg ref: 8235-0266-05

Legend

- 2015 Survey Areas
- 250m Study Area

Study area shown reflects the scheme design at the time of the survey

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Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Survey Area

Figure: 1d	Revision:
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000

0 250 500m

N

dwg ref: 8235-0266-05

Legend

- 2015 Survey Areas
- 250m Study Area

Study area shown reflects the scheme design at the time of the survey

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Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Survey Area

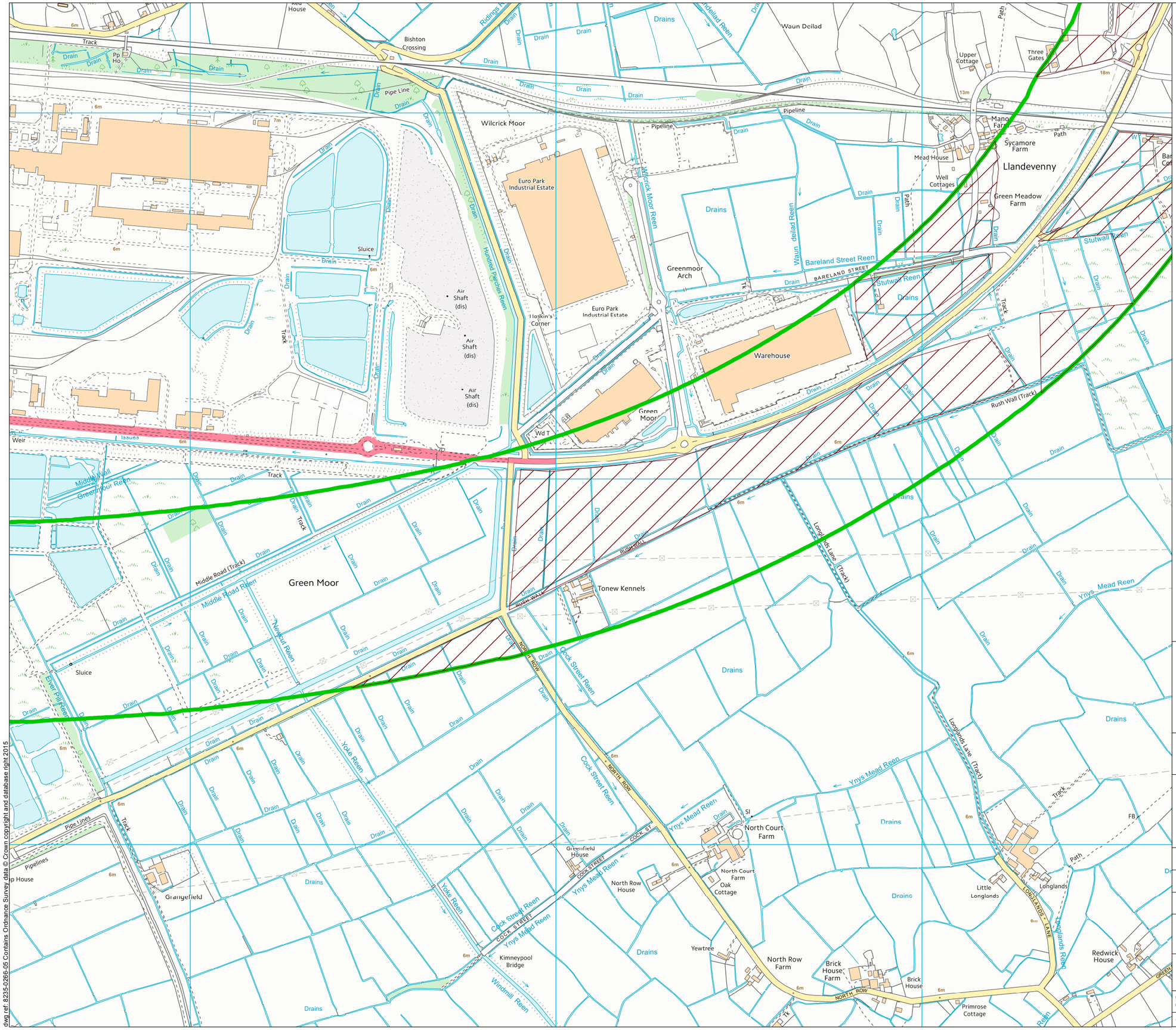
Figure: 1e	Revision:
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000

0 250 500m

N

dwg ref: 8235-0266-05



Legend

- 2015 Survey Areas
- 250m Study Area

Study area shown reflects the scheme design at the time of the survey

Llywodraeth Cymru
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Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Survey Area

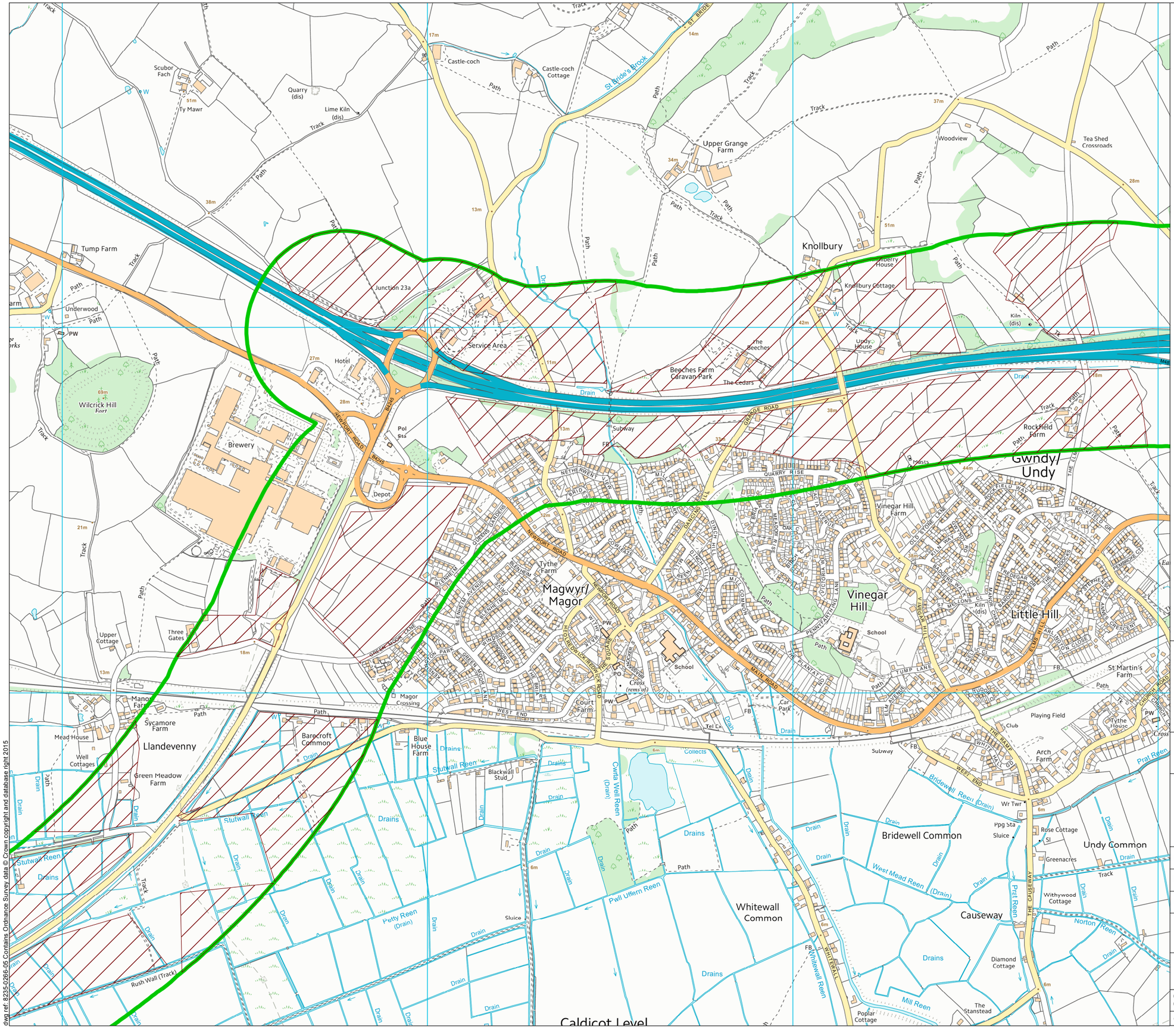
Figure: 1f	Revision:
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000

0 250 500m

N

dwg ref: 8235-0266-05



Legend

- 2015 Survey Areas
- 250m Study Area

Study area shown reflects the scheme design at the time of the survey

Llywodraeth Cymru
Welsh Government

Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Survey Area

Figure: 1g	Revision:
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000

0 250 500m

N

dwg ref: 8235-0266-05

Legend

- 2015 Survey Areas
- 250m Study Area

Study area shown reflects the scheme design at the time of the survey

Llywodraeth Cymru
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Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Survey Area

Figure: 1h	Revision:
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000

0 250 500m

N

dwg ref: 8235-0266-05

Legend

250m Study area
2015 Survey Areas

Target note
Tree
Scrub

Watercourse
Species-rich intact hedge
Species-poor intact hedge
Species-rich defunct hedge
Species poor defunct hedge with fence
Species-rich hedge with trees
Species-poor hedge with trees
Fence
Wall
Dry ditch
Boundary removed
Earth bank

Unimproved neutral grassland
Caravan site
Introduced shrub
Scattered saltmarsh
Broad leaved semi-natural Woodland
Broad leaved plantation Woodland
Coniferous plantation woodland
Mixed semi-natural Woodland
Mixed plantation Woodland
Scrub dense continuous
Scrub scattered
Broadleaved plantation woodland
Mixed parkland
SI *Semi-improved Neutral grassland*
I *Improved grassland*
Marsh/marshy grassland
SI *Poor semi-improved grassland*
Tall ruderal
Swamp
Inundation vegetation
Marginal vegetation
Standing water
Intertidal mud/sand
Saltmarsh dense/continuous
Hardstanding
A *Arable*
A *Amenity grassland*
Ephemeral/short perennial
Building
Bare Ground
Other habitat
Orchard
No access
Allotment

Note: 2015 survey area includes Peter Sturgess 2015 NVC survey area.
Study area shown reflects the scheme design at the time of the survey.

Llywodraeth Cymru
Welsh Government

Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Phase 1 Habitat Plan

Figure: 2a	Revision:
Date: MARCH 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000
0 200 400m

N

dwg ref: 8235-0378-04

Legend

- 250m Study area
- 2015 Survey Areas
- Target note
- Tree
- Scrub
- Watercourse
- Species-rich intact hedge
- Species-poor intact hedge
- Species-rich defunct hedge
- Species poor defunct hedge with fence
- Species-rich hedge with trees
- Species-poor hedge with trees
- Fence
- Wall
- Dry ditch
- Boundary removed
- Earth bank
- Unimproved neutral grassland
- Caravan site
- Introduced shrub
- Scattered saltmarsh
- Broad leaved semi-natural Woodland
- Broad leaved plantation Woodland
- Coniferous plantation woodland
- Mixed semi-natural Woodland
- Mixed plantation Woodland
- Scrub dense continuous
- Scrub scattered
- Broadleaved plantation woodland
- Mixed parkland
- SI Semi-improved Neutral grassland
- I Improved grassland
- Marsh/marshy grassland
- SI Poor semi-improved grassland
- Tall ruderal
- Swamp
- Inundation vegetation
- Marginal vegetation
- Standing water
- Intertidal mud/sand
- Saltmarsh dense/continuous
- Hardstanding
- A Arable
- A Amenity grassland
- Ephemeral/short perennial
- Building
- Bare Ground
- Other habitat
- Orchard
- No access
- Allotment

Note: 2015 survey area includes Peter Sturgess 2015 NVC survey area. Study area shown reflects the scheme design at the time of the survey.

Llywodraeth Cymru
Welsh Government

Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Phase 1 Habitat Plan

Figure: 2b	Revision:
Date: MARCH 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000

0 200 400m

N

dwg ref: 8235-0378-04

Legend

- 250m Study area
- 2015 Survey Areas
- Target note
- Tree
- Scrub
- *Watercourse*
- *Species-rich intact hedge*
- *Species-poor intact hedge*
- *Species-rich defunct hedge*
- *Species poor defunct hedge with fence*
- *Species-rich hedge with trees*
- *Species-poor hedge with trees*
- *Fence*
- *Wall*
- *Dry ditch*
- *Boundary removed*
- *Earth bank*
- *Unimproved neutral grassland*
- *Caravan site*
- *Introduced shrub*
- *Scattered saltmarsh*
- *Broad leaved semi-natural Woodland*
- *Broad leaved plantation Woodland*
- *Coniferous plantation woodland*
- *Mixed semi-natural Woodland*
- *Mixed plantation Woodland*
- *Scrub dense continuous*
- *Scrub scattered*
- *Broadleaved plantation woodland*
- *Mixed parkland*
- SI *Semi-improved Neutral grassland*
- I *Improved grassland*
- *Marsh/marshy grassland*
- SI *Poor semi-improved grassland*
- *Tall ruderal*
- *Swamp*
- *Inundation vegetation*
- *Marginal vegetation*
- *Standing water*
- *Intertidal mud/sand*
- *Saltmarsh dense/continuous*
- *Hardstanding*
- A *Arable*
- A *Amenity grassland*
- *Ephemeral/short perennial*
- *Building*
- *Bare Ground*
- *Other habitat*
- *Orchard*
- *No access*
- *Allotment*

Note: 2015 survey area includes Peter Sturgess 2015 NVC survey area. Study area shown reflects the scheme design at the time of the survey.

Llywodraeth Cymru
Welsh Government

Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Phase 1 Habitat Plan

Figure: 2c	Revision:
Date: MARCH 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000
0 200 400m

N

dwg ref: 8235-0378-04

Legend

- 250m Study area
- 2015 Survey Areas
- Target note
- Tree
- Scrub
- *Watercourse*
- *Species-rich intact hedge*
- *Species-poor intact hedge*
- *Species-rich defunct hedge*
- *Species poor defunct hedge with fence*
- *Species-rich hedge with trees*
- *Species-poor hedge with trees*
- *Fence*
- *Wall*
- *Dry ditch*
- *Boundary removed*
- *Earth bank*
- *Unimproved neutral grassland*
- *Caravan site*
- *Introduced shrub*
- *Scattered saltmarsh*
- *Broad leaved semi-natural Woodland*
- *Broad leaved plantation Woodland*
- *Coniferous plantation woodland*
- *Mixed semi-natural Woodland*
- *Mixed plantation Woodland*
- *Scrub dense continuous*
- *Scrub scattered*
- *Broadleaved plantation woodland*
- *Mixed parkland*
- SI *Semi-improved Neutral grassland*
- I *Improved grassland*
- *Marsh/marshy grassland*
- SI *Poor semi-improved grassland*
- *Tall ruderal*
- *Swamp*
- *Inundation vegetation*
- *Marginal vegetation*
- *Standing water*
- *Intertidal mud/sand*
- *Saltmarsh dense/continuous*
- *Hardstanding*
- A *Arable*
- A *Amenity grassland*
- *Ephemeral/short perennial*
- *Building*
- *Bare Ground*
- *Other habitat*
- *Orchard*
- *No access*
- *Allotment*

Note: 2015 survey area includes Peter Sturgess 2015 NVC survey area. Study area shown reflects the scheme design at the time of the survey.

Llywodraeth Cymru
Welsh Government

Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Phase 1 Habitat Plan

Figure: 2d	Revision:
Date: MARCH 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000
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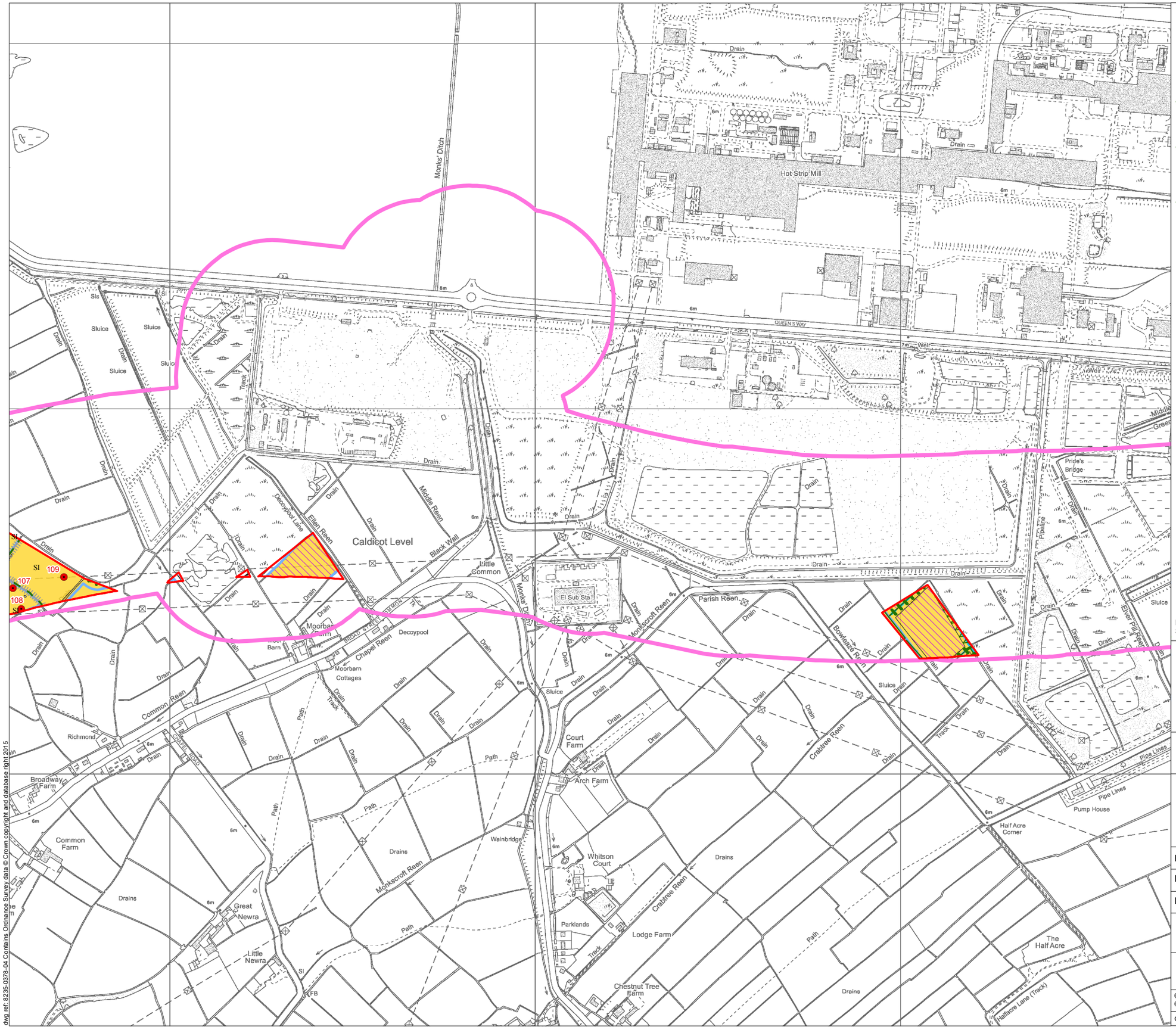

Legend

- 250m Study area
- 2015 Survey Areas
- Target note
- Tree
- Scrub
- *Watercourse*
- *Species-rich intact hedge*
- *Species-poor intact hedge*
- *Species-rich defunct hedge*
- *Species poor defunct hedge with fence*
- *Species-rich hedge with trees*
- *Species-poor hedge with trees*
- *Fence*
- *Wall*
- *Dry ditch*
- *Boundary removed*
- *Earth bank*
- *Unimproved neutral grassland*
- *Caravan site*
- *Introduced shrub*
- *Scattered saltmarsh*
- *Broad leaved semi-natural Woodland*
- *Broad leaved plantation Woodland*
- *Coniferous plantation woodland*
- *Mixed semi-natural Woodland*
- *Mixed plantation Woodland*
- *Scrub dense continuous*
- *Scrub scattered*
- *Broadleaved plantation woodland*
- *Mixed parkland*
- SI *Semi-improved Neutral grassland*
- I *Improved grassland*
- *Marsh/marshy grassland*
- SI *Poor semi-improved grassland*
- *Tall ruderal*
- *Swamp*
- *Inundation vegetation*
- *Marginal vegetation*
- *Standing water*
- *Intertidal mud/sand*
- *Saltmarsh dense/continuous*
- *Hardstanding*
- A *Arable*
- A *Amenity grassland*
- *Ephemeral/short perennial*
- *Building*
- *Bare Ground*
- *Other habitat*
- *Orchard*
- *No access*
- *Allotment*

Note: 2015 survey area includes Peter Sturgess 2015 NVC survey area. Study area shown reflects the scheme design at the time of the survey.

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Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Phase 1 Habitat Plan

Figure: 2e	Revision:
Date: MARCH 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000
0 200 400m

N

dwg ref: 8235-0378-04

Legend

- 250m Study area
- 2015 Survey Areas
- Target note
- Tree
- Scrub
- Watercourse
- Species-rich intact hedge
- Species-poor intact hedge
- Species-rich defunct hedge
- Species poor defunct hedge with fence
- Species-rich hedge with trees
- Species-poor hedge with trees
- Fence
- Wall
- Dry ditch
- Boundary removed
- Earth bank

- Unimproved neutral grassland
- Caravan site
- Introduced shrub
- Scattered saltmarsh
- Broad leaved semi-natural Woodland
- Broad leaved plantation Woodland
- Coniferous plantation woodland
- Mixed semi-natural Woodland
- Mixed plantation Woodland
- Scrub dense continuous
- Scrub scattered
- Broadleaved plantation woodland
- Mixed parkland
- SI Semi-improved Neutral grassland
- I Improved grassland
- Marsh/marshy grassland
- SI Poor semi-improved grassland
- Tall ruderal
- Swamp
- Inundation vegetation
- Marginal vegetation
- Standing water
- Intertidal mud/sand
- Saltmarsh dense/continuous
- Hardstanding
- A Arable
- A Amenity grassland
- Ephemeral/short perennial
- Building
- Bare Ground
- Other habitat
- Orchard
- No access
- Allotment

Note: 2015 survey area includes Peter Sturgess 2015 NVC survey area. Study area shown reflects the scheme design at the time of the survey.

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Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Phase 1 Habitat Plan

Figure: 2f	Revision:
Date: MARCH 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000
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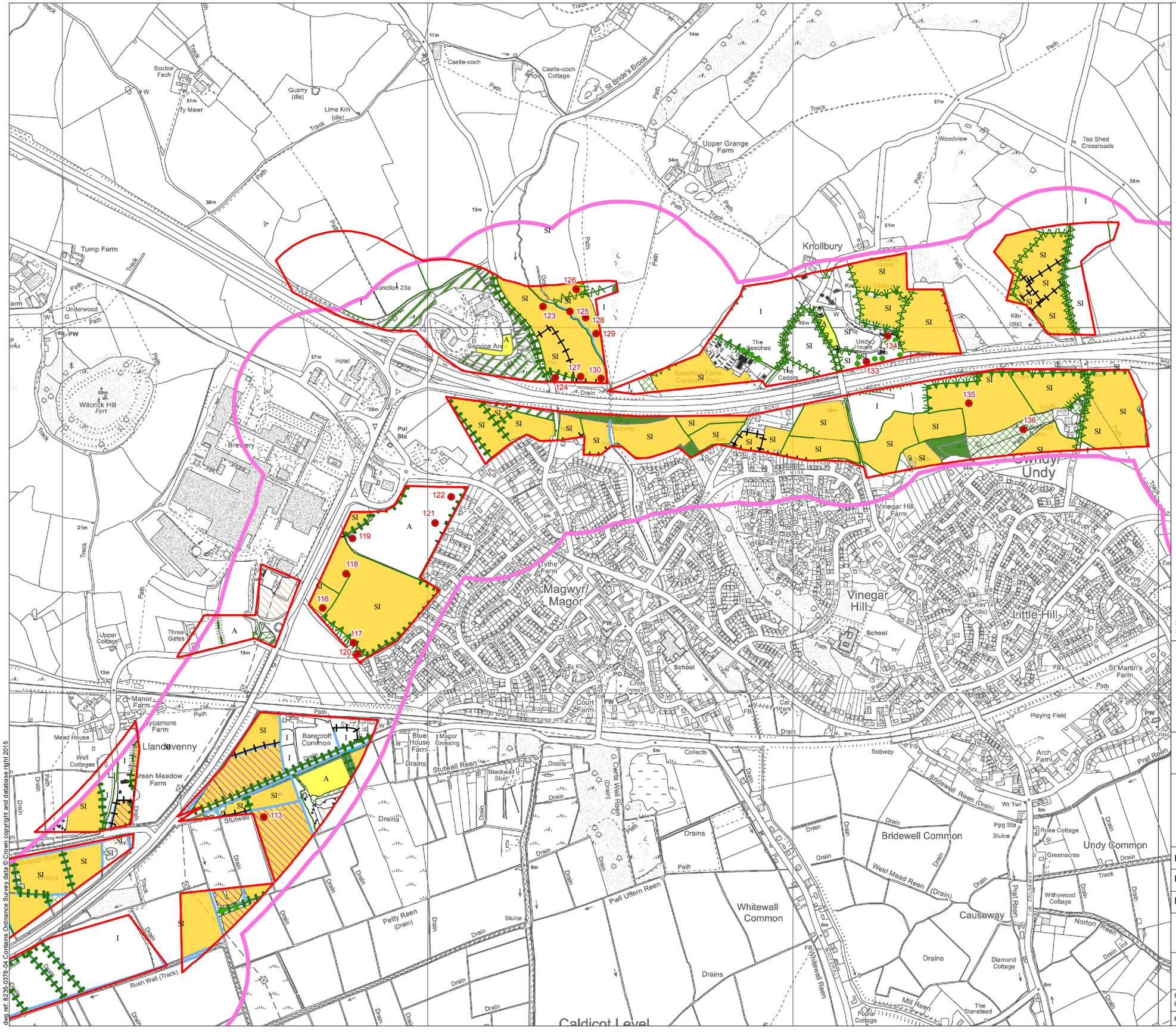

Legend

- ▭ 250m Study area
- ▭ 2015 Survey Areas
- ● Target note
- ● Tree
- × Scrub
- Watercourse
- Species-rich intact hedge
- Species-poor intact hedge
- Species-rich defunct hedge
- Species poor defunct hedge with fence
- Species-rich hedge with trees
- Species-poor hedge with trees
- Fence
- Wall
- Dry ditch
- Boundary removed
- Earth bank
- 🟨 Unimproved neutral grassland
- ▦ Caravan site
- ▨ Introduced shrub
- ▭ Scattered saltmarsh
- 🟩 Broad leaved semi-natural Woodland
- ▨ Broad leaved plantation Woodland
- ▨ Coniferous plantation woodland
- ▩ Mixed semi-natural Woodland
- ▨ Mixed plantation Woodland
- ▦ Scrub dense continuous
- ▭ Scrub scattered
- ▩ Broadleaved plantation woodland
- ▩ Mixed parkland
- SI Semi-improved Neutral grassland
- I Improved grassland
- ▨ Marsh/marshy grassland
- SI Poor semi-improved grassland
- ▨ Tall ruderal
- ▭ Swamp
- ▨ Inundation vegetation
- ▨ Marginal vegetation
- ▭ Standing water
- ▩ Intertidal mud/sand
- ▭ Saltmarsh dense/continuous
- ▭ Hardstanding
- A Arable
- A Amenity grassland
- ×× Ephemeral/short perennial
- ■ Building
- ▩ Bare Ground
- ▭ Other habitat
- + Orchard
- ▨ No access
- ▭ Allotment

Note: 2015 survey area includes Peter Sturgess 2015 NVC survey area.
Study area shown reflects the scheme design at the time of the survey.

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Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Phase 1 Habitat Plan

Figure: 2g	Revision:
Date: MARCH 2016	Status: AT ISSUE
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Scale: A3 @ 1:10,000
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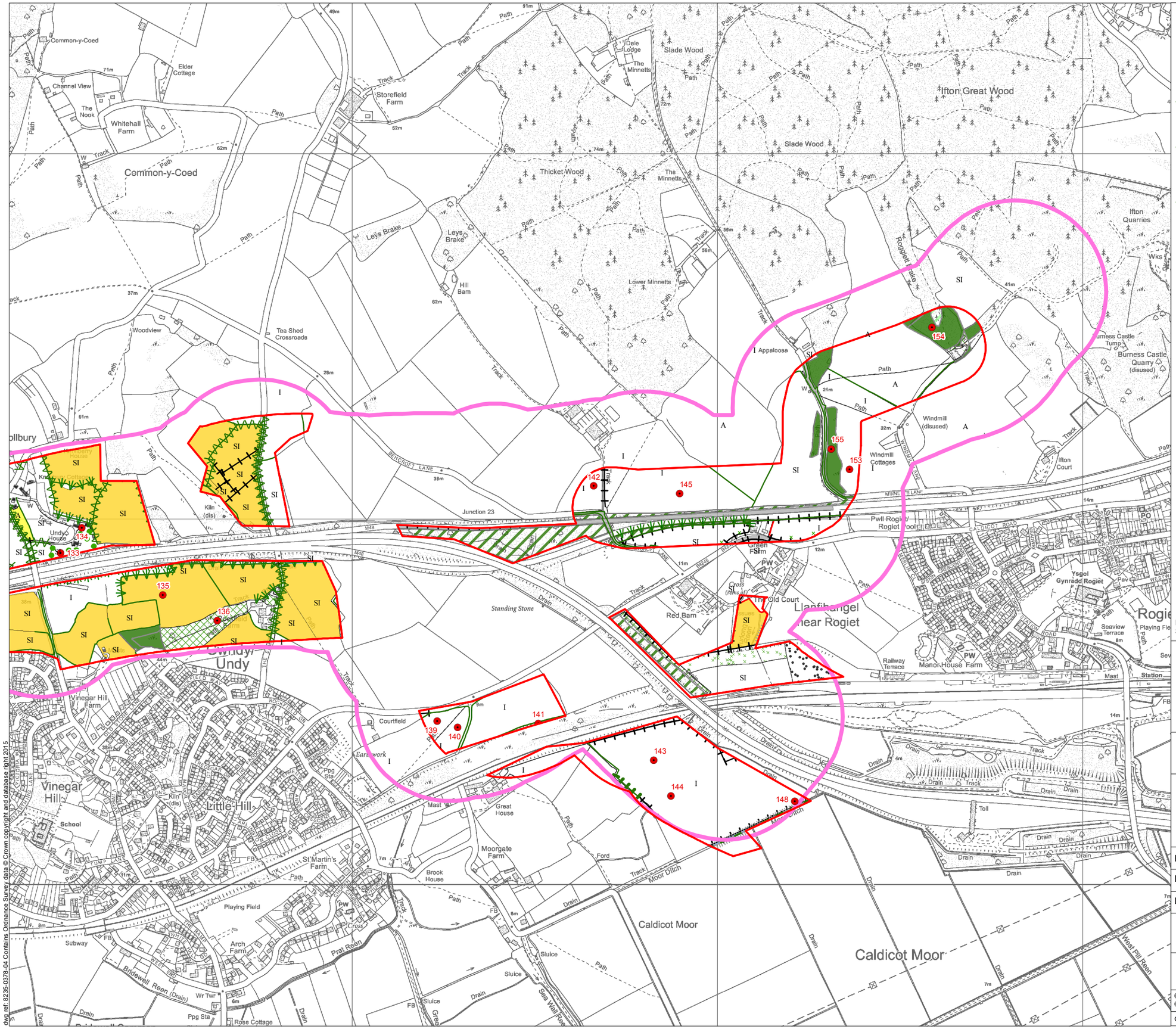

Legend

250m Study area
2015 Survey Areas
Target note
Tree
Scrub
Watercourse
Species-rich intact hedge
Species-poor intact hedge
Species-rich defunct hedge
Species poor defunct hedge with fence
Species-rich hedge with trees
Species-poor hedge with trees
Fence
Wall
Dry ditch
Boundary removed
Earth bank

Unimproved neutral grassland
Caravan site
Introduced shrub
Scattered saltmarsh
Broad leaved semi-natural Woodland
Broad leaved plantation Woodland
Coniferous plantation woodland
Mixed semi-natural Woodland
Mixed plantation Woodland
Scrub dense continuous
Scrub scattered
Broadleaved plantation woodland
Mixed parkland
SI *Semi-improved Neutral grassland*
I *Improved grassland*
Marsh/marshy grassland
SI *Poor semi-improved grassland*
Tall ruderal
Swamp
Inundation vegetation
Marginal vegetation
Standing water
Intertidal mud/sand
Saltmarsh dense/continuous
Hardstanding
A *Arable*
A *Amenity grassland*
Ephemeral/short perennial
Building
Bare Ground
Other habitat
Orchard
No access
Allotment

Note: 2015 survey area includes Peter Sturgess 2015 NVC survey area. Study area shown reflects the scheme design at the time of the survey.

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Welsh Government

Appendix 10.19 Phase 1 Habitat Survey 2015

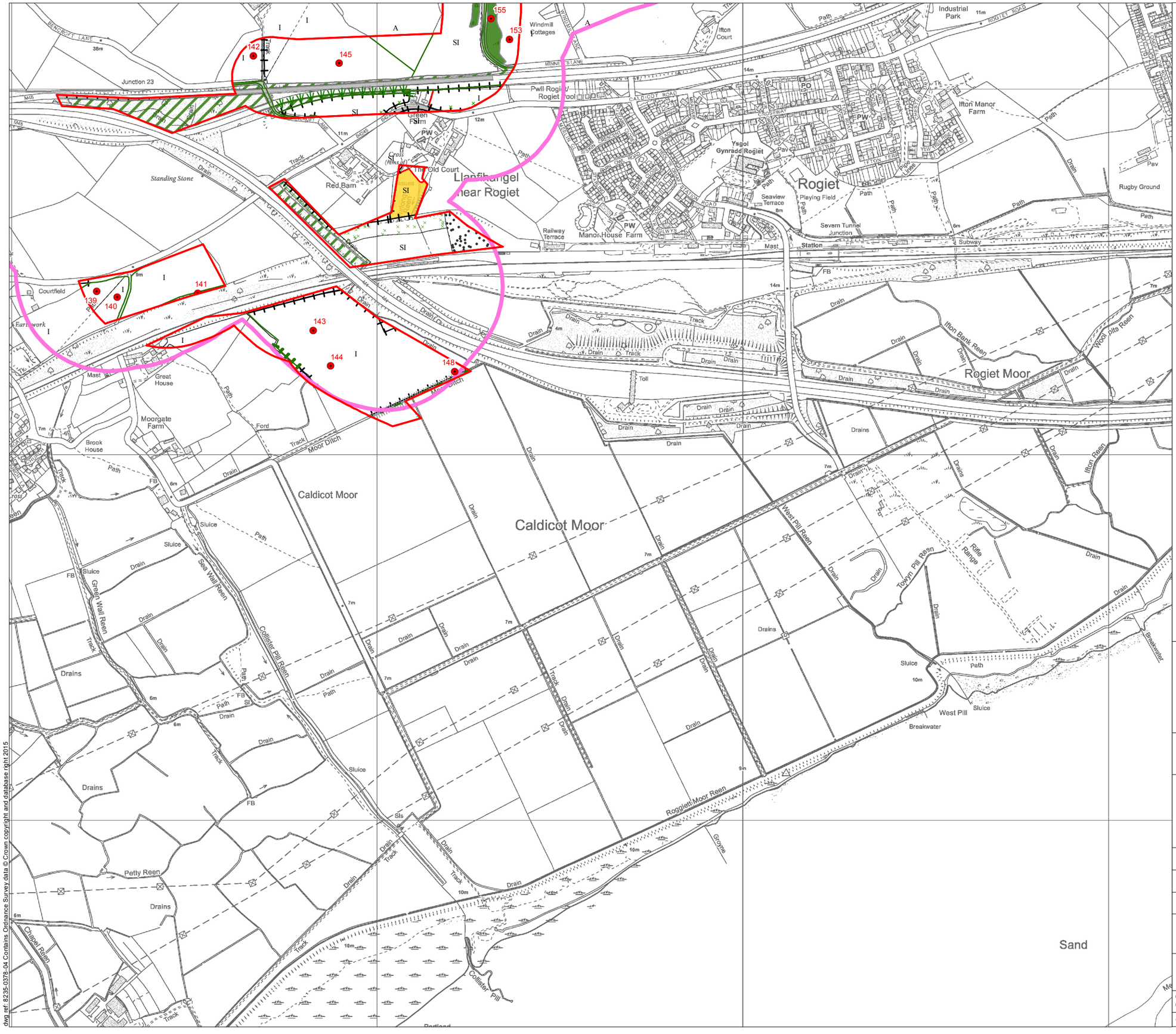
2015 Phase 1 Habitat Plan

Figure: 2h	Revision:
Date: MARCH 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000
0 200 400m

N

dwg ref: 8235-0378-04



Legend

- 250m Study area
- 2015 Survey Areas
- Target note
- Tree
- Scrub
- Watercourse
- Species-rich intact hedge
- Species-poor intact hedge
- Species-rich defunct hedge
- Species poor defunct hedge with fence
- Species-rich hedge with trees
- Species-poor hedge with trees
- Fence
- Wall
- Dry ditch
- Boundary removed
- Earth bank
- Unimproved neutral grassland
- Caravan site
- Introduced shrub
- Scattered saltmarsh
- Broad leaved semi-natural Woodland
- Broad leaved plantation Woodland
- Coniferous plantation woodland
- Mixed semi-natural Woodland
- Mixed plantation Woodland
- Scrub dense continuous
- Scrub scattered
- Broadleaved plantation woodland
- Mixed parkland
- Semi-improved Neutral grassland (SI)
- Improved grassland (I)
- Marsh/marshy grassland
- Poor semi-improved grassland (SI)
- Tall ruderal
- Swamp
- Inundation vegetation
- Marginal vegetation
- Standing water
- Intertidal mud/sand
- Saltmarsh dense/continuous
- Hardstanding
- Arable (A)
- Amenity grassland (A)
- Ephemeral/short perennial
- Building
- Bare Ground
- Other habitat
- Orchard
- No access
- Allotment

Note: 2015 survey area includes Peter Sturgess 2015 NVC survey area. Study area shown reflects the scheme design at the time of the survey.

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Appendix 10.19 Phase 1 Habitat Survey 2015

2015 Phase 1 Habitat Plan

Figure: 2i	Revision:
Date: MARCH 2016	Status: AT ISSUE
Drawn: MS	Checked: JW

Scale: A3 @ 1:10,000
0 200 400m

N

dwg ref: 8235-0378-04

Legend

- 2015 Survey Areas
- 100m Study area
- 250m Study area

Plants

- Canadian pondweed
- Cotoneaster
- Himalayan balsam
- Japanese knotweed
- Least Duckweed
- Nuttall's waterweed

Study area shown reflects the scheme design at the time of the survey

Llywodraeth Cymru
Welsh Government

Appendix 10.19 Phase 1 habitat survey

2015 Invasive Species Plan

Figure: 3a	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked: KJ

Scale: A3 @ 1:15,000

0 250 500m

N

dwg ref: 8235-0495-02

Legend

- 2015 Survey Areas
- 100m Study area
- 250m Study area

Plants

- Canadian pondweed
- Cotoneaster
- Himalayan balsam
- Japanese knotweed
- Least Duckweed
- Nuttall's waterweed

Study area shown reflects the scheme design at the time of the survey

Llywodraeth Cymru
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Appendix 10.19 Phase 1 habitat survey

2015 Invasive Species Plan

Figure: 3b	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked: KJ

Scale: A3 @ 1:15,000
0 250 500m

N

dwg ref: 8235-0495-02

Legend

- 2015 Survey Areas
- 100m Study area
- 250m Study area

Plants

- Canadian pondweed
- Cotoneaster
- Himalayan balsam
- Japanese knotweed
- Least Duckweed
- Nuttall's waterweed

Study area shown reflects the scheme design at the time of the survey

Llywodraeth Cymru
Welsh Government

Appendix 10.19 Phase 1 habitat survey

2015 Invasive Species Plan

Figure: 3c	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked: KJ

Scale: A3 @ 1:15,000
0 250 500m

N

dwg ref: 8235-0495-02

Legend

- 2015 Survey Areas
- 100m Study area
- 250m Study area

Plants

- Canadian pondweed
- Cotoneaster
- Himalayan balsam
- Japanese knotweed
- Least Duckweed
- Nuttall's waterweed

Study area shown reflects the scheme design at the time of the survey

Llywodraeth Cymru
Welsh Government

Appendix 10.19 Phase 1 habitat survey

2015 Invasive Species Plan

Figure: 3d	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked: KJ

Scale: A3 @ 1:15,000

0 250 500 m

N

dwg ref: 8235-0495-02

Legend

- 2015 Survey Areas
- 100m Study area
- 250m Study area

Plants

- Canadian pondweed
- Cotoneaster
- Himalayan balsam
- Japanese knotweed
- Least Duckweed
- Nuttall's waterweed

Study area shown reflects the scheme design at the time of the survey

Llywodraeth Cymru
Welsh Government

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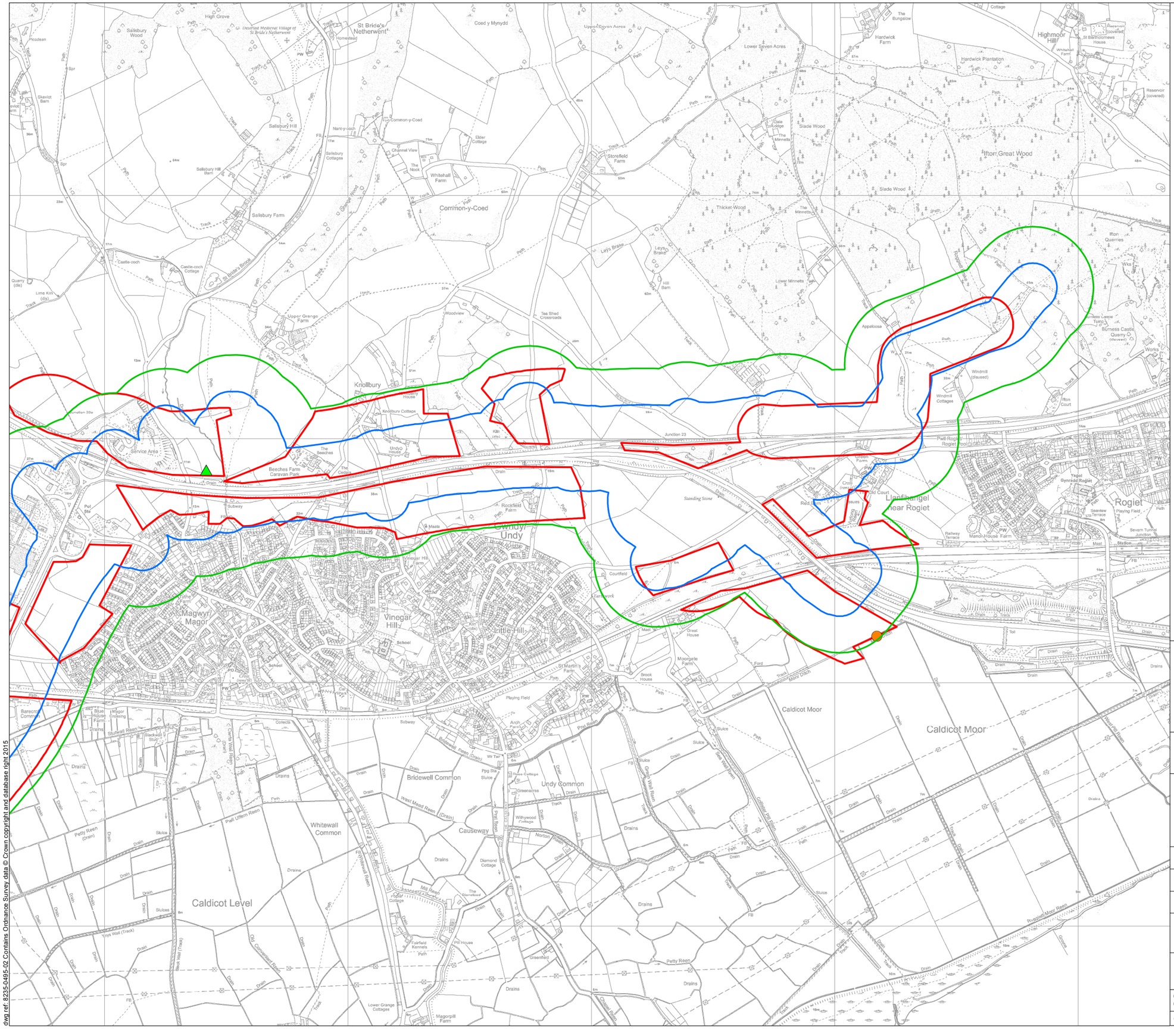
Figure: 3e	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MS	Checked: KJ

Scale: A3 @ 1:15,000
0 250 500 m

N

dwg ref: 8235-0495-02



dwg ref: 8235-0495-02 Contains Ordnance Survey data © Crown copyright and database right 2015

Legend

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N

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Annexes

Annex A: Target Notes

The following target notes comprise details recorded on-site by surveyors during the 2015 Phase 1 surveys. The locations of target notes are provided on Figure 2.

General Notes on Protected Species

Nesting Birds: Dense scrub and woodland is a frequent habitat type along the surveyed areas, and throughout provides suitable habitat for nesting birds unless otherwise stated

Great crested newt and Water vole: Reens and field ditches throughout the surveyed areas are considered as having potential to support water voles, otters and great crested newts unless otherwise stated.

Otter: this species is known to be widespread within location of the proposed new alignment of the M4, consequently, unless otherwise stated main rivers, reens and field ditches are considered to provide suitable habitat.

Target Note	Note
1	Open semi-natural broad-leaved woodland with mature trees. Species include hazel, alder, hawthorn, holly, elder, oak, willow. Ground flora species include wood avens, bluebell, bramble, red campion, forget me not, buttercup, dandelion, wild parsley, silverweed, common nettle, common dog violet, lesser celandine. Small rocky stream surrounds woodland with flowing water and little aquatic vegetation. Potential for dormouse.
2	Broadleaved plantation woodland within road verges. Mixture of young and semi mature trees. Mainly consists of ash with some hazel, white poplar, hawthorn, willow, sycamore. Ground flora includes willowherb, bracken, common nettle and dominated by cocksfoot. Potential for dormouse, breeding birds and foraging bats.
3	NO ACCESS. Needs checking to ascertain if semi-improved or improved grassland.
4	As at target note 2
5	Dry attenuation pond within central reservation area between motorways. With hazel and field maple saplings, some reeds, dominated by willowherb. Grassland includes common knapweed - consistent with neutral grassland species. Potential breeding birds. Limited potential for amphibians as dry.
6	Semi natural broadleaved woodland – with some additional plantation. Species include sycamore, hazel, horse chestnut, alder, gorse, guelder rose, beech, oak, willow, elder, field maple, ivy. Understory species include bramble, cleavers, dandelion, ribwort plantain, herb Robert, common vetch, ox eye daisy, buttercup, forget me not, red campion, lords and ladies, cocksfoot, birds foot trefoil, willowherb, dock. Potential for dormouse, breeding birds and foraging bats.
7	Not Used
8	Mammal path characteristic of badger into dense bramble and bracken.

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Target Note	Note
9	Semi-improved neutral grassland with abundant black knapweed, creeping bent, sweet vernal grass, Yorkshire fog, meadow buttercup and common ragwort. Scattered hawthorn trees and bramble at centre of grassland. Bordered by dense bramble, with blackthorn also present to the east. Woody nightshade, lesser stitchwort and common centuary, present along scrub edge. High quality reptile habitat.
10	Species-poor hedgerow comprised mostly of hawthorn and ash. Potential to be used by nesting birds and good connectivity to surrounding area provides potential to be used by dormice.
11	Small patch of trees (hawthorn, silver birch, and a mature ash). The ash has a hollow trunk forming a large cavity, the extent of which was not fully visible and may be suitable for roosting bats.
12	Stone wall borders the field with sparse but sprawling bramble and semi-mature ash trees along the roadside. Limited potential for birds to be nesting in trees.
13	Mammal path through tall semi-improved grassland and into the bramble scrub, characteristic of badger.
14	Mostly sycamore hedgerow with some ash, silver birch, hawthorn, blackthorn and laurel bordering a garden. Further north are larger trees including semi-mature sycamores, conifer, holly and ash. The hedgerow has poor connectivity to the surrounding landscape but offers suitable habitat for nesting birds.
15	Mature ash with split up trunk forming large cavity, potential to be used by roosting bats
16	Three mature English oak trees, with several rot holes offering potential bat roosting features
17	Semi-improved grassland, species such as Yorkshire fog and false oat-grass abundant. Potential for reptiles.
18	Broad-leaved plantation woodland comprising mostly immature trees (ash and hazel) with occasional semi-mature and mature ash trees. Potential for dormice to be present given the connectivity to know populations within woodland and hedgerows within the surrounding area.
19	Small strip of semi-improved neutral grassland along roadside, comprising creeping bent, sweet vernal grass, Yorkshire fog, false oat-grass and black knapweed.
20	A field of semi-improved neutral grassland reaching 1m in height and dominated by creeping bent with abundant knapweed. Sweet vernal grass, Yorkshire fog

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Target Note	Note
	and false oat-grass are additionally present within the sward. High quality reptile habitat.
21	Broad-leaved plantation woodland with immature and sapling trees (ash, hawthorn, holly, English oak, beech, field maple, hazel) though a ground flora containing older woodland species such as hartstongue fern, foxglove, wood avens. Ivy, white bryony, bramble sprawling and climbing throughout this woodland add structure. Nettle, yarrow, ribwort plantain also present. Potential for dormice to be present given the connectivity to surrounding habitat.
22	Poor semi-improved grassland with a sward height of 15cm maximum, species present include creeping bent, crested dog's tail, Yorkshire fog, teasel, sweet vernal grass.
23	Sprawling, dense bramble scrub at the centre of the woodland, with potential to be used by dormice.
24	Fairly diverse intact hedgerow, all tree species young/small. Potential for dormice to be present given the connectivity to surrounding habitat.
25	Semi-mature plantation woodland with high potential for dormouse due to connectivity to a known population of this species
26	Semi-mature woodland containing hazel, ash and willow, dormouse potential due to the level of connectivity to other woodland and hedgerows in the surrounding area.
27	Intact hedgerow to south mostly bramble and hawthorn (rarely white bryony, dog's mercury, elder), whereas northern and western boundaries of field more diverse and taller. Potential for dormice to be present given the connectivity to surrounding habitat.
28	Large mature oak tree in the centre of arable land
29	Mammal path through grass into hedgerow, not recently formed though width characteristic of badger. Other similar paths found in adjacent fields to the west (target notes 8 and 13).
30	Sward to 30cm comprising perennial ryegrass, white clover, selfheal, ribwort plantain, dandelion, black medic, Yorkshire fog, common mouse-ear, creeping buttercup, red clover, nettle, broad-leaved dock, yarrow, hogweed, red campion, cocksfoot, common field speedwell, creeping cinquefoil, false oat-grass, knapweed, barren strawberry, sedge. Potential to be used by reptiles. Small storage sheds in field with simple roof structure, negligible potential for use by bats. Ivy-leaved toadflax, barren brome and lords-and-ladies are present

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Target Note	Note
	around the storage sheds.
31	Old stone building with no roof, low potential for bats to roost amongst dense ivy growing on walls. Dense scrub surrounds the building.
32	Bramble dominated scrub with small ash trees and hawthorn. Trees fairly sparse but there is potential for dormice to be present amongst the bramble given the connectivity to surrounding habitat.
33	Large, intact, species-rich hedgerows either side of small road, both 2 - 3 m in width. Species present in both include bramble, ash, hawthorn, hartstongue, barren brome, rose sp., holly, field maple and blackthorn. Two large English oak trees are additionally present in the western hedgerow. Potential for dormice to be present given the connectivity to surrounding habitat.
34	Mature oak with many cavities in the centre of the hedgerow has bat roost potential.
35	Wide bushy species poor intact hedgerow with trees. 2 - 3m in height and 2m in width. Hawthorn and bramble predominant species with mature oak trees also present.
36	Small, intact hedge along residential drive comprising mostly holly, with some bramble, hawthorn and hazel
37	Semi-improved grassland with abundant teasel and meadow vetchling, occasional timothy and meadow foxtail, frequent hairy sedge and greater bird's-foot trefoil, sweet vernal grass rare. Low potential for reptiles to be present.
38	Large, intact hedgerow to approximately 8m in height, includes bramble, elder, conifer, ash and traveller's joy. Potential for nesting birds to use.
39	Rank semi-improved grassland to 1m in height, including abundant false oat-grass with Yorkshire fog, cocksfoot, teasel, creeping bent, meadow buttercup, ribwort plantain, hogweed and common ragwort. Low potential for reptiles to be present.
40	Amenity grassland with patches of tall ruderal vegetation including nettle, bramble and common ragwort
41	House martin nest on main building under eaves
42	Mature and semi mature ash and oak trees with dense ivy. Willowherb sp., nettle and cocksfoot patch at base.
43	Semi-mature English oak tree with dense ivy and cavities, potential to be used by roosting bats

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Target Note	Note
44	Hedge approximately 8m in height, intact and species rich - includes mature English oak, ash, hawthorn, hazel, damson and conifer. Hedge bindweed and giant horsetail around base. Potential to be used by nesting birds.
45	Broad-leaved plantation woodland dominated by ash, with sycamore, English oak, hawthorn and immature hazel. Area has potential for dormice.
46	Intact hedgerow contains range of ornamental species such as *Eucalyptus* sp. and *Cupressus* × *leylandii.*
47	Mammal path through grass into hedgerow, characteristic of badger, other signs of which have been recorded in the locality
48	Semi-improved grassland comprising Yorkshire fog, crested dog's tail, common bent, white clover, forget-me-not, black medic, silverweed, willowherb and bird's foot trefoil
49	Bramble scrub with immature ash. Potential for dormice to be present given the connectivity to surrounding woodland and hedgerow habitat. Also likely to be used by nesting birds.
50	Line of trees along boundary of golf course with Berryhill farm. Species include silver birch, *Cypresses* × *leylandii*, lime and ash.
51	Species (moderately) rich with frequent hazel, occasional rose, hawthorn, ivy, elder, blackthorn, holly and oak.
52	Approximately 5x10m garden pond, unable to assess the pond further due to access restrictions.
53	Sward of uniform height (approximately 30cm) semi improved grassland containing frequent patches of sweet vernal grass, soft brome, common sorrel and Yorkshire fog.
54	Nant-y-Moor Reen with frequent hemlock water dropwort, bur-reed, and banks with dense thickets of bramble scrub. Large fish (possible pike) noted within this reen adjacent with confluence with Percored Reen to the east. Potential water voles.
55	Species poor hawthorn hedges 3-4m high and 3m wide dominated by hawthorn and blackthorn. These features function as large wide wildlife corridors.
56	Mature oak tree located in arable land with cavity containing nesting jackdaw at time of survey.
57	Percoed Reen with very clear water, frequent sticklebacks, hemlock water dropwort and meadowsweet. Good potential for water voles, however no signs were found.

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Target Note	Note
58	Percoed Reen with very clear water, arrowhead, frogbit, water horsetail. Large fish seen (possibly pike) and tadpoles (possibly toad). Aquatic macrophyte survey may be required to further assess the quality of this reen.
59	Oak trees located in the middle of arable land, examined with binoculars and no cavities observed. Four lapwings were seen in this field and may have been nesting nearby.
60	Morfa Gronw Reen with abundant duckweed and occasional frogbit. High potential for great crested newt, water voles and important assemblages of aquatic macrophytes.
61	Pont y Cw-Cw Reen with very clear water containing arrowhead. This recently cleared (May 2015) causing a possible drop in botanical diversity that would be expected to return during the course of summer.
	ABP AREA
62	The grassland in this area is similar to that to the south, comprising Yorkshire fog, cocksfoot, false oat-grass, evening primrose, teasel, perforate St. John's wort, willowherb and vervain, however *Juncus* rush, pendulous sedge and mosses are more abundant in this area
63	Small rockpiles, potential hibernacula for reptiles. The rockpile is located within high quality reptile habitat of scattered buddleia, bramble and willow scrub, amongst a mosaic of Yorkshire fog, cocksfoot, teasel, evening primrose, pendulous sedge, mosses and *Juncus* rush. To the north and south the scrub becomes denser.
64	Japanese knotweed, approximately 15x2m
65	Common reed patch approximately 7x7m where the ground is lower and wetter. Dense buddleia scrub is present to the west and east. To the north and south of the reed is 1m high grassland with Yorkshire fog, cocksfoot, *Juncus* rush, evening primrose and teasel.
66	Denser vegetation cover including rush, bramble and willowherb sp.
67	Dense scrub of bramble and buddleia, white poplar, elder
68	Scattered scrub (goat willow, buddleia, gorse; ground flora similar to surrounds, also wild strawberry, cut-leaved cranesbill, self heal, sea aster)
69	Japanese knotweed approximately 10x5m
70	Tall ruderal including evening primrose, bramble and teasel
71	Clay type soil being dug out, surrounded by bramble scrub

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Target Note	Note
72	Bramble abundant, tufted vetch present locally
73	Regenerating grassland comprising Yorkshire fog, false oat-grass and cocksfoot, with forbs such as common sorrel, spear thistle, common ragwort, ox eye daisy, and locally present viper's bugloss
74	Dense bramble scrub
75	Japanese knotweed, approximately 10x2m
76	Mosaic of grassland scattered buddleia, white willow and bramble, with common ragwort, evening primrose, St. John's wort and mosses
77	Similar to target note 38, with some taller dead vegetation (e.g. St. John's wort)
78	High species diversity comprising short ephemeral / perennial species and regenerating grassland (perforate St. John's wort, common centuary, teasel, selfheal, spear thistle, mosses, bramble, vervain, common cinquefoil, scented mayweed, evening primrose, thyme-leaved speedwell, scarlet pimpernel, ribwort plantain, Yorkshire fog, common figwort, willowherb sp., common storksbill, silverweed, brome sp., meadow vetchling, fleabane sp.)
79	Regenerating grassland to 1m in height, includes false oat-grass, Yorkshire fog, common knapweed, spear thistle, common ragwort and narrow-leaved everlasting pea
80	Very dense scrub, bramble and buddleia dominant, silver birch and elder rarely present, with regenerating grassland border characterised by willowherb sp., St. John's wort and mosses
81	A bank of sprawling bramble, with horsetail sp. and brassica sp. frequent along the margin
82	Mosses and short perennial / ephemeral patches within regenerating grassland
83	Patches of buddleia / bramble scrub
84	Tall ruderal patches including teasel, willowherb sp., brassica sp. and St. John's wort
85	Sward dominated by rushes, with sedges and a small patch of bulrush, and Yorkshire fog on the margin
86	Piles of pumice with sand martins nesting within northern side
87	Regenerating grassland and scattered scrub of buddleia, bramble and willow sp.
88	Regenerating grassland including false oat-grass, Yorkshire fog, cocksfoot, common ragwort, St. John's wort and *Brassicaceae* sp.

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Target Note	Note
89	Area of land within MIR Steel land holding. Area disused and established with scattered scrub. Japanese knotweed is throughout this area.
90	Mosaic of woodland, scrub, tall vegetation and bare ground and provides high quality reptile habitats through this area and to the east.
91	Broadleaved semi natural woodland containing frequent goat willow (>5m tall), semi-mature crack willow with occasional elder, hawthorn, elder with bramble and ruderal species in openings.
92	Manmade ground with scattered buddleia scrub. Rubble and other waste have been discarded here. To the west of this is a large, dry disused attenuation pond used previously by MIR Steel. This feature is bare ground and bright orange possibly reflecting past use of this feature.
93	Pond located within willow woodland with lesser pond sedge and yellow flag iris. The pond experiences 80% shade and has high potential for great crested newts.
94	Woodland pond 10x3 m. The pond itself has a low potential for great crested newts, however the adjacent ponds adds value.
95	Common reed bed with areas of open water containing iris and water horsetail. The pond is difficult to access and navigate around but has potential for great crested newts and water voles. A Cetti's warbler was heard in the area.
96	Species rich grassland with frequent sweet vernal grass occasional common sorrel, false fox sedge, black knapweed, Yorkshire fog and meadow buttercup. Yellow rattle was locally abundant.
97	Common blue and small copper butterflies were observed flying in this field.
98	Field ditch with abundant bulrush, goat willow, great willowerb, water starowrt *Callitriche sp* and occasional lesser pond-sedge, common rush, common reed. Potential for water voles and great crested newts.
99	Reens around the NRW office on Broad St Common with possible increase in nutrients. Dense submerged vegetation checked and hair like pondweed *Potamogeton trichoides* found. Unable to access the areas to the site due to access restrictions.
100	Small patch of tall ruderal with willowherb, spear thistle and common nettle, approximately 5x5m where ground level is higher than surrounding semi-improved grassland

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Target Note	Note
101	Low-lying grazing pasture comprising perennial ryegrass, crested dog's tail, sweet vernal grass, soft rush, meadow buttercup and meadow foxtail. Potential for reptiles (notably grass snake) to be present.
102	Field ditch with shallow (approximately 20cm) water containing water plantain, soft rush, hard rush and other emergent vegetation. There is an intact species poor hedgerow on either side of the reen comprised of hawthorn, blackthorn, bramble and crack willow.
103	Defunct and sparse species-poor hedge on both sides of the ditch, includes hawthorn and crack willow
104	Intact species-poor hedge on both sides of the ditch, shrub species includes hawthorn, blackthorn, bramble and crack willow. Nesting birds may use hedgerow.
105	Semi-improved neutral grassland grazing pasture similar to surrounding fields (perennial ryegrass, crested dog's tail, sweet vernal grass, soft rush, meadow buttercup and meadow foxtail), cuckooflower, creeping cinquefoil and red clover additionally recorded here
106	Defunct and sparse species-poor hedge on both sides of the ditch
107	Algal blooms and floating sweet grass present in ditch
108	Sparse patches of willow, bramble and hawthorn along this ditch in contrast to many of the surrounding ditches
109	Patch of dense tall ruderal vegetation – willowherb, spear thistle and nettle – extending 5x5m where ground is raised higher than surrounding grassland
110	Improved grassland grazed by cattle with some small patches of *Juncus* sp., approximately 15%. Limited potential for protected species as heavily grazed
111	Bowkett Field, SINC. Field boundaries consist of semi improved neural grassland with a relatively long sward indicator species including crested dog's tail, common knapweed and sheep's sorrel. Rest of field is marshy grassland containing over 50% Juncus sp. cover. Potential for ground nesting birds, water vole and great crested newts in adjacent reens and field ditches.
112	Barecroft Field SINC. Area of marshy grassland that is relatively species poor. Meadow rue *Thalictrum flavum* present within this field. Potential for ground nesting birds, water vole and great crested newts in adjacent reens and field ditches
113	As at target note 110

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Target Note	Note
114	Intact species-rich hedgerow of hawthorn, blackthorn, English oak, field maple and bramble, with bracken, cleavers, and foxglove along the hedge base. Approximately 2m wide and 4m high. Potential to be used by nesting birds.
115	Intact species-poor hedge 3m high and 2m wide comprised of hawthorn and English oak. Potential to be used by nesting birds.
116	Defunct species-poor hedge, dominated by semi-mature ash trees. Potential to be used by nesting birds.
117	Two mammal pathways through hedgerow to east - characteristic of badger
118	Hedgerow intact to the south but does not connect to hedgerow along north of field
119	Containing ash, hazel, hawthorn, elder, bramble and blackthorn. Approximately 2m wide and 4m high, high potential to be used by nesting birds.
120	Allotments within narrow field (size of field approximately 150x30m)
121	Small, intact garden hedgerow comprising ornamental species such as laurel
122	Species-poor, dense, intact hedgerow, 1-2m high and wide and comprised of hawthorn, bramble and blackthorn. Potential to be used by nesting birds.
123	Intact species-poor hedge comprising bramble, hawthorn and common nettle
124	Semi-improved grassland of perennial rye grass, meadow foxtail, cocksfoot and crested dog's tail, diverse forb assemblage. Potential for reptiles to be present.
125	Defunct species-rich hedgerow along stream, species include hawthorn, blackthorn, willow and elder. Potential for nesting birds in trees though the hedge is quite sparse.
126	Intact, well-maintained hedgerow with no trees approximately 1m in width
127	Patch of Japanese knotweed extending 5x5m in small semi-improved grassland field
128	Semi-improved neutral grassland comprising perennial ryegrass with meadow foxtail, cocksfoot and crested dogs' tail. Potential for reptiles to be present.
129	Between hedgerows is a 2m wide stream with a medium flow speed and gently sloped grazed banks. The stream is 0.5m deep with very little emergent vegetation. Willowherb sp. and hemlock water dropwort are present along the banks. Stream is canalised under the M4. Potential for water voles to be present.
130	Drainage basin, approximately 10m wide and 50m in length, steep 2m high concrete banks. Species present include yellow iris, common reed, bulrush and water plantain. Potential for great crested newts.

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Target Note	Note
131	Solid concrete tunnel. No apparent cavities that might provide bat roost potential.
132	Small semi-improved grassland field with diverse forb assemblage – tufted vetch, red campion, lesser stitch-wort, common mouse-ear and common field speedwell
133	Four very large mature trees with limited bat roost potential as no obvious areas of damage. 2x Ash 2x horse chestnut.
134	Buildings with bat roost potential – further internal investigation required. One very derelict with damage and gaps in roof with high bat roost potential, further internal and/or emergence surveys recommended. Other more modern house boarded up with some gaps under windows and loose tiles on the roof with medium bat roost potential further internal investigation and/or emergence surveys recommended.
135	Tall species poor intact hedgerows in this area form dense continuous barriers throughout this area. Potential for dormouse throughout.
136	Large area of dense scrub along hillside with occasional mature trees Species here included field maple, hawthorn, blackthorn, and hazel. Old hazel coppices noted and a large mature oak trees was noted to the west of this area. Dog's mercury in ground flora. Potential for dormouse.
137	M4 concrete balancing pond containing bullrush and common spiked rush. Water approximately 30cm deep at time of survey.
138	Mammal path through tall grass into the broad-leaved plantation woodland. Characteristic of fox.
139	Species-poor hedge along roadside dominated by hawthorn and bramble
140	Species-rich intact hedgerows either side of narrow lane, comprising hazel, ash, holly, blackthorn and hawthorn. Ground flora include cow parsley, hogweed, meadow buttercup, annual meadow-grass, broad-leaved dock, cleavers, herb-Robert, dogwood, ivy, bracken, hedge bindweed, elder and red campion. Potential to be used by nesting birds.
141	Intact, species-poor hedge 2m wide and high of bramble and hawthorn. Hedge is dense with potential to be used by nesting birds.
142	Heavily cattle grassland with a very short sward, *Lolium perenne* present
143	Area of grassland that is more diverse than its surroundings, approximately 10x10m though with no distinct border. Species include crested dog's tail, meadow foxtail, creeping buttercup, spear thistle, Yorkshire fog and perennial rye grass.

General Notes on Protected Species

Nesting Birds: Dense scrub and woodland is a frequent habitat type along the surveyed areas, and throughout provides suitable habitat for nesting birds unless otherwise stated

Great crested newt and Water vole: Reens and field ditches throughout the surveyed areas are considered as having potential to support water voles, otters and great crested newts unless otherwise stated.

Otter: this species is known to be widespread within location of the proposed new alignment of the M4, consequently, unless otherwise stated main rivers, reens and field ditches are considered to provide suitable habitat.

Target Note	Note
144	Improved grassland grazing field dominated by perennial rye grass with Yorkshire fog, cocksfoot and annual meadow grass additionally present
145	As at target note 140
146	Moor ditch approximately 2m wide, 20cm deep with clear water and steep vegetated banks. Occasional duckweed, floating sweet-grass, water plantain, common water-starwort and soft rush. Abundant common nettle with occasional broad-leaved dock to the north of the ditch and defunct species poor hawthorn hedge to the south. Potential for water voles.
147	Sheep grazed grassland, with some *Juncus* sp. present within land around church. Limited potential for protected species.
148	Improved grassland with perennial rye grass dominant though annual meadow-grass and Yorkshire fog more frequent to the east of the field
149	Dense broad-leaved plantation woodland containing ash, silver birch, willow sp., elder and field maple. Potential to be used by nesting birds. A dense bramble thicket typically 2m wide forms a border between the woodland and field. To the north-west of the woodland the bramble is sparser and rank grassland of false oat-grass, cocksfoot and perennial ryegrass are dominant.
150	Mammal path into bramble characteristic of fox
151	Rogiet Poor Land – Wildlife Trust site – adders known to be present on-site, woodland scrub and grassland. Reserve consists of poor semi-improved grassland and scattered scrub field and woodland. Field species present include red campion, teasel, buttercup, daisy, bramble, wood avens, wood speedwell, wood spurge, red clover, ground ivy, spear thistle, birds foot trefoil, bramble, bracken, oak saplings. Woodland species mainly hazel, ivy, field maple, oak and ash. Potential for dormouse, breeding birds, reptiles (in particular grass snake), foraging bats.
152	Heavily cattle grassland with a very short sward, *Lolium perenne* present
153	Heavily cattle grassland with a very short sward, *Lolium perenne* present
154	Not Used
155	Small section of semi natural broadleaved woodland. Species include hawthorn, field maple, rose, elm, hazel, bramble, oak, ivy and ash. Potential for dormouse. The woodland is very young trees with no bat roost potential. There is a line of ash trees to the west of the road (very small section on map) which have low potential for bat roost i.e are of an age and size to support a bat roost but no obvious features