Smart Motorways Programme

Jacob Atkins JV

M56 Junction 6 to 8

Environmental Assessment Report

Appendix C

August 2018

Notice

Appendix C – Ecology

Appendix C.1 - M56 Junction 6 - 8 Smart Motorway Protected Species Report

highways england

Smart Motorways Programme

Jacobs Atkins JV

M56 Junction 6 to 8 Smart Motorway: Notable and/or Legally Protected Species Report

August 2017

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1. Introduction

1.1. Purpose of This Report

1.1.1. This report presents a summary of the findings of the following notable and legally protected species assessments and surveys undertaken to inform potential ecological constraints for the M56 Junctions 6 - 8 Smart Motorway Project (herein referred to as the Proposed Scheme):

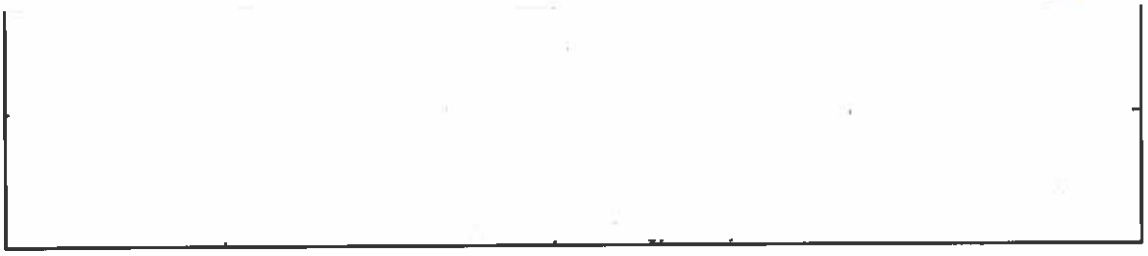
- Broad habitat mapping;
- Habitat Suitability Index (HSI) assessments for great crested newt (*Triturus cristatus)*;
- Environmental DNA technique (eDNA) surveys for great crested newt;
- Preliminary bat roost assessments;
- Preliminary badger surveys (*Meles meles*);
- Identification of invasive plant species;
- Habitat suitability assessments for water vole (*Arvicola amphibious*), otter (*Lutra lutra)*, white-clawed crayfish (*Austropotamobius pallipes)*, nesting birds and reptiles.

1.1.2. The information gathered has been used to inform the Environmental Assessment Report (EAR) and Outline Environmental Management Plan (OEMP). It will also inform the requirement for (or otherwise), and provide background information to support any European Protected Species Mitigation (EPSM) licence applications.

1.1.3. This report has been produced by qualified and competent experts, as summarised in Table 1.1.

Table 1.1 Professional competence

Name	Grade and Company	Expertise and Professional Qualification



1.2. Study area

1.2.1. The Proposed Scheme footprint for the assessment has been taken as being within the existing M56 highway boundary between Junction 6 (Manchester Airport), and Junction 8, as this is the extent of habitat clearance required for the Proposed Scheme.

1.2.2. An additional 50m buffer from the highways boundary has been included within the study area. This is to allow for survey of any potential notable and/or legally protected species utilising areas close to any proposed works. Standing waterbodies and ditches within 500m and flowing watercourses within 50m of the highway boundary are also included in the study area.

1.2.3. The study area and European Designated sites within 30km of the Proposed Scheme are presented in Figure 1 (HA549345-JAJV-EEC-SG-DR-GI-01).

1.2.4. All proposed works will be within the highways boundary, with the exception of the site compound, the location of which is not currently known.

1.3. Study objectives

1.3.1. The Ecological Zone of Influence (EZoI) [1] is the area over which the ecological features may be subject to significant effects as a result of the proposed project and associated activities. The EZoI is determined through an assessment of many interacting factors such as species mobility, or distribution variation. An EZoI was determined for the following species, the decision to use a minimum buffer of 50m was precautionary. A precautionary approach was applied due to the timing of surveys undertaken prior to the release of final design information and due to species local movements from their respective habitats.

- Great crested newt (EZoI is all waterbodies within the Proposed Scheme plus a 500m buffer);
- Bats (EZoI is the Proposed Scheme plus a 50m buffer);
- Otter, water vole and white-clawed crayfish (EZoI is all waterbodies crossing the Proposed Scheme plus a 50m buffer upstream and downstream);
- Badger (EZoI is the Proposed Scheme plus a 50m buffer);
- Common and widespread species of reptile (EZoI is the Proposed Scheme plus a 50m buffer);
- Nesting birds (EZoI is the Proposed Scheme plus a 50m buffer), and;
- Non-native invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) (EZoI is the Proposed Scheme plus a 50m buffer).

1.3.2. The Proposed Scheme is considered to be outside the known range of Hazel Dormouse and European Protected Species of reptile, these groups were therefore not considered in this study.

1.3.3. The aim of the study was to map the habitats within the Proposed Scheme and to assess the potential for notable and/or legally protected species to be present within the EZoI, as defined for each species.

1.3.4. To achieve this, the following objectives were set:

- Identify any potential great crested newt breeding waterbodies within 500m of the highway boundary;
- Identify any potential for commuting and foraging bats and bat roosting sites within 50m of the highway boundary;
- Identify any badger setts within 50m of the highway boundary;
- Identify any habitat with the potential to support otter, water vole and white-clawed crayfish 50 m upstream and downstream of any watercourses that cross or are within close proximity of the Proposed Scheme;

[1] The EZoI is based on professional judgement with respect to the individual species and potential impacts

- Identify any habitat with the potential to support common and widespread reptiles and nesting birds within 50m of the highway boundary;
- To confirm presence or likely absence of great crested newt, otter, water vole and badger;
- To determine the potential of any ecological features identified to support any of the above species, e.g. trees with bat roosting potential or watercourses with suitable habitat for otter.
- Map the habitats within the highways soft estate broadly according to the Phase 1 habitat classifications from the JNCC Handbook for Phase 1 Habitat Survey (JNCC, 2010)[2].
- Map and identify any invasive species within 50m of the highway boundary.

1.3.5. The report aims to identify all relevant ecological data, in order to establish a robust baseline, to be utilised for the purposes of assessment within an Environmental Assessment Report (EAR). The findings of this report inform the likely requirement for further assessment, survey, mitigation or the potential requirement for protected species licensing, based on the potential impacts of the Proposed Scheme.

1.3.6. A summary of the current relevant legislation for the protected species, sites and habitats included in this report is attached in Appendix B. This report has been prepared by an environmental specialist and does not purport to provide legal advice.

[2] Joint Nature Conservation Committee (2010) Handbook for Phase 1 habitat survey - a technique for environmental audit. http://jncc.defra.gov.uk/PDF/pub10_handbookforphase1habitatsurvey.pdf

2. Methodology

2.1. Desk study

2.1.1. The M56 J6 – 8 Environmental Scoping Report (HE549345-JAJV-EGN-SG_MULTI-RP-LE-0006)[3] was consulted and a data request was also submitted to the Local Environmental Records Centre (LERC) to obtain ecological information about notable and/or legally protected species present within 1km of the Proposed Scheme Searches for designated statutory sites within 2km, non-statutory sites within 1km, S41 priority habitats within 500m and SACs with bats as qualifying features within 30km of the Proposed Scheme were also undertaken. Herein, these areas are referred to as the Study Areas. Data was obtained from the following sources:

- Greater Manchester Ecology Unit (GMEU);
- Biodiversity Information Centre for Cheshire, Halton, Warrington & Wirral (RECORD);
- Multi-Agency Geographic Information for the Countryside (MAGIC) website http://magic.defra.gov.uk/MagicMap.aspx;
- Aerial photography;
- Ordnance Survey mapping; and
- Highways England Environmental Information System (EnvIS) biodiversity GIS data comprising species point data.

2.1.2. The scope of this assessment is in accordance with the Scoping Report and the Highways England Interim Advice Note (IAN). The Scoping Report was made available by Highways England to JAJV in July 2017 following completion of the ecological surveys. The following deviations from the recommendations in the Scoping Report are noted below:

- Habitats – the scoping report states an extended phase 1 habitat survey would be completed. Instead, broad habitat mapping was completed for habitats in the soft estate as this was considered a suitable level of detail to inform the detail design of the Proposed Scheme.
- Great crested newt –the Scoping Report recommended that where no data is available following assessment, to complete works under a precautionary method of working (PMW). This approach was not considered acceptable as a PMW should only be implemented where it is considered reasonably unlikely that great crested newts will be present, however, implementing a PMW on the basis that no data is available is a significant risk and would leave all parties open to prosecution should great crested newts be found during the construction works. It is not always possible to gather all necessary survey data in one season owing to programme and access constraints and therefore the approach of gathering survey data over two seasons has been adopted as per previous agreement with Natural England on other Highways England schemes such the A5036 Port of Liverpool and the M62 Chain Bar project. The current programme allows surveys to be staged over 2 survey seasons (2017 / 2018), with sufficient data collected to inform licencing prior to construction.
- Badger – the Scoping Report recommends targeted surveys to be completed in November/December 2017. These surveys have been brought forward and are being completed through September/October 2017. Badger surveys are easier to undertake in November/December when vegetation has died back, based on the habitats within the soft estate undertaking the surveys in September/October is not considered a risk.
- White Clawed Crayfish, Otter & Water vole surveys – the Scoping Report states that surveys of water course should cover 200m up and down stream of the Proposed Scheme. This has been reduced to 50m as this is assessed as the likely zone of influence for these features.

Identification of waterbodies

2.1.3. The predicted EZoI for great crested newts is 500m and, therefore, waterbodies within 500m of the Proposed Scheme extent were identified from Ordnance Survey maps and readily available aerial photographs and a review of the data provided in the scoping assessment.

[3] Smart Motorways Programme, M56 Junction 6 to 8, Environmental Scoping Report, July 2017

2.2. Field Survey

Broad Habitat Mapping

2.2.1. Broad habitat mapping within the Highway boundary was undertaken between 4 April 2017 – 12 June 2017 by suitably qualified ecologists (Atkins and Jacobs). This survey method records information on broad habitat types together with evidence of and potential for legally protected and notable fauna.

2.2.2. The Study Area was surveyed, where access was allowed, for any evidence of and potential for legally protected and notable fauna according to CIEEM guidance[4].

2.2.3. The habitat types found within the Highways Boundary (Soft Estate) were mapped broadly following the Phase 1 habitat classifications from the JNCC Handbook for Phase 1 Habitat Survey (JNCC, 2010)[5]. Target notes were recorded to identify species compositions and invasive plant species within the habitats mapped. During the walkover survey, the following was also recorded:

- Potential roosting sites for bats within trees and structures;
- Signs of badger activity including setts, tracks, snuffle holes and latrines;
- The suitability of watercourses for otter, water vole and white-clawed crayfish;
- The suitability of habitats for nesting birds (including any old nests);
- The suitability of habitats for common and widespread British species of reptile (adder (*Vipera berus*), grass snake (*Natrix natrix*), slow worm (*Anguis fragilis*) and common lizard (*Lacerta vivipara*);
- Evidence of the presence of certain invasive plants listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended).

Great Crested Newt

2.2.4. The terrestrial habitat of great crested newts can extend to include habitats up to 500m[6] from a breeding waterbody but they will generally stay in suitable habitat within 250m of the breeding pond[7]. Therefore, waterbodies were scoped out and survey work was not carried out on waterbodies over 250m from the Proposed Scheme. One pond (7-GCN-106) located approximately 275m from the Proposed Scheme was scoped in due good habitat connectivity to the Proposed Scheme. Waterbodies within 250m of the Proposed Scheme were also excluded if there were major barriers present such as watercourses and major roads, preventing newts being affected from the Proposed Scheme. A summary of the waterbodies identified, their distance from the Proposed Scheme and the reasons why waterbodies were not assessed is provided in Appendix A.1.

2.2.5. Ninety-five waterbodies suitable for great crested newts were scoped in for Habitat Suitability Index (HSI) and Environmental DNA (eDNA) assessment.

Habitat suitability assessment

2.2.6. Due to restrictions resulting from unsuccessful access arrangements with a land owner, it was not possible to visit three of the scoped-in waterbodies. The remaining ninety-two waterbodies were visited between March and June 2017, forty-nine of which were assessed for their potential to support great crested newt using the HSI assessment[8] by suitably qualified ecologists (Atkins and Jacobs). The remaining forty-three were deemed unsuitable for HSI upon inspection and were scoped out of further eDNA survey. This technique provides a standardised assessment of

[4] Chartered Institute of Ecology and Environmental Management (2013) *Guidelines for Preliminary Ecological Appraisal.*
[5] Joint Nature Conservation Committee (2010) Handbook for Phase 1 habitat survey - a technique for environmental audit http://jncc.defra.gov.uk/PDF/pub10_handbookforphase1habitatsurvey.pdf
[6] Great Crested Newt Mitigation Guidelines, English Nature, 2001
[7] An assessment of capture techniques and the value of different habitats for Great Crested Newt Triturus cristatus, Cresswell & Whitworth, English Nature Research Report No. 576, 2004
[8] Oldman, R. S., Keeble, J., Swan, M. J. S., and Jeffcote, M. (2000). *Evaluating the Suitability of Habitat for the Great crested newt (*Triturus cristatus*)* Herpetological Journal 10 (4), 143-155.

the potential of a waterbody to support great crested newt and is recognised by the licencing authorities. The HSI is calculated using ten habitat variables ('suitability indices') which are known to affect the survival of great crested newt. These are:

- Geographical location (i.e. with respect to the range of great crested newt);
- Water-body area;
- Permanence of water (estimated number of years a waterbody is likely to dry out in spring, per decade);
- Water quality;
- Percentage shade of waterbody margin;
- Presence of waterfowl;
- Occurrence of fish;
- Water-body density;
- Connectivity and quantity of suitable terrestrial habitat; and
- Macrophyte (aquatic plant) coverage.

2.2.7. Each habitat variable is assessed by experienced surveyors in the field. The ten suitability indices are combined to derive the final HSI score for the water-body. The HSI, expressed as a value between 0.01 and 1.0, is then categorised as shown in Table 2-2-1.

Table 2-2-1 HSI score and suitability of the aquatic habitat for great crested newt[9]

HSI Score	Suitability of the Aquatic Habitat for great crested newt
0.01 – 0.49	'Poor'
0.50 – 0.59	'Below average'
0.60 - 0.69	'Average'
0.70 – 0.79	'Good'
0.80 – 1.00	'Excellent'

Presence / Absence Surveys – eDNA Survey Techniques

2.2.8. The eDNA presence / absence surveys were carried out at seven waterbodies. This was undertaken in June 2017 by suitably qualified ecologists (Atkins and Jacobs). Of the forty-nine waterbodies given a HSI score, forty-two waterbodies did not undergo further eDNA survey after an initial survey visit as they were either; not present, dry, had pre-existing data taken from surveys of the same waterbodies for a previous Scheme (five waterbodies), were inaccessible, had unsuitable breeding habitat for great crested newts or found to be joined to other waterbodies and counted as one with them. The eDNA technique provides a standardised assessment of a waterbody to support great crested newt and is recognised by the licencing authorities.

2.2.9. The eDNA sampling followed the methodology provided by DEFRA in Appendix 5 of the report for DEFRA project WC10673: Analytical and methodological development for improved surveillance of the Great Crested Newt[10]. The survey involved taking water samples at each suitable waterbody to send for laboratory analysis to test for the presence of great crested newt eDNA. The technique has been accepted by Natural England as a suitable alternative for conventional presence / absence surveys[11]. This technique is currently unable to provide an estimate of population size class and can therefore not be used solely for licencing purposes.

[9] Taken from: Oldman, R. S., Keeble, J., Swan, M. J. S., and Jeffcote, M. (2000). *Evaluating the Suitability of Habitat for the Great crested newt (*Triturus cristatus*)* Herpetological Journal 10 (4), 143-155.
[10] Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford
[11] https://www.gov.uk/guidance/great-crested-newts-surveys-and-mitigation-for-development-projects

2.2.10. The water sampling was carried out by licenced great crested newt surveyors (2016-22307-CLS-CLS 2017-27599-CLS-CLS and 2015-9488-CLS-CLS) within the optimal window for survey (15 April – 30 June). Water samples were stored in a fridge in accordance with the DEFRA methodology before being couriered to the laboratory. The laboratory undertaking the analysis of samples was Nature Metrics[12].

Bats

2.2.11. All preliminary bat roost inspections were undertaken between March and July 2017 by suitably qualified ecologists and members of CIEEM (- Atkins; Jacobs seasonal staff), in accordance with Bat Surveys for Professional Ecologists: Good Practice Guidelines[13].

2.2.12. All structures (including overbridges, under bridges and culverts) that cross the Proposed Scheme and trees within 50m of the Scheme extent, where access allowed, were inspected and assessed for bat roosting potential.

2.2.13. Each structure was visited and inspected from ground level. All accessible sections of the structures were systematically searched for bats, or evidence of their presence (such as droppings, urine stains, scratch marks, or feeding remains) using a torch to inspect features including any joints, gaps, cracks, crevices, ledges, drainage pipes or ducts or any internal voids.

2.2.14. For trees, similar evidence was recorded with the same equipment but targeted features included; woodpecker holes and rot holes, cracks, voids, dense ivy and flaking bark. Inspections were made from the ground only.

2.2.15. Any areas that could not be searched but may have bat roosting potential were noted.

2.2.16. An assessment of each structure and tree's potential roosting value for bats was made against the criteria given in Table 2-2-2 below. The likelihood of roost presence was given as either: negligible, low, moderate, high or confirmed presence.

[12] http://www.naturemetrics.co.uk/services/edna/great-crested-newt
[13] Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1

Table 2-2-2 Bat roosting potential criteria for assessing structures and trees[14]

Likelihood of roost presence	Criteria
Negligible	Negligible habitat features on site likely to be used by roosting bats. **Examples**: bridges and culverts sealed completely with no cracks in mortar or internal spaces or made of steel/concrete.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions[15] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation[16]). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential[17]. **Examples**: Modern bridges with cracks in brickwork or concrete; structures with features which could be used as roosts but with poor connectivity to habitats in the wider landscape. Structures with high level of human disturbance, external lighting, or highly urbanised.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed). **Examples**: Structures with many features or access points that could be used by individual roosting bats; structures with connectivity to habitats in the wider landscape.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. **Examples**: Old structures with many access points into internal spaces which could be used by many bats; stone or brick structures. Structures linked to high quality habitat features in the wider countryside e.g. water/woodland. Structures with low level of human disturbance.
Confirmed roost	Is a known bat roost

Badger

2.2.17. All badger surveys were carried out between March and July 2017 by suitably qualified ecologists (Atkins; Jacobs seasonal staff), in accordance with good practice guidance[18] and CIEEM competencies for undertaking badger surveys[19].

[14] Adapted from: Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1
[15] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance
[16] Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten et al., 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.
[17] This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015
[18] Harris, C., *et al* (1989) Surveying Badgers, *Mammal Society*.
[19] CIEEM (April, 2013) *Competencies for Species Survey: Badger*.

2.2.18. Badger evidence was recorded during walkover surveys of the Proposed Scheme and surrounding land, the Study Area, with the exception of any areas deemed unsafe or with restricted access. Incidental records of badger evidence outside 50m of the highways boundary are also included in Table 4-4-2 in Appendix A.3 for context.

2.2.19. Evidence recorded focussed on identifying setts but also included signs of badger activity dung pits, paw prints, snuffle holes (created when foraging), push-through/pathways, hairs (caught on fencing) and scratching posts, within the survey area.

2.2.20. Any setts discovered were classified using the criteria[20] given in Table 2-2-3 below. Setts were classified as either main, annexe, subsidiary or outlier. Where sett classification could not be established, no classification was assigned. Sett activity level was also recorded. The classification of setts was made based on the evidence available at the time.

Table 2-2-3 Classification of Badger Setts

Likely Status	Typical Features
Main	Several holes with large spoil heaps and obvious paths emanating from and between sett entrances.
Annexe	Normally less than 150m from main sett, comprising several holes. May not be in use all the time, even if the main sett is very active.
Subsidiary	Usually at least 50m from main sett with no obvious paths connecting to other setts. May only be used intermittently.
Outlier	Little spoil outside holes. No obvious paths connecting to other setts and only used sporadically. May be used by foxes and rabbits.

2.2.21. The sett activity level was determined using the following criteria:

- **Active setts** – the sett shows obvious signs of current use[21] such as fresh spoil, footprints, bedding and hairs, no obstructions in entrance.
- **Partially used setts** – entrances may have leaves or twigs in the entrance and/or mossed and other plants growing around the entrance.
- **Disused setts (not active)** – entrances may have fallen leaves, cobwebs or may even be blocked with sticks, stones or earth. Vegetation, including mosses may be growing in the entrance or on old spoil just outside. No signs of current use by badgers.

Otter

2.2.22. Otter surveys were carried out between April and May 2017 and September 2017 by suitably qualified ecologists (- Atkins; - Jacobs seasonal staff), with reference to good practice guidance set out in the Design Manual for Roads and Bridges (DMRB)[22], and CIEEM competencies for undertaking otter surveys[23].

2.2.23. Should otter be using watercourses within the 50m of the Proposed Scheme there is the potential for impacts to occur through direct disturbance and indirect disturbance via works to or within close proximity to the watercourses such as noise, lighting, water pollution and blockage of commuting and foraging routes. All watercourses within 50m of either carriageway of the scheme were targeted for otter survey. Otter evidence was recorded during a walkover of both

[20] Harris, C., *et al* (1989) Surveying Badgers, *Mammal Society*.
[21] Natural England (June, 2009) *Protection of Badgers Act 1992 (as amended) Guidance on 'Current Use' in the definition of a Badger Sett.*
[22] *The Design Manual for Roads and Bridges DMRB Volume 10, Section 1 Part 9 HA 81/99 Chapter 7, Grogan*
[23] CIEEM (April, 2013) *Competencies for Species Survey: Eurasian Otter.*

banks, or while wading down the watercourse where access was safe. Evidence was recorded up to 50m up and downstream of the highway boundary and used to assess habitat suitability for otter. Guidance as to the suitability of the watercourses for otters was taken from Natural England's "Ecology of the European Otter"[24].

2.2.24. Evidence of otter activity could include:

- Holts: a cavity or hole in a river bank, in the ground, under tree roots, within rocks or caves where the back cannot be readily seen. If active this will usually contain field evidence such as spraints.
- Hovers: a bolt hole or ledge that will afford an otter temporary cover or a place to feed on captured prey. The back of the hover can usually be seen. If active there may be footprints, feeding evidence or spraints.
- Couches: above ground where an otter can lie up or groom; these may take the form of a simple swirl or depression in tall grasses where the otter has laid, or may be covered in a vegetated grass or reed 'roof'.
- Spraints (droppings).
- Feeding remains.
- Paths and slides (defined otter paths on watercourse banks and mud slides evident of where the animal regularly enters or exits the watercourse);
- Footprints.

Water Vole

2.2.25. All water vole surveys were carried out between April and May and September 2017, by suitably qualified ecologists (Atkins; – Jacobs seasonal staff), in accordance with good practice guidance[25] and CIEEM competencies for undertaking water vole surveys[26].

2.2.26. All watercourses which flowed under either carriageway of the scheme were targeted for water vole survey. Water vole evidence was recorded during a walkover of both banks, or while wading down the watercourse where access was safe. Evidence was recorded up to 50m up and downstream of the highway boundary and used to assess habitat suitability for water vole.

2.2.27. Evidence of water vole activity could include:

- Burrows;
- Latrines;
- Feeding stations and 'lawns' (area around burrow entrances where there is grazed vegetation, surrounded by taller vegetation);
- Runways and footprints;
- Sightings; and
- Sounds (characteristic sound when water voles enter the water to warn other water voles in the area of possible danger).

White Clawed Crayfish

2.2.28. An assessment of white-clawed crayfish habitat suitability was carried out between March and July and October 2017, by suitably qualified ecologists (- Atkins;

[24] Chanin P (2003). *Ecology of the European Otter.* Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough.
[25] The Water Vole Mitigation Handbook, 2016
[26] CIEEM (April, 2013) Competencies for Species Survey: Water Vole.

– Jacobs seasonal staff), in accordance with good practice guidance[27] and CIEEM competencies for undertaking white-clawed crayfish surveys[28].

2.2.29. The suitability of a water course to support white-clawed crayfish was based on water quality, substrate and suitable refuges.

2.3. Survey Limitations

2.3.1. Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. Therefore, the surveys of this Proposed Scheme have not produced a complete list of plants and animals and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. However, the results of the surveys have been reviewed and are considered to be sufficient for the purposes of the assessment reported in the EAR.

2.3.2. The habitat survey was carried out as a combination of views from accessible third party land, views from footpaths and online aerial and Street View imagery. Taking into account the age of the habitats present and the details of the Proposed Scheme, this does not provide a significant limitation to the assessment, as rare or uncommon habitats are not expected to be present

2.3.3. The search for water bodies within 500 m of the Site was undertaken by using Ordnance Survey plans and aerial photographs only. These sources may not show all ponds and or water bodies within 500 m of the Site boundary and therefore some water bodies may not have been identified. This limitation was somewhat mitigated by the discovery of previously unidentified waterbodies during the HIS and eDNA surveys. Furthermore, where surveys were undertaken results are considered to be representative of the wider area.

2.3.4. The list of invasive plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) is extensive and these plants are found in a range of different habitats, including aquatic habitats. The walkover survey checked for the presence of any species on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) including Japanese knotweed (*Fallopia japonica*), giant knotweed (*Fallopia sachalinensis*), hybrid knotweed (*Fallopia x bohemica*), rhododendron (*Rhodenderon* sp), cotoneaster species (*Cotoneaster* sp), giant hogweed (*Heracleum mantegazzianum*) and Himalayan balsam (*Impatiens glandulifera*). Other invasive species, in particular those associated with aquatic habitats may not have been recorded, but it is considered that this survey is sufficient to identify any constraints posed by invasive species.

2.3.5. Other limitations that were encountered while surveying the Proposed Scheme included:

- Adverse weather conditions during surveys limiting visibility or species detection;
- Access restrictions to certain areas of highways, structures and surrounding land that would be hazardous to access due to being fenced off or high-speed traffic etc.;
- Access restrictions to waterbodies, e.g. steep/unstable or heavily vegetated banks, preventing eDNA surveys which require access to at least 80% of the bank of a waterbody; and
- Visibility restrictions due to extremely dense areas of vegetation and steep banks that would be hazardous to attempt to access or climb/descend.

2.3.6. The results of this report facilitate an evaluation of the likely ecological constraints to the Proposed Scheme. Conclusions have been reached, on the basis of the best available scientific evidence, derived from surveys undertaken in line with recognised methodology and best practice, and on the basis of professional ecological judgement.

[27] Monitoring the White-clawed Crayfish, Conserving Natura 2000 Rivers, Monitoring Series No. 1, 2003
[28] CIEEM (April, 2013) Competencies for Species Survey: White Clawed Crayfish.

2.3.7. This report has only included those areas that may be impacted by the Proposed Scheme. At the time of writing the location of site compounds where unknown and therefore once site compound locations are identified further survey and assessment may be required.

2.3.8. The results of this report facilitate an evaluation of the likely ecological constraints to the Proposed Scheme. Conclusions have been reached on the basis of the best available scientific evidence derived from surveys undertaken in line with recognised methodology and best practice and on the basis of professional ecological judgement.

2.3.9. Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. The ecological surveys undertaken to support this EcIA have not therefore produced a complete list of plants and animals and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. However, the results of these surveys have been reviewed and are considered to be sufficient to undertake the Environmental Assessment Report.

3. Results

3.1. Broad Habitat Mapping

Desk Study

3.1.1. One internationally designated site for nature conservation, Rostherne Mere lies within the Study Area but outside the EZoI for the Proposed Scheme. Rostherne Mere Ramsar lies approximately 350m to the south of the footprint of the Proposed Scheme. This Ramsar is primarily designated for its wintering wildfowl populations. The mere is also designated as a SSSI and forms part of a series of open water and peatland habitats across the region which collectively is referred to as the North West Midlands Meres & Mosses. The SSSI covers a larger area than the Ramsar site and lies approximately 250 m to the south of the M56 at its closest point which is within the Study Area but outside the EZoI.

3.1.2. Rostherne Mere Ramsar has also been assessed separately as part of the Habitat Regulations Assessment report for the Proposed Scheme, the details of which have been summarised within this report.

3.1.3. Two further statutory designated sites for nature conservation, Cotterill Clough SSSI (situated approximately 750m south of junction 6) and Dunham Park SSSI (situated approximately 1.5km NW of junction 7). Both sites lie within the Study Area but outside the EZoI for the Proposed Scheme with no ecological pathways between the sites and the Proposed Scheme. These statutory designated sites are not considered further within this report.

3.1.4. Thirteen non-statutory designated sites for nature conservation are situated within the Study Area. Seven of these lie within 200m of the Proposed Scheme or are hydrologically linked to the Proposed Scheme and therefore fall within the EZoI, these are:

- Sunbank Wood and Ponds Site of Biological Interest (SBI) - 20m south of Proposed Scheme
- Jackson's Bank East Local Wildlife Site (LWS) – adjacent to Proposed Scheme
- Rossmill (SBI) – adjacent to Proposed Scheme
- Hancock's Bank North (LWS) – adjacent to Proposed Scheme
- Hancock's Banks South (LWS) – adjacent to Proposed Scheme
- Ryecroft Covert (LWS) – adjacent to Proposed Scheme
- Yarwood Heath Covert (LWS) – 45m north of Proposed Scheme

3.1.5. All designated sites within the Study Area are shown in the EAR in Figure 2.2 - Statutory Designated Sites and Habitats of Principal Importance; and Figure 2.3 – Non-Statutory Designated Sites and Protected/Notable Species.

3.1.6. In terms of S41 priority habitats, the following are found within or immediately adjacent to the Proposed Scheme, as detailed in the Scoping Report (HE549345-JAJV-EGN-SG_MULTI-RP-LE-0006):

- Deciduous Woodland: scattered along the extent of the Proposed Scheme, with patches flanking both carriageways east of Junction 7 and along the banks of the River Bollin, which intersects the Proposed Scheme between Junctions 6 and 7.

3.1.7. With regard to ancient woodland, three sites are located within 200m of the Proposed Scheme, as detailed in the Scoping Report (HE549345-JAJV-EGN-SG_MULTI-RP-LE-0006). Two of these sites (Hancock's Bank North and Hancock's Bank South) are located within 15m of the highway boundary which is less than Natural England and the Forestry Commission's standing advice for

planning authorities which advises that a minimum buffer of 15m should be maintained between ancient woodland and development[29].

Field Survey

3.1.8. The list below details the habitats as described in the JNCC Handbook for Phase 1 Habitat Survey (JNCC, 2010)[30] situated within the Study Area.

3.1.9. Habitats recorded on site during walkovers between April and June 2017 were:

- Broadleaved semi-natural woodland;
- Broadleaved plantation woodland;
- Mixed plantation woodland;
- Broadleaved scattered trees;
- Dense/continuous scrub;
- Scattered scrub;
- Species poor semi-improved grassland; and
- Ditch.

3.1.10. These habitats are indicated on Figure 1.1 – 1.6 Phase 1 Habitat Survey and Invasive Species Results shown on drawing HA549345-JAJV-EEC-SG-MULTI-DR-GI-0101 with specific features and species assemblages highlighted by target notes (TN) on the drawing. TN descriptions are provided in Appendix C. See Appendix B for relevant legislation.

3.1.11. Several non-native invasive plant species were also recorded in a number of locations across the Proposed Scheme during the walkover surveys. Species recorded included:

- Himalayan balsam;
- Giant Hogweed;
- Japanese knotweed; and
- Rhododendron.

3.1.12. The locations of these species are indicated on Figure 1.1 – 1.6 Phase 1 Habitat Survey and Invasive Species Results shown on drawing HA549345-JAJV-EEC-SG-MULTI-DR-GI-0101 highlighted by target notes (TN) on the drawing. Non-native invasive plant species descriptions are provided within the target notes and are provided in Appendix C.

3.2. Great crested newt

Desk Study

3.2.1. Desk study records for great crested newts, returned by GMEU and RECORD, are shown on Figure 2.3 Notable and Protected Species (HA549345-JAJV-EEC-SG-MULTI-DR-GI-0203).

3.2.2. EnvIS species data contains records of three GCN breeding ponds to the east of Junction 7. The closest of these is near Ryecroft Farm 70m north of the existing carriageway, recorded in 2008.

3.2.3. RECORD provided seven recent[31] records of great crested newt within the desk study area:

- Four records close to Rostherne Mere, located approximately 415m to the south of the Proposed Scheme;

[29] https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences
[30] Joint Nature Conservation Committee (2010) Handbook for Phase 1 habitat survey - a technique for environmental audit. http://jncc.defra.gov.uk/PDF/pub10_handbookforphase1habitatsurvey.pdf
[31] Recent is taken to be in the last 10 years

- One record at junction 7, located approximately 50m to the north of the Proposed Scheme.
- Two records between junctions 6 and 7, located approximately 140m and 240m to the north of the Proposed Scheme.

Field survey

3.2.4. One hundred and fifty-four waterbodies were identified during the desk study. Of these, a total of ninety-five were scoped in (the remaining were not surveyed due to them being in unsuitable locations for great crested newts). Ninety-two were visited between March and June 2017 with three of the ninety-five not being surveyed due to issues preventing access . A summary of the waterbodies identified and their distance from the Proposed Scheme is provided in Appendix A.1.

3.2.5. Of these ninety-two waterbodies forty-three were deemed as unsuitable habitat for great crested newts during the HSI assessment and scoped out. The remaining forty-nine were assessed for their potential to support great crested newt using the HSI assessment and given a HSI score by suitably qualified ecologists (Atkins and Jacobs). These waterbodies were scoped in for eDNA assessment.

3.2.6. During the eDNA survey visits forty-two of the forty-nine waterbodies were not surveyed as they had either dried out since the HSI survey, had pre-existing data taken from surveys of the same waterbodies for a previous Scheme (five waterbodies) or new access limitations had arisen preventing a safe survey of the waterbody.

3.2.7. Great crested newts were confirmed as present in two of the seven waterbodies subject to eDNA surveys (results from 'positive' eDNA analysis of water samples).

3.2.8. Great crested newts are assumed absent in five of the seven waterbodies surveyed (results from 'negative' eDNA analysis of water samples).

3.2.9. A summary of the findings for each waterbody is provided in Table 3-3-1 in Appendix A.1 – Great Crested Newt. Results are indicated on Figure 2.1 - 2.6 Great Crested Newt Survey Results, shown on drawing HA549345-JAJV-EEC-SG-MULTI-DR-GI-0201.

3.3. Bats

Desk Study

3.3.1. Desk study records for bats, returned by GMEU and RECORD, are shown on Figure 2.3 Notable and Protected Species (HA549345-JAJV-EEC-SG-MULTI-DR-GI-0203).

3.3.2. GMEU and RECORD provided recent records[32] of a number of bat species including brown long-eared bat (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrellus*), brandt's bat (*Myotis brandtii*), Daubenton's bat (*Myotis daubentonii*), Myotis sp. (*myotis sp*), nathusius's pipistrelle (*Pipistrellus nathusii*), natterer's bat (*Myotis natterer*), noctule bat (*Nyctalus noctula*), nyctalus bat (*Nyctalus sp.*), Pipistrelle sp.(*Pipistrellus sp.*), soprano pipistrelle (*Pipistrellus pygmaeus*), and whiskered bat (*Myotis mystacinus*). The closest record is a common pipestrelle located within the Proposed Scheme close to the off-slip road at Junction 7.

3.3.3. Several of the bat records, provided by GMEU, were for bat roosts:

- Pipistrelle sp. - an uncategorised roost (located approximately 1.3km from the Proposed Scheme (near Junction 6);
- Whiskered bat -One uncategorised roost (located approximately 630m from the Proposed Scheme) (near Junction 6); and

[32] Recent records are no more than 10 years old.

- Brown long-eared bat - One uncategorised roost (located approximately 890m from the Proposed Scheme) (near Junction 6).

3.3.4. There are no Special Areas of Conservation (SAC) with bats as qualifying features within 30km of the Proposed Scheme.

Field Surveys

3.3.5. Fifteen structures and sixty-three trees were identified between March and June 2017 within 50m of the Proposed Scheme.

- No confirmed roosts were identified.
- Three structures (bridges at the River Bollin, Thornsgreen and Cow Lane) and three trees were deemed to have high bat roosting potential during an initial inspection.
- Five structures (bridges at Wilmslow road, Chapel Lane, Castle Mill Lane, Ashley Railway and Yarwood Heath Lane) and sixteen trees were deemed to have moderate bat roosting potential during an initial inspection.
- Three structures (bridges at Ryecroft Foorbridge, Bowden View and Chester Road Bridge) and forty-four trees were deemed to have low bat roosting potential during an initial inspection
- Two structures (bridges at Hasty Lane Sunway and Birkin Culvert) were deemed to have negligible bat roosting potential during an initial inspection.
- Two structures (bridges at River Bollin Tributary Culvert and Ashley Hall Road) were not assessed due to access restrictions.

3.3.6. The majority of roost features observed had formed from defects in the concrete bed structure. Other roost features included gaps between the abutment, span and wing wall, and cracks in abutments.

3.3.7. A summary of the structure inspection survey work is provided in Table 3-4-1 and the tree inspection survey work in Table 3-4-3 in Appendix A.2 – Bats. Results are indicated on Figure 3.1 – 3.6 Bat Roost Potential Survey Results, shown on drawing HA549345-JAJV-EEC-SG-MULTI-DR-GI-0301.

3.4. Badger

Desk Study

3.4.1. Desk study records for badger, returned by GMEU and RECORD, are shown on Figure 2.3 Notable and Protected Species (HA549345-JAJV-EEC-SG-MULTI-DR-GI-0203).

3.4.2. GMEU provided fifty-five recent records[33] for badger and three for badger setts within the study area. The closest records are two records for activity located within the Proposed Scheme. Of these records a total of 15 records comprising 3 field signs, 1 latrine and 11 dead badgers were recorded within 50m of the Proposed Scheme.

Field Surveys

3.4.3. Thirty-two records of badger evidence or features were identified between March and June 2017 within 50m of the Proposed Scheme. This included:

- Twenty-eight setts within 50m of the Proposed Scheme; (six main setts, four outlier setts, nine uncategorised setts, one annexe sett, five inactive setts and three disused setts). Thirteen of these are located within the soft estate, fifteen are within 50m.

[33] Recent records are no more than 10 years old.

- Three latrine sites (sites with numerous dung pits) and one sign of foraging were recorded within the highway soft estate.

3.4.4. A summary of the survey work is provided in Table 3-5-1 in Appendix A.3 – Badgers. Results are indicated on Figure 4.1 – 4.6 Badger Survey Results, shown in drawing HA549345-JAJV-EEC-SG-MULTI-DR-GI-0401.

3.5. Otter

Desk Study

3.5.1. Desk study records for otter, returned by GMEU and RECORD, are shown Figure 2.3 Notable and Protected Species (HA549345-JAJV-EEC-SG-MULTI-DR-GI-0203).

3.5.2. GMEU and RECORD provided four records for otter within 1km of the Proposed Scheme (including outfalls).

3.5.3. Otter has been previously recorded within the Proposed Scheme on the River Bollin and approximately 800m, 880m and 920m to the south of the Proposed Scheme, surrounding Rostherne Mere.

Field Surveys

3.5.4. Six watercourses were identified between April and May 2017 within 50m of the Proposed Scheme (including outfalls). A summary of the survey work is provided in Table 3-6-1 attached at Appendix A.4 – Otter and Water Vole. Both sets of results are indicated on Figure 5.1 – 5.6 Otter/ Water Vole/ White-clawed Crayfish Survey Results, shown on drawing HA549345-JAJV-EEC-SG-MULTI-DR-GI-0501.

3.5.5. Three of the six watercourses were deemed to be suitable habitat for otter and two unsuitable after an initial habitat suitability survey. Those suitable were; the River Bollin, a River Bollin drain (7-GCN-22) and Birkin Brook. These watercourses were deemed suitable due to a number of reasons, including whether the banks were accessible or had overhanging and tree roots within the bank.

3.5.6. The River Bollin drain (7-GCN-10) was considered unsuitable for otter as it was a minor watercourse with, little flow, limited potential for prey and lay up opportunities were limited. Lambs Covert Brook was considered unsuitable as it was dry at the time of survey.

3.5.7. Sutts Hollow Brook could not be surveyed on either survey due to access restrictions.

3.5.8. The three watercourses with suitable otter habitat were revisited in September 2017. Suitability remained consistent with that observed during the initial habitat suitability survey.

3.5.9. Otter presence was confirmed on one watercourse (River Bollin) in September 2017 through identification of field signs including spraints, footprints and feeding remains. No resting or breeding evidence (lay-ups/holts) was identified within 50m of the Proposed Scheme footprint (including outfalls).

3.6. Water Vole

Desk Study

3.6.1. Desk study records for water vole, returned by GMEU and RECORD, are shown Figure 2.3 Notable and Protected Species, (HA549345-JAJV-EEC-SG-MULTI-DR-GI-0203).

3.6.2. GMEU and RECORD provided two records for water vole within 1km of the Proposed Scheme.

3.6.3. Water vole has been previously recorded at approximately 720m and 800m to the south of the Proposed Scheme, surrounding Rostherne Mere.

Field Surveys

3.6.4. Six watercourses were identified between April and May 2017 within 50m of the Proposed Scheme (including outfalls). A summary of the survey work is provided in Table 3-6-1 attached at Appendix A.4 – Otter and Water Vole. Both sets of results are indicated on Figure 5.1 – 5.6 Otter/ Water Vole/ White-clawed Crayfish Survey Results, shown on drawing HA549345-JAJV-EEC-SG-MULTI-DR-GI-0501.

3.6.5. Two watercourses were deemed suitable habitat for use by water vole and three unsuitable after an initial habitat suitability survey based on bank profile, feeding resource and water quality. Those suitable were; the River Bollin and Birkin Brook. Those unsuitable were; River Bollin drain (7-GCN-22), River Bollin drain (7-GCN-10) and Lambs Covert Brook.

3.6.6. Sutts Hollow Brook could not be surveyed due to access restrictions.

3.6.7. The two watercourses with suitable water vole habitat were revisited in September 2017. Suitability remained consistent with that observed during the initial habitat suitability survey. No water vole evidence including burrows, feeding remains and latrines was recorded.

3.7. White-clawed Crayfish

Desk Study

3.7.1. GMEU and RECORD provided no recent records[34] or historical records for white-clawed crayfish within the study area.

Field Surveys

3.7.2. Six watercourses were identified between April and May 2017 within 50m of the Proposed Scheme (including outfalls). A summary of the survey work is provided in Table 3-7-1 attached at Appendix A.5 – White-clawed Crayfish, and are indicated on Figure 5.1 – 5.6 Otter/ Water Vole/ White-clawed Crayfish Survey Results, shown on drawing HA549345-JAJV-EEC-SG-MULTI-DR-GI-0501.

3.7.3. Five of the watercourses were deemed unsuitable habitat for use by White-clawed crayfish after an initial habitat suitability survey due to poor water quality and/ or a lack of suitable habitats. The remaining watercourse, 'Sutts Hollow Brook', could not be surveyed due to access restrictions.

3.8. Reptiles

Desk Study

3.8.1. GMEU and RECORD provided no recent records[35] or historical records for reptiles within the study area.

Field Surveys

3.8.2. No evidence of common and widespread species of reptile was recorded during the broad habitat surveys, between March and June 2017. Overall the habitats on site are considered suitable for

[34] Recent records are no more than 10 years old.
[35] Recent records are no more than 10 years old.

common species of reptile. The various areas of tall ruderal vegetation and the woodland / scrub marginal habitats located throughout the study area are considered to be of most value to common species of reptile. Although some areas are less favourable for reptiles such as broadleaved woodland the marginal habitat are suitable and therefore suitable habitats are present throughout the scheme.

3.8.3. However, as a specific survey targeting common species of reptile was not undertaken, the potential presence of reptiles within the Site cannot be completely ruled-out.

3.9. Nesting Birds

Desk Study

3.9.1. GMEU and RECORD provided 1,507 recent records of notable bird species including 75 records of peregrine (*Falco peregrinus*) and 7 for barn owl (*Tyto alba*) within 1km of the Proposed Scheme. Both species are protected under Schedule 1 of the Wildlife and Countryside Act (1981). These records included 80 different species. These records are shown in Figure 2.3 Notable and Protected Species, shown on drawing HA549345-JAJV-EEC-SG-MULTI-DR-GI-0203.

Field Surveys

3.9.2. No nesting bird evidence was recorded during the broad habitat surveys, between March and June 2017. However, the terrestrial habitats throughout the Proposed Scheme's study area are considered likely to support common species of nesting birds. Key habitats for common species of nesting bird present on the site include woodland, scrub, ruderal and shrub, although common species of birds may nest anywhere within the site. The Site, overall, is not considered to have any significant value for birds.

4. Recommendations for Further Survey

4.1. Great Crested Newt

4.1.1. Additional survey work is required in 2018 to inform the OEMP for the Proposed Scheme and any avoidance, mitigation or licensing requirements. Waterbodies requiring further assessment are summarised in Table 4.1.1 below. The two waterbodies that returned positive eDNA results in 2017 will require further survey and population size class assessments in 2018 if it is considered likely that the proposed works could cause offences with relation to great crested newt. The waterbody that returned an inconclusive eDNA result will require a repeat eDNA survey in 2018. The 2018 eDNA survey must be carried out as early as possible (16 April 2018) to allow time for population class size assessments, if the waterbodies return a positive result. The five waterbodies that returned negative eDNA results in 2017 will not require further survey.

4.1.2. The three waterbodies that were scoped in for HSI survey but could not be accessed will be subject to a HSI assessment in 2018. Access arrangements will be made well in advance of the survey period for great crested newt to ensure surveyors can visit the ponds. The twenty-eight waterbodies, plus the additional aforementioned waterbodies if deemed suitable, that underwent a HSI survey but did not undergo an eDNA survey should be subject to a reattempt of eDNA surveys. The 2018 eDNA surveys must be carried out as early as possible (16th April 2018) to allow time for population class size assessments, if the waterbodies return a positive result. These ponds are located within 250m of the Proposed Scheme or have suitable connectivity to the soft estate.

4.1.3. When determining the requirements for population class size surveys, consideration will be given to the potential risk of an offence being committed under the legislation that would otherwise require a licence. The scope of survey work shall accord with that required to obtain a licence, where necessary.

Table 4-1-1 Waterbodies Requiring Further Assessment

Waterbody Ref.	Approximate distance from HE boundary[36] (m)	Survey requirements 2018
7-GCN-019	See 7-GCN-90	See 7-GCN-90
7-GCN-024a	90	Re-attempt presence/absence survey.
7-GCN-026	61	HSI and eDNA surveys required in 2018.
7-GCN-028	97	Re-attempt presence/absence survey.
7-GCN-028a	73	Re-attempt presence/absence survey.
7-GCN-028b	103	Re-attempt presence/absence survey.
7-GCN-028c	85	Re-attempt presence/absence survey.
7-GCN-034a	5	Re-attempt presence/absence survey.
7-GCN-035	139	Re-attempt presence/absence survey.
7-GCN-051	54	Re-attempt presence/absence survey.
7-GCN-052	63	Re-attempt presence/absence survey.
7-GCN-055	70	Re-attempt presence/absence survey.
7-GCN-056	78	Re-attempt presence/absence survey.
7-GCN-057	62	Re-attempt presence/absence survey.

[36] Highway boundary refers to Highway England boundary fence

Waterbody Ref.	Approximate distance from HE boundary[36] (m)	Survey requirements 2018
7-GCN-058	67	Re-attempt presence/absence survey.
7-GCN-061	83	Re-attempt presence/absence survey.
7-GCN-083	53	GCN present. Population size class estimate surveys are required in 2018
7-GCN-084	91	HSI and eDNA surveys required in 2018.
7-GCN-084a	108	HSI and eDNA surveys required in 2018.
7-GCN-086	4	Re-attempt presence/absence survey.
7-GCN-087	See 7-GCN-90	Re-attempt presence/absence survey.
7-GCN-090	18	Re-attempt presence/absence survey.
7-GCN-091	See 7-GCN-90	Re-attempt presence/absence survey.
7-GCN-093	31	Re-attempt presence/absence survey.
7-GCN-097	150	Re-attempt presence/absence survey.
7-GCN-098a	229	Re-attempt presence/absence survey.
7-GCN-099	246	Re-attempt presence/absence survey.
7-GCN-100 & 7-GCN-101	73	Presence/absence results to be obtained from previous survey effort.
7-GCN-103	165	Re-attempt presence/absence survey.
7-GCN-104	67	Presence/absence results to be obtained from previous survey effort.
7-GCN-106	276	Re-attempt presence/absence survey.
7-GCN-108	40	Presence/absence results to be obtained from previous survey effort.
7-GCN-108a	1	Presence/absence results to be obtained from previous survey effort.
7-GCN-108b	3	Re-attempt presence/absence survey.
7-GCN-110a	225	Re-attempt presence/absence survey.
7-GCN-115	62	Re-attempt presence/absence survey.
7-GCN-117	51	Re-attempt presence/absence survey.
7-GCN-118	74	Re-attempt presence/absence survey.
7-GCN-118a	117	Re-attempt presence/absence survey.
7-GCN-119	78	Re-attempt presence/absence survey.
7-GCN-119a	80	Re-attempt presence/absence survey.
7-GCN-119b	65	Re-attempt presence/absence survey.
7-GCN-120	82	Re-attempt presence/absence survey.
7-GCN-133 / 7-GCN-12	72	GCN present. Population size class estimate surveys are required in 2018
7-GCN-135	101	Re-attempt presence/absence survey.
7-GCN-135a	115	Re-attempt presence/absence survey.

4.1.4. Where eDNA confirms great crested newt presence and the pond lie within 250m of any proposed works then population size class assessments will be undertaken in accordance with the Great Crested Newt Conservation Guidelines[37]. A minimum of six survey visits are required

[37] Great Crested Newt Mitigation Guidelines (English Nature, 2001)

between mid-March and mid-June with at least three of the surveys undertaken between mid-April and mid-May.

4.1.5. The following standard survey techniques will be used to give an indication of whether a population is small, medium or large in terms of the number of adult newts present in the breeding water body:

- Torching: Walking the circumference of each water body and shining a high-powered torch (one million candlepower) into the water to record the number of great crested newts (and other amphibian species) present; and
- Bottle Trapping: Placing specifically made bottle traps around the margins of each water body. The traps should be set late in the evening and then retrieved early the following morning. Any trapped great crested newts (and other amphibian species) should be counted and sexed.

4.1.6. Using the maximum count of individuals observed in one survey night, (using the count from the highest scoring method only) over the six surveys, a population size class estimate is made: Small population (up to ten individuals); medium population (ten to one hundred individuals), and; large population (over one hundred individuals).

4.1.7. In 2016 Natural England published four new policies in relation to European Protected Species (EPS), as detailed below:

- **Policy 1 – Greater flexibility when excluding and relocating EPS from development sites:** exclusion or relocation measures are not necessary to maintain the conservation status of the local population; the 'avoid-mitigate-compensate' hierarchy is followed; and compensation provides greater benefits to the local population than would exclusion and/or relocation.
- **Policy 2 – Greater flexibility in the location of newly created habitats that compensate for habitats that will be lost:** If the licensing tests are met and the avoid-mitigate-compensate hierarchy is followed, off-site compensation measures may be preferred to on-site compensation measures, where there are good reasons for maximising development on the site of EPS impacts, and where an off-site solution provides greater benefit to the local population than an on-site solution.
- **Policy 3: Allowing EPS to have access to temporary habitats that will be developed at a later date:** Where development (such as mineral extraction) will temporarily create habitat which is likely to attract EPS, Defra favours proposals which enable works to proceed without the exclusion of EPS, where the conservation status of the local population would not be detrimentally affected. On completion of development such sites must contribute to the conservation status of the local population as much as or more than the land use which preceded development. The measures to achieve this should be set out in a management plan and secured by a legal agreement.
- **Policy 4: Appropriate and relevant surveys where the impacts of development can be confidently predicted:** Natural England will be expected to ensure that licensing decisions are properly supported by survey information, considering industry standards and guidelines. It may, however, accept a lower than standard survey effort where: the costs or delays associated with carrying out standard survey requirements would be disproportionate to the additional certainty that it would bring; the ecological impacts of development can be predicted with sufficient certainty; and mitigation or compensation will ensure that the licensed activity does not detrimentally affect the conservation status of the local population of any EPS.

4.1.8. Where the results of the surveys indicate that an impact on great crested newts may occur consideration will be given to the Natural England polices listed above.

4.2. Bats

4.2.1. Additional survey work is required in 2018 to inform the OEMP for the Proposed Scheme, avoidance measures, mitigation and any licensing requirements. If work to the eleven structures identified as being suitable for roosting bats is likely to disturb any potential roosting bats, emergence/ re-entry surveys will be carried out, where considered necessary. If work to the two structures that could not be surveyed due to access restriction is likely to disturb any potential roosting bats, detailed inspection of the specific structures will take place prior to works, and emergence/re-entry surveys will be carried out, where considered necessary. All surveys will be undertaken in accordance with Bat Conservation Trust guidelines. Survey effort will be carried out in line with the specific structure's assigned bat roosting potential, shown in Table 3-4-1 (Appendix A.2).

4.2.2. During the walkover surveys sixty-three trees were identified as having bat roosting potential. Once the Proposed Scheme design is fixed and the proposed working methods are known those trees with bat roosting potential which could be impacted by the proposed works (should bats be present) will be subject to further survey and assessment. Detailed inspections by tree climbers or ladders and/or an endoscope, is required where the proposed works may have an impact on bat roosts should they be present within these trees. Following further inspection emergence/re-entry surveys will be carried out, where trees are likely to be impacted by the proposed works. Survey effort will be carried out in line with the specific tree's assigned bat roosting potential, shown in Table 3-4-2 (Appendix A.2). Trees confirmed to have low bat roost potential after a detailed inspection will not require further survey, but will require soft felling under a precautionary method of working. Trees with moderate or high bat roosting potential will require presence/absence or roost characterisation surveys will be required.

4.2.3. As it has not been possible to access the entirety of the soft estate (refer to Figure 3.3 Bat Roost Potential Survey Results) and adjoining land to carry out an assessment of all trees within the footprint of the Proposed Scheme; a detailed inspection of all trees which may be removed or are likely to disturb potential roosting bats will be carried out prior to any clearance of mature or semi-mature trees.

4.2.4. Dusk emergence surveys will be undertaken in the evening approximately thirty minutes before sunset and for a further two hours after sunset. Dawn re-entry surveys will be undertaken approximately ninety minutes before, and continue until sunrise.

Table 4-2-1 Recommended Survey Effort[38]

Likelihood of roost presence	Recommended minimum number of survey visits	Recommended timings
Low	One survey visit, either a dusk emergence or dawn re-entry.	May to August.
	No further surveys required (trees).	N/A
Moderate	Two survey visits, one dusk emergence and a separate dawn re-entry.	May to September, at least one between May and August.
High	Three survey visits, one dusk emergence and a separate dawn re-entry and a third visit which is either a dusk emergence or dawn re-entry.	May to September, at least two surveys between May and August.

[38] Adapted from: Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1

4.3. Badger

4.3.1. Setts which have been identified during walkover surveys which are likely to be subject to potential damage or disturbance as a result of the Proposed Scheme, will be the subject of monitoring and targeted surveys in 2018. Survey will include the use of camera traps over a period of up to four weeks to inform and establish the levels of activity associated with each sett[39]. This monitoring should take place approximately six months prior to the commencement of works to allow time to produce and submit a badger development licence to Natural England, should this be required.

4.3.2. Monitoring surveys will also inform the likelihood of disturbance to badgers at distance which may be caused by activity associated with the works. The following are examples of such activities which would require a licence:

- Use of heavy machinery within 30m of a sett entrance;
- Use of light machinery within 20m of a sett entrance;
- Light work such as hand digging or scrub clearance within 10m of a sett entrance.

4.3.3. Where badger setts will be impacted by the proposed works temporary or permanent closure of the sett will be undertaken under licence. Licences are normally only granted by Natural England to permit works that would otherwise cause an offence between July and November inclusive.

4.4. Otter

4.4.1. The three watercourses deemed to provide suitable habitat for otter will require a further survey six months prior to commencement of the works if there is a risk that the Proposed Scheme could have direct or indirect impacts on otters, should they be present. This survey will check for resting sites that may be subject to disturbance during the Proposed Scheme. If an otter holt is discovered within 50m of the Proposed Scheme, and it is considered that the Proposed Scheme will significantly impact otters using the holt, a Natural England development licence for otters may be required.

4.4.2. If the watercourse is not likely to be impacted by any proposed works then further surveys will not be required. However, it is recommended that any works are undertaken with regard to the pollution prevention guidelines (PPGs)[40] and the Construction Industry Research and Information Association (CIRIA) guidance on the control of water pollution from construction sites[41]. These sources outline good practice advice for undertaking works which may have the potential to cause water pollution.

4.4.3. Watercourses deemed to provide unsuitable habitat for otter do not require further survey.

4.4.4. All targeted watercourses were surveyed in 2017 with the exception of 'Sutts Hollow Brook', which was not surveyed due to access restrictions. The watercourse will be surveyed in 2018.

[39] https://www.gov.uk/guidance/badgers-surveys-and-mitigation-for-development-projects#survey-methods

[40] Pollution Prevention Guidelines (PPGs) (with particular reference to PPG1 - general guide to the prevention of water pollution, PPG3 - use and design of oil separators in surface water drainage systems, PPG5 - works near or liable to affect watercourses and PPG6 - working at construction and demolition sites) are a series of documents developed by the Environment Agency for England and Wales. Each PPG is targeted at a particular type of business or activity and covers environmental good practice to minimise pollution. The PPGs also make reference to environmental legal obligations, but are currently out of date and require updating. The PPGs are available from http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/business/topics/pollution/39083.aspx. Alternatively see https://www.gov.uk/guidance/pollution-prevention-for-businesses.

[41] The CIRIA documents are a series of publications developed by the Construction Industry Research and Information Association. Each document is targeted at a particular type of business or activity and covers environmental good practice to minimise pollution. Particular attention should be given to CIRIA C532 (Control of water pollution from construction sites, 2001). The CIRIA publications also make reference to environmental legal obligations and are available from: http://www.ciria.org/CIRIA/Resources/Resource_overview/Resources/Resources_overview.aspx?hkey=a80608d2-a045-4d72-8bb9-5ecf23f8d761"

4.5. Water Vole

4.5.1. The two watercourses deemed to provide suitable habitat for water vole will also require further survey if water vole is likely to be impacted by any proposed works. Surveys should include searches for field signs, as per the initial survey methodology, over at least two separate visits. One visit should be between mid-April/early May and a second should be between July and September[42]. The survey visits should be at least two months apart.

4.5.2. If the watercourse is not likely to be impacted by any proposed works then further surveys will not be required. However, it is, recommended that any works are undertaken with regard to the pollution prevention guidelines (PPGs)[43] and the Construction Industry Research and Information Association (CIRIA) guidance on the control of water pollution from construction sites[44]. These sources outline good practice advice for undertaking works which may have the potential to cause water pollution.

4.5.3. Watercourses deemed to provide unsuitable habitat for water vole do not require further survey.

4.5.4. All targeted watercourses were surveyed in 2017 with the exception of 'Sutts Hollow Brook', which was not surveyed due to access restrictions. Access arrangements will be arranged with the land owner so the watercourse can be surveyed in 2018.

4.6. White-clawed Crayfish

4.6.1. All watercourses surveyed were deemed to provide unsuitable habitat for white-clawed crayfish. Therefore, no further survey is required for these watercourses. It is recommended that any works are undertaken with regard to the pollution prevention guidelines (PPGs) and the Construction Industry Research and Information Association (CIRIA) guidance on the control of water pollution from construction sites. These sources outline good practice advice for undertaking works which may have the potential to cause water pollution.

4.6.2. All targeted watercourses were surveyed in 2017 with the exception of 'Sutts Hollow Brook', which was not surveyed due to access restrictions. The initial assessment survey will be re-attempted in 2018 at this watercourse.

4.7. Reptiles

4.7.1. Potentially suitable habitat for common and widespread British reptile species exists within areas of grassland, scrub and woodland edge in the soft estate and adjacent to the motorway boundary. Current proposals suggest that there will not be any long-term loss of a large area of high quality reptile habitat or any significant habitat fragmentation arising from the works. Therefore, it is not recommended that presence/absence, population or trapping be carried out on this project[45].

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[42] Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. Eds Fiona Matthews and Paul Chanin. The Mammal Society London.

[43] Pollution Prevention Guidelines (PPGs) (with particular reference to PPG1 - general guide to the prevention of water pollution, PPG3 - use and design of oil separators in surface water drainage systems, PPG5 - works near or liable to affect watercourses and PPG6 - working at construction and demolition sites) are a series of documents developed by the Environment Agency for England and Wales. Each PPG is targeted at a particular type of business or activity and covers environmental good practice to minimise pollution. The PPGs also make reference to environmental legal obligations, but are currently out of date and require updating. The PPGs are available from http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/business/topics/pollution/39083.aspx. Alternatively see https://www.gov.uk/guidance/pollution-prevention-for-businesses.

[44] The CIRIA documents are a series of publications developed by the Construction Industry Research and Information Association. Each document is targeted at a particular type of business or activity and covers environmental good practice to minimise pollution. Particular attention should be given to CIRIA C532 (Control of water pollution from construction sites, 2001). The CIRIA publications also make reference to environmental legal obligations and are available from: http://www.ciria.org/CIRIA/Resources/Resource_overview/Resources/Resources_overview.aspx?hkey=a80608d2-a045-4d72-8bb9-5ecf23f8d761"

[45] https://www.gov.uk/guidance/reptiles-protection-surveys-and-licences

4.7.2. However, as the potential presence of reptiles cannot be completely ruled-out, that a precautionary method of working in respect of reptiles should be included within the Outline Environmental Management Plan.

4.8. Nesting Birds

4.8.1. As the site is not considered to have any special ecological value for birds, further surveys for specific species or occurrences of nesting birds are not required.

4.8.2. If vegetation clearance is undertaken during the breeding bird season measures should be included in the Outline Environmental Management Plan to prevent disturbance and destruction of active nests.

Appendix A. Field Survey Results

A.1. Great Crested Newt

Table 3-3-1 Results of the great crested newt surveys and further survey work/ requirements

Waterbody reference	Approximate distance from HE boundary[46] (m)	HSI score 2017	eDNA result 2017	Reason waterbody scoped out / any other comments	Survey Requirements 2018 (subject to confirmed design and likely impacts)
7-GCN-001	490	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-002	475	N/A		Scoped out due to distance from scheme	
7-GCN-003	455	N/A		Scoped out due to distance from scheme	
7-GCN-004	390	N/A		Scoped out due to distance from scheme	
7-GCN-005	290	N/A		Scoped out due to distance from scheme	
7-GCN-006	252	N/A	-	Flowing drain. Ruled out.	Scoped out after HSI – no further survey required.
7-GCN-007	380	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-008	136	N/A	-	Flowing drain. Ruled out.	Scoped out after HSI – no further survey required.
7-GCN-009	34	N/A	-	Flowing water	Scoped out after HSI – no further survey required.
7-GCN-010	30	N/A	-	Flowing water	Scoped out after HSI – no further survey required.
7-GCN-011	98	N/A	-	Flowing water	Scoped out after HSI – no further survey required.
7-GCN-012a	177	Excellent	Negative	GCN assumed absent	GCN assumed absent. No further survey required.
7-GCN-013	148	N/A	-	Flowing water	Scoped out after HSI – no further survey required.
7-GCN-014	6	N/A	-	Dry ditch	Scoped out after HSI – no further survey required.
7-GCN-015	16	N/A	-	Pool at eastern end surveyed only. Flow identified at western end.	Scoped out after HSI – no further survey required.
7-GCN-015a	142	N/A	-	Dry at time of survey	Scoped out after HSI – no further survey required.

[46] Highway boundary is taken to be the Highways England boundary fence

Waterbody reference	Approximate distance from HE boundary[46] (m)	HSI score 2017	eDNA result 2017	Reason waterbody scoped out / any other comments	Survey Requirements 2018 (subject to confirmed design and likely impacts)
7-GCN-016	4	N/A	-	Dry ditch	Scoped out after HSI – no further survey required.
7-GCN-017	32	N/A	-	Dry ditch	Scoped out after HSI – no further survey required.
7-GCN-018	48	N/A	-	Boggy ground not suitable for GCN	Scoped out after HSI – no further survey required.
7-GCN-019	See 7-GCN-90	Excellent. See 7-GCN-90	Scoped in – not surveyed due to access restrictions.	Scoped in – not surveyed due to access restrictions. Ponds 7-GCN-19, 87, 90, 91 all connected, see 7-GCN-90 for HSI.	See 7-GCN-90
7-GCN-020	48	N/A	-	A drain that flows into river	Scoped out after HSI – no further survey required
7-GCN-021	13	N/A	-	Dry ditch	Scoped out after HSI – no further survey required
7-GCN-022	26	N/A	-	Flowing water	Scoped out after HSI – no further survey required
7-GCN-023	168	N/A	-	Flowing water	Scoped out after HSI – no further survey required
7-GCN-024	7	N/A	-	Dry drain	Scoped out after HSI – no further survey required
7-GCN-024a	90	Poor	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-025	7	N/A	-	Dry drain	Scoped out after HSI – no further survey required
7-GCN-026	61	Scoped in – not surveyed due to access restrictions	-	Scoped in – not surveyed due to access restrictions	HSI and eDNA surveys required in 2018.
7-GCN-027	13	N/A	-	Flowing water	Scoped out after HSI – no further survey required
7-GCN-028	97	Below average	-	Found to be dry at time of eDNA survey.	Re-attempt presence/absence survey.
7-GCN-028a	73	Poor	-	Found to be dry at time of eDNA survey.	Re-attempt presence/absence survey.
7-GCN-028b	103	Below average	-	Found to be dry at time of eDNA survey.	Re-attempt presence/absence survey.

Waterbody reference	Approximate distance from HE boundary[46] (m)	HSI score 2017	eDNA result 2017	Reason waterbody scoped out / any other comments	Survey Requirements 2018 (subject to confirmed design and likely impacts)
7-GCN-028c	85	Poor	-	Found to be dry at time of eDNA survey.	Re-attempt presence/absence survey.
7-GCN-028d	56	N/A	-	Dry at time of survey	Scoped out after HSI – no further survey required
7-GCN-028e	68	N/A	-	Dry at time of survey	Scoped out after HSI – no further survey required
7-GCN-029	91	N/A	-	Wetland area not suitable for GCN	Scoped out after HSI – no further survey required
7-GCN-030	98	N/A	-	Dry ditch	Scoped out after HSI – no further survey required
7-GCN-031/31a	67	N/A	-	Dry ditch	Scoped out after HSI – no further survey required
7-GCN-032	121	N/A	-	Flowing water	Scoped out after HSI – no further survey required
7-GCN-032a	120	N/A	-	Small beck with flow	Scoped out after HSI – no further survey required
7-GCN-033	80	N/A	-	Flowing water	Scoped out after HSI – no further survey required
7-GCN-034	23	N/A	-	Dry at time of survey	Scoped out after HSI – no further survey required
7-GCN-034a	5	Poor	-	Found to be dry at time of eDNA survey.	Re-attempt presence/absence survey.
7-GCN-035	139	Below average	-	Physically difficult to access at time of eDNA survey. No access as steep concrete drain.	Re-attempt presence/absence survey.
7-GCN-036	39	N/A	-	Dry at time of survey	Scoped out after HSI – no further survey required
7-GCN-37	220	N/A		Scoped out due to barriers to movement	
7-GCN-038	158	N/A	-	Flowing water	Scoped out after HSI – no further survey required
7-GCN-40	230	N/A		Scoped out due to barriers to movement	
7-GCN-41	310	N/A		Scoped out due to distance from scheme and barriers to movement	

Waterbody reference	Approximate distance from HE boundary[46] (m)	HSI score 2017	eDNA result 2017	Reason waterbody scoped out / any other comments	Survey Requirements 2018 (subject to confirmed design and likely impacts)
7-GCN-42	400	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-43	410	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-44	420	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-45	385	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-046	234	N/A	-	Flowing water	Scoped out after HSI – no further survey required
7-GCN-47	450	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-48	450	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-49	490	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-50	435	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-051	54	Average. See 7-GCN-120	-	Part of a large network of connected ponds and ditches including 7-GCN-115,117,118,119,120,121, 51,52,55,56,57,58,61. See 120 for HSI score.	Re-attempt presence/absence survey.
7-GCN-052	63	Average. See 7-GCN-120	-	Part of a large network of connected ponds and ditches including 7-GCN-115,117,118,119,120,121, 51,52,55,56,57,58,61. See 120 for HSI score.	Re-attempt presence/absence survey.
7-GCN-53	300	N/A		Scoped out due to distance from scheme	
7-GCN-54	300	N/A		Scoped out due to distance from scheme	

Waterbody reference	Approximate distance from HE boundary[46] (m)	HSI score 2017	eDNA result 2017	Reason waterbody scoped out / any other comments	Survey Requirements 2018 (subject to confirmed design and likely impacts)
7-GCN-055	70	Average. See 7-GCN-120	-	Part of a large network of connected ponds and ditches including 7-GCN-115,117,118,119,120,121, 51,52,55,56,57,58,61. See 120 for HSI score.	Re-attempt presence/absence survey.
7-GCN-056	78	Average. See 7-GCN-120	-	Part of a large network of connected ponds and ditches including 7-GCN-115,117,118,119,120,121, 51,52,55,56,57,58,61. See 120 for HSI score.	Re-attempt presence/absence survey.
7-GCN-057	62	Average. See 7-GCN-120	-	Part of a large network of connected ponds and ditches including 7-GCN-115,117,118,119,120,121, 51,52,55,56,57,58,61. See 120 for HSI score.	Re-attempt presence/absence survey.
7-GCN-058	67	Average. See 7-GCN-120	-	Part of a large network of connected ponds and ditches including 7-GCN-115,117,118,119,120,121, 51,52,55,56,57,58,61. See 120 for HSI score.	Re-attempt presence/absence survey.
7-GCN-59	225	N/A		Dry – Scoped out	
7-GCN-60	240	N/A		Dry – Scoped out	
7-GCN-061	83	Average. See 7-GCN-120	-	Part of a large network of connected ponds and ditches including 7-GCN-115,117,118,119,120,121, 51,52,55,56,57,58,61. See 120 for HSI score.	Re-attempt presence/absence survey.
7-GCN-62	315	N/A	-	Scoped out due to distance from scheme and barriers to movement	
7-GCN-63	500	N/A		Scoped out due to distance from scheme	

Waterbody reference	Approximate distance from HE boundary[46] (m)	HSI score 2017	eDNA result 2017	Reason waterbody scoped out / any other comments	Survey Requirements 2018 (subject to confirmed design and likely impacts)
7-GCN-64	485	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-65	420	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-66	475	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-67	390	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-68	380	N/A		Scoped out due to distance from scheme	
7-GCN-69	405	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-70	320	N/A		Scoped out due to distance from scheme	
7-GCN-71	300	N/A		Scoped out due to distance from scheme	
7-GCN-072	217	Excellent	Negative	GCN assumed absent	GCN assumed absent. No further survey required.
7-GCN-073	222	N/A	-	Dry ditch as part of a larger network. Linked to 7-GCN-72	Scoped out after HSI – no further survey required
7-GCN-074	216	N/A	-	Dry ditch as part of a larger network. Linked to 7-GCN-73	Scoped out after HSI – no further survey required
7-GCN-075	215	Good	Negative	GCN assumed absent	GCN assumed absent. No further survey required.
7-GCN-76	345	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-77	460	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-78	460	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-079	284	N/A	-	Flowing water	Scoped out after HSI – no further survey required
7-GCN-80	365	N/A		Scoped out due to distance from scheme	

Waterbody reference	Approximate distance from HE boundary[46] (m)	HSI score 2017	eDNA result 2017	Reason waterbody scoped out / any other comments	Survey Requirements 2018 (subject to confirmed design and likely impacts)
7-GCN-81	360	N/A		Scoped out due to distance from scheme	
7-GCN-082a	193	N/A	-	Dry/Not present	Scoped out after HSI – no further survey required
7-GCN-083	53	Good	Positive	GCN present	GCN present. Population size class estimate surveys are required in 2018
7-GCN-084	91	Scoped in – not surveyed due to access restrictions	-	Scoped in – no HSI or eDNA surveys due to access restrictions	HSI and eDNA surveys required in 2018.
7-GCN-084a	108	Scoped in – not surveyed due to access restrictions	-	Scoped in – no HSI or eDNA surveys due to access restrictions	HSI and eDNA surveys required in 2018.
7-GCN-85	430	N/A		Scoped out due to distance from scheme	
7-GCN-086	4	Good	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-087	See 7-GCN-90	Excellent. See 7-GCN-90	Scoped in – not surveyed due to access restrictions.	Scoped in – not surveyed due to access restrictions. Part of a connected network of ponds 7-GCN-19, 87, 90, 91. See 7-GCN-90 for HSI.	Re-attempt presence/absence survey.
7-GCN-88	270	N/A		Scoped out due to distance from scheme	
7-GCN-089	5	N/A	-	Dry at time of survey	Scoped out after HSI – no further survey required
7-GCN-090	18	Excellent	Scoped in – not surveyed due to access restrictions.	Scoped in – not surveyed due to access restrictions. Part of a connected network of ponds 7-GCN-19, 87, 91.	Re-attempt presence/absence survey.

Waterbody reference	Approximate distance from HE boundary[46] (m)	HSI score 2017	eDNA result 2017	Reason waterbody scoped out / any other comments	Survey Requirements 2018 (subject to confirmed design and likely impacts)
7-GCN-091	See 7-GCN-90	Excellent. See 7-GCN-90	Scoped in – not surveyed due to access restrictions.	Scoped in – not surveyed due to access restrictions. Part of a connected network of ponds 7-GCN-19, 87, 90, 91. See 7-GCN-90 for HSI.	Re-attempt presence/absence survey.
7-GCN-092	106	N/A	-	Dry at time of survey	Scoped out after HSI – no further survey required
7-GCN-093	31	Good	-	Scoped in – not surveyed due to access restrictions. Likely connected to 7-GCN-19, 87, 90, 91 when water levels higher.	Re-attempt presence/absence survey.
7-GCN-94	395	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-095	91	N/A	-	Wetland area not suitable for GCN	Scoped out after HSI – no further survey required
7-GCN-096	19	Average	Negative	GCN assumed absent	GCN assumed absent – no further survey required
7-GCN-097	150	Below average	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-098a	229	Below average	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-099	246	Below average	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-100 & 7-GCN-101	73	Excellent	Conventional presence/absence surveys undertaken. No great crested newts found.	Does not require eDNA as these results will be obtained from previous survey effort.	Presence/absence results to be obtained from previous survey effort.
7-GCN-102	400	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-103	165	Average	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.

Waterbody reference	Approximate distance from HE boundary[46] (m)	HSI score 2017	eDNA result 2017	Reason waterbody scoped out / any other comments	Survey Requirements 2018 (subject to confirmed design and likely impacts)
7-GCN-104	67	Average	Conventional presence/absence surveys undertaken. No great crested newts found.	Does not require eDNA as these results will be obtained from previous survey effort.	Presence/absence results to be obtained from previous survey effort.
7-GCN-105	138	N/A	-	Dry at time of survey	Scoped out after HSI – no further survey required
7-GCN-105a	96	N/A	-	Dry at time of survey	Scoped out after HSI – no further survey required
7-GCN-106	276	Average	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-107	285	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-108	40	Good	Conventional presence/absence surveys undertaken. No great crested newts found.	Does not require eDNA as these results will be obtained from previous survey effort.	Presence/absence results to be obtained from previous survey effort.
7-GCN-108a	1	Average	Conventional presence/absence surveys undertaken. No great crested newts found.	Does not require eDNA as these results will be obtained from previous survey effort.	Presence/absence results to be obtained from previous survey effort.
7-GCN-108b	3	Average	Presence/absence results were to be obtained from previous survey effort but this	Does not require eDNA as these results will be obtained from previous survey effort.	Re-attempt presence/absence survey.

Waterbody reference	Approximate distance from HE boundary[46] (m)	HSI score 2017	eDNA result 2017	Reason waterbody scoped out / any other comments	Survey Requirements 2018 (subject to confirmed design and likely impacts)
			pond was dry at the time previous surveys were undertaken.		
7-GCN-109	410	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-110a	225	Poor	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-111	375	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-112	450	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-113	490	N/A		Scoped out due to distance from scheme and barriers to movement	
7-GCN-114	405	N/A		Scoped out due to distance from scheme and poor connectivity	
7-GCN-115	62	Excellent	-	Part of a large network of connected ponds and ditches including 7-GCN-115,117,118,119,120,121, 51,52,55,56,57,58,61. See 120 for HSI score. Scoped in – not surveyed due to access restrictions.	Re-attempt presence/absence survey.
7-GCN-116	440	N/A		Scoped out due to distance from scheme and poor connectivity	
7-GCN-117	51	Excellent	-	Part of a large network of connected ponds and ditches including 7-GCN-115,117,118,119,120,121, 51,52,55,56,57,58,61. Scoped in – not surveyed due to access restrictions.	Re-attempt presence/absence survey.

Waterbody reference	Approximate distance from HE boundary[46] (m)	HSI score 2017	eDNA result 2017	Reason waterbody scoped out / any other comments	Survey Requirements 2018 (subject to confirmed design and likely impacts)
7-GCN-118	74	Excellent	-	Part of a large network of connected ponds and ditches including 7-GCN-115,117,118,119,120,121, 51,52,55,56,57,58,61. Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-118a	117	Good	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-119	78	Good	-	Part of a large network of connected ponds and ditches including 7-GCN-115,117,118,119,120,121, 51,52,55,56,57,58,61. Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-119a	80	Below average	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-119b	65	Below average	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-120	82	Average	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-121	64	Good	-	Part of a large network of connected ponds and ditches including 7-GCN-115,117,118,119,120,121, 51,52,55,56,57,58,61. Scoped in – not surveyed due to access restrictions.	Scoped out after HSI – no further survey required
7-GCN-122	100	N/A	-	Not a pond	Scoped out after HSI – no further survey required
7-GCN-123	103	N/A	-	Not a pond	Scoped out after HSI – no further survey required
7-GCN-124	320	N/A	-	Scoped out due to distance from scheme	
7-GCN-125	56	Average	Negative	-	GCN assumed absent. No further surveys required
7-GCN-126	305	N/A	-	Scoped out due to distance from scheme and barriers to movement	

Waterbody reference	Approximate distance from HE boundary[46] (m)	HSI score 2017	eDNA result 2017	Reason waterbody scoped out / any other comments	Survey Requirements 2018 (subject to confirmed design and likely impacts)
7-GCN-127	390	N/A	-	Scoped out due to distance from scheme and barriers to movement	
7-GCN-128	340	N/A		Scoped out due to distance from scheme	
7-GCN-129	450	N/A	-	Scoped out due to distance from scheme and barriers to movement	
7-GCN-130	390	N/A		Scoped out due to distance from scheme	
7-GCN-131	540	N/A	-	Scoped out due to distance from scheme	
7-GCN-132	88	N/A	-	Pond no longer present	Scoped out after HSI – no further survey required
7-GCN-133 / 7-GCN-12	72	Excellent	Positive	Pond 7-GCN-12 and 133 are connected and were assessed as one	GCN present. Population size class estimate surveys are required in 2018
7-GCN-134	465			Scoped out due to distance from scheme and barriers to movement	
7-GCN-135	101	Poor	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.
7-GCN-135a	115	Poor	-	Scoped in – not surveyed due to access restrictions	Re-attempt presence/absence survey.

A.2. Bats

Table 3-4-1 Structure Bat Survey Results March 2017 to June 2017

Structure Name	Structure Number	Overbridge / Underbridge / Tree	Bat Roost Potential	Comments	Further survey requirements (subject to confirmed design and likely impacts)
Hasty Lane Subway	/M56//13.70//	Underbridge	Negligible	-	Scoped out - further survey not required
Wilmslow Road	6/M56//14.10//	Underbridge	Moderate	-	Two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
Chapel Lane	/M56//15.00//	Overbridge	Moderate	-	Two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
River Bollin	/M56//15.50//	Underbridge	High	-	Three survey visits, one dusk emergence and a separate dawn re-entry and a third visit which is either a dusk emergence or dawn re-entry. May to September, at least two surveys between May and August
Thornsgreen	/M56//15.70//	Overbridge	High	-	Three survey visits, one dusk emergence and a separate dawn re-entry and a third visit which is either a dusk emergence or dawn re-entry. May to September, at least two surveys between May and August
River Bollin Trib Culvert	-	Underbridge	-	Not surveyed due to access restrictions	Inspection for bat roosting potential in 2018 and further survey if required
Castle Mill Lane	/M56//16.70//	Overbridge	Moderate	-	Two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
Cow Lane	/M56//17.10//	Underbridge	High	-	Three survey visits, one dusk emergence and a separate dawn re-entry and a third visit which is either a dusk emergence or dawn re-entry. May to September, at least two surveys between May and August

Structure Name	Structure Number	Overbridge / Underbridge / Tree	Bat Roost Potential	Comments	Further survey requirements (subject to confirmed design and likely impacts)
Ashley Railway	/M56//17.40//	Underbridge	Moderate	-	Two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
Ashley Hall Road	/M56//17.70//	Overbridge	-	Not surveyed due to access restrictions	Inspection for bat roosting potential in 2018 and further surveys if required.
Ryecroft Footbridge	/M56//18.90//	Overbridge	Low	-	One survey visit, either a dusk emergence or dawn re-entry. From May to August.
Birkin Culvert	/M56//19.30/Q/	Culvert	Negligible	-	Scoped out - further survey not required
Bowdon View	7/M56//19.70//	Overbridge	Low	-	One survey visit, either a dusk emergence or dawn re-entry. From May to August.
Yarwood Heath Lane	7/M56//20.20//	Overbridge	Moderate	-	two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
Chester Road Bridge	/A556//29.70//	Overbridge	Low	-	One survey visit, either a dusk emergence or dawn re-entry. From May to August.

Table 3-4-2 Tree Bat Survey Results March 2017 to June 2017

Tree Name	Grid Reference	Notes	Bat Roost Potential	Further survey requirements (subject to confirmed design and likely impacts)
1	SJ 80345 84917	Turkey Oak. Edge of arable field bordering soft estate. Surrounded by hedgerow and ponds.	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August

Tree Name	Grid Reference	Notes	Bat Roost Potential	Further survey requirements (subject to confirmed design and likely impacts)
2	SJ 80171 84966	Very mature oak with multiple dead limbs and bark fissures all the way up	Low	Detailed inspection.
3	SJ 80154 84928	Mature oak with several potential roosting features. Knot hole that has split down trunk. Cavity in trunk.	High	Detailed inspection if possible. If not possible, three survey visits, one dusk emergence and a separate dawn re-entry and a third visit which is either a dusk emergence or dawn re-entry. May to September, at least two surveys between May and August
4	SJ 80130 84888	Mature ash. Ivy clad with possible other features obscured by vegetation.	Low	Detailed inspection.
5	SJ 80091 84757	Turkey oak.	Low	Detailed inspection.
6	SJ 80095 84734	Alder	Low	Detailed inspection.
7	SJ 79974 84773	Oak	High	Detailed inspection if possible. If not possible, three survey visits, one dusk emergence and a separate dawn re-entry and a third visit which is either a dusk emergence or dawn re-entry. May to September, at least two surveys between May and August
8	SJ 79627 84642	Oak. 2 limbs about 4m up with potential holes for opportunistic day roost.	Low	Detailed inspection.
9	SJ 79548 84554	Mature Ash with long split along bough	Low	Detailed inspection.
10	SJ 79550 84550	Mature ash on wooded slope leaning toward culvert. Dense Ivy cladding. And split bough	Low	Detailed inspection.
11	SJ 79542 84550	Large mature ash with few lower branches at bottom of bank	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
12	SJ 79517 84537	Mature ash on wooded slope. Dense Ivy cladding	Low	Detailed inspection.

Tree Name	Grid Reference	Notes	Bat Roost Potential	Further survey requirements (subject to confirmed design and likely impacts)
13	SJ 79504 84530	Mature oak standing alone on bank	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
14	SJ 79548 84523	Semi Mature sycamore at top of wooded slope near stream. Knit hole on northern aspect.	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
15	SJ 79522 84516	Mature ash on wooded slope near stream. Dense Ivy cladding	Low	Detailed inspection.
16	SJ 79333 84578	Oak with Ivy cladding	Low	Detailed inspection.
17	SJ 79333 84578	Oak with Ivy cladding	Low	Detailed inspection.
18	SJ 79333 84578	Ash with Ivy cladding	Low	Detailed inspection.
19	SJ 79333 84578	Ash with Ivy cladding	Low	Detailed inspection.
20	SJ 79256 84599	Mature oak with ivy cladding and a number of dead limbs, higher ones obscured	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
21	SJ 79165 84579	Very tall mature oak 1m outside field	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
22	SJ 79053 84496	Scot's Pine	Low	Detailed inspection.
23	SJ 79053 84470	Sycamore	Low	Detailed inspection.
24	SJ 79077 84465	Oak	Low	Detailed inspection.
25	SJ 78545 84623	Ash. Hollow trunk. Split in tree all the way through. Looks hollow upward too.	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August

Tree Name	Grid Reference	Notes	Bat Roost Potential	Further survey requirements (subject to confirmed design and likely impacts)
26	SJ 78545 84623	Ash	Low	Detailed inspection.
27	SJ 77324 84563	Oak	Low	Detailed inspection.
28	SJ 77306 84559	Oak	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
29	SJ 77280 84566	Oak. Small knot hole apparent in area with broken branches. Unable to inspect from ground properly.	Low	Detailed inspection.
30	SJ 77237 84567	Oak. Small knot hole in apparent standing deadwood	Low	Detailed inspection.
31	SJ 77211 84570	Oak. Torn branch feature.	Low	Detailed inspection.
32	SJ 77150 84644	Oak. Very large and clad with thick, mature ivy with knot hole	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
33	SJ 76665 84625	Oak. Mature oak with limbs all facing east	Low	Detailed inspection.
34	SJ 76395 84745	Oak. Tear out features.	Low	Detailed inspection.
35	SJ 76386 84559	Oak.	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
36	SJ 76388 84547	Oak.	Low	Detailed inspection.
37	SJ 76347 84565	Oak.	Low	Detailed inspection.
38	SJ 76344 84548	Oak.	Low	Detailed inspection.
39	SJ 76297 84556	Oak.	Low	Detailed inspection.
40	SJ 76195 84562	Oak.	Low	Detailed inspection.

Tree Name	Grid Reference	Notes	Bat Roost Potential	Further survey requirements (subject to confirmed design and likely impacts)
41	SJ 76172 84564	Oak.	Low	Detailed inspection.
42	SJ 76248 84628	Mature oak with dead limbs higher up and flaking bark on north face.	Low	Detailed inspection.
43	SJ 76167 84633	Scot's Pine	Low	Detailed inspection.
44	SJ 76164 84566	Oak. Large Branch broken off leaving large deep cavity in trunk.	High	Detailed inspection if possible. If not possible, three survey visits, one dusk emergence and a separate dawn re-entry and a third visit which is either a dusk emergence or dawn re-entry. May to September, at least two surveys between May and August
45	SJ 76156 84566	Oak.	Low	Detailed inspection.
46	SJ 76147 84565	Oak.	Low	Detailed inspection.
47	SJ 76138 84580	Sweet Chestnut	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
48	SJ 76137 84569	Oak. Lifting bark	Low	Detailed inspection.
49	SJ 76137 84560	Oak.	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
50	SJ 75568 84674	Mature riverside willow	Low	Detailed inspection.
51	SJ 75447 84697	Mature riverside willow	Low	Detailed inspection.
52	SJ 75282 84838	Alder. Ivy from base. Thicker from 2m	Low	Detailed inspection.
53	SJ 75288 84843	Mature ash. Ivy cover substantial. Ivy stems very thick in places v	Low	Detailed inspection.
54	SJ 74914 85445	Mature willow sp.	Low	Detailed inspection.

Tree Name	Grid Reference	Notes	Bat Roost Potential	Further survey requirements (subject to confirmed design and likely impacts)
55	SJ 74864 85529	Mature willow sp.	Low	Detailed inspection.
56	SJ 74514 85205	Mature oak on woodland edge	Low	Detailed inspection.
57	SJ 74484 85217	Dead oak on woodland edge	Low	Detailed inspection.
58	SJ 74460 85225	Mature oak on woodland edge	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
59	SJ 74438 85234	Mature ash on woodland edge	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
60	SJ 74426 85232	Mature oak on woodland edge	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August
61	SJ 74382 85251	Mature ash on woodland edge	Low	Detailed inspection.
62	SJ 76310 84568	Unknown conifer, Dense ivy cover	Low	No further surveys required
63	SJ 79554 84559	Dead oak with hollow centre	Moderate	Detailed inspection where possible. If not possible, two survey visits, one dusk emergence and a separate dawn re-entry. May to September, at least one between May and August

A.3. Badger

Table 3-5-1 Badger Survey Results March to June 2017

Sett/Feature Name	Sett/Feature type	Approximate Distance from HE boundary	Number of sett holes	Multiple or Single hole	Other comments	Further survey requirements (subject to confirmed design and likely impacts)
S15	Main Sett	8m	5	Multiple	3 holes in use, the rest have leaf litter	Updated badger survey 6 months prior to construction
S22	Main Sett	80m	6	Multiple	Sett with guard hairs and old badger skull within	Updated badger survey 6 months prior to construction
S28	Main Sett	5m	13	Multiple	Multiple setts and latrines or varying freshness	Updated badger survey 6 months prior to construction
S29	Main Sett	5m	8	Multiple	Rabbit warren immediately to east.	Updated badger survey 6 months prior to construction
S31	Main Sett	Within HE boundary	7	Multiple	Surveyed from across the road, fresh spoil with multiple holes.	Updated badger survey 6 months prior to construction
S33	Main Sett	10m	4	Multiple	Sett with multiple holes	Updated badger survey 6 months prior to construction
S5	Main Sett	50m	7	Multiple	Multiple holes and fresh bedding	Updated badger survey 6 months prior to construction
S10	Sett (unknown classification)	Within HE boundary	3	Multiple	Quite possibly main set but other entrances hidden in dense scrub	Updated badger survey 6 months prior to construction
S11	Sett (unknown classification)	Within HE boundary	2	Multiple	Likely part of S10 complex, fresh bedding and scratches	Updated badger survey 6 months prior to construction
S12	Sett (unknown classification)	Within HE boundary	3	Multiple	Correct shape but slightly too small, possibly fox use.	Updated badger survey 6 months prior to construction

Sett/Feature Name	Sett/Feature type	Approximate Distance from HE boundary	Number of sett holes	Multiple or Single hole	Other comments	Further survey requirements (subject to confirmed design and likely impacts)
S20	Sett (unknown classification)	Within HE boundary	2	Multiple	Fresh mounds, with prints and snuffle holes in area.	Updated badger survey 6 months prior to construction
S3	Sett (unknown classification)	4m	1	Single	Considered that this could be an artificial sett	Updated badger survey 6 months prior to construction
S32	Sett (unknown classification)	Within HE boundary	1	Single	Immediately east of bridge, looks very fresh	Updated badger survey 6 months prior to construction
S4	Sett (unknown classification)	60m	4	Multiple	Two Holes so considered likely to be a subsidiary sett to S6	Updated badger survey 6 months prior to construction
S6	Sett (unknown classification)	Within HE boundary	1	Single	Single sett, which looks active and bedding present.	Updated badger survey 6 months prior to construction
S7	Sett (unknown classification)	1m	1	Single	Single sett under hawthorn in pasture field, very fresh spoil.	Updated badger survey 6 months prior to construction
S8	Sett (unknown classification)	225m	2	Multiple	Very fresh two hole sett	Scoped out – further survey not required
S36	Sett (unknown classification)	Within HE boundary	1	Single	-	Updated badger survey 6 months prior to construction

Sett/Feature Name	Sett/Feature type	Approximate Distance from HE boundary	Number of sett holes	Multiple or Single hole	Other comments	Further survey requirements (subject to confirmed design and likely impacts)
S16	Outlier Sett	8m	1	Single	Spoil heap suggests recent use, but could be fox. Downy fur looks like badger undercoat.	Updated badger survey 6 months prior to construction
S17	Outlier Sett	Within HE boundary	1	Single	Quite small hole, but fresh bedding and no rabbit droppings.	Updated badger survey 6 months prior to construction
S19	Outlier Sett	Within HE boundary	1	Single	-	Updated badger survey 6 months prior to construction
S2	Outlier Sett	6m	1	Single	Guard hair found - partially active	Updated badger survey 6 months prior to construction
S25	Outlier Sett	55m	2	Multiple	Spoil heap suggests recent use, but could be fox	Updated badger survey 6 months prior to construction
S30	Annexe Sett	45m	1	Single	-	Updated badger survey 6 months prior to construction
S1	Inactive Sett	8m	1	Single	Partially active (potentially part of same sett system as S2)	Updated badger survey 6 months prior to construction
S14	Inactive Sett	10m	2	Multiple	Partially active, but no hair or dung found	Updated badger survey 6 months prior to construction
S18	Inactive Sett	112m	1	Single	Partially active.	Scoped out – further survey not require d
S21	Inactive Sett	125m	3	Multiple	No signs of recent use (partially active)	Scoped out – further survey not required
S23	Inactive Sett	55m	3	Multiple	Feeding scrapes found in area - likely old outlier of large sett to north	Updated badger survey 6 months prior to construction

Sett/Feature Name	Sett/Feature type	Approximate Distance from HE boundary	Number of sett holes	Multiple or Single hole	Other comments	Further survey requirements (subject to confirmed design and likely impacts)
S24	Inactive Sett	Within HE boundary	2	Multiple	Not recently active	Updated badger survey 6 months prior to construction
S27	Inactive Sett	3m	1	Single	Rabbit holes in close proximity on other bank	Updated badger survey 6 months prior to construction
S34	Inactive Sett	75m	3	Multiple	No signs of recent use	Updated badger survey 6 months prior to construction
S35	Inactive Sett	Within HE boundary	1	Single	Small entrance possibly fox, not used in some time.	Updated badger survey 6 months prior to construction
S13	Disused Sett	Within HE boundary	1	Single	Destroyed or old set	Updated badger survey 6 months prior to construction
S26	Disused Sett	15m	2	Multiple	Rabbit droppings near entrance	Updated badger survey 6 months prior to construction
S9	Disused Sett	48m	1	Single	Destroyed sett	Updated badger survey 6 months prior to construction
F1	Footprint	162m	-	-	-	N/A
SH1	Foraging	Within HE boundary	-	-	-	N/A
L1	Latrine	Within HE boundary	-	-	-	N/A
L2	Latrine	Within HE boundary	-	-	Reasonably fresh, flies still active	N/A

Sett/Feature Name	Sett/Feature type	Approximate Distance from HE boundary	Number of sett holes	Multiple or Single hole	Other comments	Further survey requirements (subject to confirmed design and likely impacts)
L3	Latrine	Within HE boundary	-	-	Reasonably fresh, pathway leading along top of embankment	N/A
P1	Pathway	75m	-	-	Tracks leading down steep bank with snuffle holes common.	N/A

A.4. Otter and Water Vole

Table 3-6-1 Otter and water vole survey results March to September 2017

Water Course Name	Survey visit completed	Otter Habitat Suitability	Water Vole Habitat Suitability	Further Survey Requirements (subject to confirmed design and likely impacts)
River Bollin	11/04/2017	Suitable – no evidence	Suitable – no evidence	Monitoring for otter
	20/09/2017	Identification of field signs including spraints, footprints and feeding remains	Suitable – no evidence	
River Bollin Drain (7-GCN-10)	22/05/2017	Unsuitable - minor watercourse with, little flow, limited potential for prey and lay up opportunities were limited	Unsuitable	Scoped out – further survey not required
River Bollin Drain (7-GCN-22)	31/05/2017	Suitable – no evidence	Unsuitable	Monitoring for otter

	20/09/2017	Suitable – no evidence	Unsuitable	
Lambs Covert Brook	31/05/2017	Unsuitable – Dry at time of survey	Unsuitable – Dry at time of survey	Scoped out – further survey not required
Birkin Brook	23/05/2017	Suitable – no evidence	Suitable – no evidence	Monitoring for otter and water vole
	20/09/2017	Suitable – no evidence	Suitable – no evidence	
Sutts Hollow Brook	No – access restrictions	Unknown	Unknown	Re-attempt otter & water vole potential survey

A.5. White-clawed Crayfish

Table 3-7-1 White-clawed crayfish survey results March to June 2017

Waterbody Name	Habitat potential completed	White Clawed Crayfish habitat suitability	Notes and comments	Further survey requirements (subject to confirmed design and likely impacts)
River Bollin	11/04/2017	Unsuitable	Silty/sandy bed with infrequent stone, considered unsuitable	Scoped out – further survey not required
River Bollin Drain (7-GCN-10)	22/05/2017	Unsuitable	Nearly dry, low flow ditch rule out - see GCN photo for evidence	Scoped out – further survey not required
River Bollin Drain (7-GCN-22)	31/05/2017	Unsuitable	Small stream, low flow and steep banked - see GCN photo for evidence	Scoped out – further survey not required
Lambs Covert Brook	31/05/2017	Unsuitable	Dry ditch rule out - see GCN photo for evidence	Scoped out – further survey not required
Birkin Brook	23/05/2017	Unsuitable	Silty/sandy bed with no stone, considered unsuitable	Scoped out – further survey not required
Sutts Hollow Brook	No – access restrictions	-	-	Re-attempt white-clawed crayfish potential survey

Appendix B. Summary of Relevant Ecological Legislation

Species	Legislation	Offences	Licensing procedures and guidance
Bats *European protected species*	Conservation of Habitats and Species Regulations 2017 Reg 43	Deliberately[1] capture, injure or kill a bat; deliberate disturbance[2] of bats; or damage or destroy a breeding site or resting place used by a bat. [The protection of bat roosts is considered to apply regardless of whether bats are present.]	A Natural England (NE) licence in respect of development is required. Guidance documents: *NE Standing Advice for protected species 2013* *European Protected Species: Mitigation Licensing- How to get a licence* (NE 2013) *Bat Mitigation Guidelines* (English Nature 2004) *Bat Workers Manual* (JNCC 2004)
	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb[3] a bat in such a place.	Licence from NE is required for surveys (scientific purposes) that would involve disturbance of bats or entering a known or suspected roost site.
Badger	Protection of Badgers Act 1992 (as amended)	Wilfully kill, injure or take a badger; or intentionally or recklessly damage, destroy or obstruct access to a badger sett or disturb a badger in its sett. [It is not illegal to carry out disturbance activities in the vicinity of setts that are not occupied.]	Where required, licences for development activities involving disturbance or sett interference or closure are issued by Natural England (NE). Licences for activities involving watercourse maintenance, drainage works or flood defences are issued under a separate process. Licences are normally not granted from December to June inclusive because cubs may be present within setts. Guidance documents: *NE Standing Advice for protected species 2013* *Badgers & Development* (NE 2007)
Otter *European protected species*	Conservation of Habitats and Species Regulations 2017 Reg 43	Deliberately[1] capture, injure or kill an otter; deliberate disturbance[2] of otters; or damage or destroy a breeding site or resting place used by an otter.	Licences issued for development by Natural England. Guidance documents: *NE Standing Advice for protected species 2013* *European Protected Species: Mitigation Licensing- How to get a licence* (NE 2013)
	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb[3] an otter in such a place.	No licence is required for survey in England. However, a licence would be required if the survey methodology involved disturbance.
Hazel dormouse *European protected species*	Conservation of Habitats and Species Regulations 2017 Reg 43	Deliberately[1] capture, injure or kill a hazel dormouse; deliberate disturbance[2] of a hazel dormouse; or damage or destroy a breeding site or resting place used by a hazel dormouse.	A Natural England licence in respect of development is required. Guidance documents: *NE Standing Advice for protected species 2013* *European Protected Species: Mitigation Licensing- How to get a licence* (NE 2013) *Dormouse Conservation Handbook* (English Nature 2006)

Species	Legislation	Offences	Licensing procedures and guidance
	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb[3] a hazel dormouse in such a place.	Licence issued for survey and conservation by Natural England.
Water vole	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally kill, injure or take water voles; intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or disturb a water vole in such a place.	Conservarion licences issued for trapping and translocation operations by Natural England. Certain displacement operations can be carried out under a class licence. Guidance documents: *The Water Vole Conservation Handbook* (R. Strachan & T. Moorhouse, Wildlife Conservation Research Unit, 3nd Edition 2011) *Water voles and development licensing policy* - NE Technical Information Note TIN042 2008 *NE Standing Advice for protected species 2013* The Water Vole Mitigation Handbook (M. Dean, R. Strachan, D. Gow & R. Andrews 2016)
Red squirrel	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally kill, injure or take red squirrels; intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or disturb a red squirrel in such a place.	The legislation does not permit licences to be issued in relation to development of land. There is, however, provision within the legislation to carry out otherwise unlawful activities to red squirrel under a licence in certain defined circumstances. Licences are available for conservation, for example. Natural England do not provide guidance for problems with red squirrels and licensing but they can be contacted for specific advice. The Forestry Commission provides several guidance notes on forestry related operations: *FCS Guidance Note 31:* Forest operations and wildlife protection: November 2006 *Management guidelines for Red squirrel reserves in northern England,* Operations Note 10a 1st June 2008 *Special guidance for woodland creation in red squirrel focal areas*, GWC red squirrel special guidance, G&R FCW, 14 February 2011

Species	Legislation	Offences	Licensing procedures and guidance
Birds	Wildlife and Countryside Act 1981 (as amended) S.1	Intentionally kill, injure or take any wild bird; intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; intentionally take or destroy the nest or eggs of any wild bird. Intentionally or recklessly disturb a Schedule 1 species while it is building a nest or is in, on or near a nest containing eggs or young; intentionally or recklessly disturb dependent young of such a species [e.g. most birds of prey, kingfisher, barn owl, black redstart, little ringed plover].	No licences are available to disturb any birds in regard to development. Licences are available in certain circumstances to damage or destroy nests, but these only apply to the list of licensable activities in the Act and do not cover development. General licences are available in respect of 'pest species' but only for certain very specific purposes e.g. public health, public safety, air safety. Guidance documents: *NE Standing Advice for protected species 2013*
Great crested newt *European protected species*	Conservation of Habitats and Species Regulations 2017 Reg 43	Deliberately[1] capture, injure or kill a great crested newt; deliberate disturbance[2] of a great crested newt; deliberately take or destroy its eggs; or damage or destroy a breeding site or resting place used by a great crested newt.	Licences issued for development by Natural England. Guidance documents: *NE Standing Advice for protected species 2013* *European Protected Species: Mitigation Licensing- How to get a licence* (NE 2013) *Great Crested Newt Mitigation Guidelines* (English Nature 2001)
	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb[3] a great crested newt in such a place.	Licences issued for science (survey), education and conservation by Natural England.

Species	Legislation	Offences	Licensing procedures and guidance
Natterjack toad **Sand lizard** **Smooth snake** *European protected species*	Conservation of Habitats and Species Regulations 2017 Reg 43	Deliberately[1] capture, injure or kill it; deliberate disturbance[2] of it; deliberately take or destroy its eggs; or damage or destroy a breeding site or resting place used by it.	Licences issued for development by Natural England. Guidance documents: *NE Standing Advice for protected species 2013* *European Protected Species: Mitigation Licensing- How to get a licence* (NE 2013)
	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb[3] it in such a place.	A licence is required from Natural England for surveying and handling.
Adder **Common lizard** **Grass snake** **Slow worm**	Wildlife and Countryside Act 1981 S.9(1) and S.9(5)	Intentionally kill or injure any common reptile species.	No licence is required. However an assessment for the potential of a site to support reptiles should be undertaken prior to any development works which have potential to affect these animals. Guidance documents: *NE Standing Advice for protected species 2013*
White-clawed crayfish	Wildlife and Countryside Act 1981 S.9(1) only	Intentionally take from the wild.	Licences issued by Natural England for survey (to take crayfish by hand, by hand net or by crayfish trap). Use of crayfish traps for survey requires Environment Agency consent. Using crayfish traps to remove crayfish for maintenance or development activities in a watercourse requires a conservation licence from Natural England and a permit from the Environment Agency. No licences in respect of development are available. Guidance documents: *NE Standing Advice for protected species 2013*
Roman snail	Wildlife and Countryside Act 1981 S.9(1), S.9 (2) and S.9(5)	Intentionally kill, injure or take a Roman snail.	A licence from Natural England is required to pick up and survey Roman snails. Roman snails are distributed within England only. There are currently no licensing purposes that explicitly cover development activities. However when a proposed lawful activity has no opportunity to retain Roman snails within a development site and their translocation would result in a conservation benefit then a licence from Natural England may be obtained. NE Technical Information Note 103: *Roman snails and development*
Rabbits, foxes and other wild mammals	Wild Mammals (Protection) Act 1996	Intentionally inflict unnecessary suffering to any wild mammal.	Natural England provides guidance in relation to rabbits, foxes (which are also protected under the Wildlife and Countryside Act 1981 from live baits and decoys) and other wild mammals, on their website. Lawful and humane pest control of these species is permitted.
Plants *European protected species*	Conservation of Habitats and Species Regulations 2017 Reg 47	Deliberately pick, collect, cut, uproot or destroy a wild plant of a European protected species (Schedule 5).	Licences can be issued for science, education and conservation and also in respect of a development if it is of over-riding public interest. Guidance documents: *NE Standing Advice for protected species 2013* *European Protected Species: Mitigation Licensing- How to get a licence* (NE 2013) *Guidance on sampling rare aquatic plants, NE 2009*

Species	Legislation	Offences	Licensing procedures and guidance
Plants *Nationally protected species*	Wildlife and Countryside Act 1981 S.13 (Schedule 8)	Intentionally pick, uproot or destroy any wild plant on Schedule 8	Licences can be issued by Natural England for specific purposes only, such as science and education or conservation purposes. There is no provision for licensing the above actions for development operations under the Wildlife & Countryside Act 1981 (as amended). No licence is required for survey in England. Guidance on survey techniques is available from Natural England. Guidance documents: *NE Standing Advice for protected species 2013*
Plants *Invasive species e.g.* Japanese knotweed, hybrid knotweed, giant knotweed, giant hogweed, rhododendron, Himalayan balsam	Wildlife and Countryside Act 1981 S.14	It is illegal to plant or otherwise cause these species to grow in the wild.	Any contaminated soil or plant material is classified as controlled waste and should be disposed of in a suitably licensed landfill site, accompanied by appropriate Waste Transfer documentation, and must comply with section 34 of the Environmental Protection Act 1990. Guidance documents: *The Knotweed Code of Practice* (Environment Agency, 2013 version 3) *Managing Invasive Non-native Plants* (Environment Agency 2010) *Guidance on Section 14 of the Wildlife and Countryside Act, 1981* (Defra 2010)

[1]Deliberate capture or killing is taken to include "accepting the possibility" of such capture or killing

[2]Deliberate disturbance of animals includes in particular any disturbance which is likely a) to impair their ability (I) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to affect significantly the local distribution or abundance of the species to which they belong.

[3]Lower levels of disturbance not covered by the Conservation of Habitats and Species Regulations 2010 remain an offence under the Wildlife and Countryside Act 1981 although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided.

Site Designation	Legislation	Protection	Guidance
Special Area of Conservation (SAC) **Special Protection Area (SPA)** **Wetland of International Importance (Ramsar site)**	Conservation of Habitats and Species Regulations 2017 EC Directive on the conservation of natural habitats and of wild fauna and flora (92/42/EEC). EC Directive on the conservation of wild birds (79/409/EEC). Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (the Ramsar Convention).	Assessment of the implications of plans and projects is effected through Part 6 of the Conservation of Habitats and Species Regulations 2017 (in particular Regs 61 – 69). The legislation for the Site of Special Scientific Interest which will underpin each designation also applies. These sites are given protection through policies in the Local Development Plan.	Formal Appropriate Assessment is required to be undertaken by the competent authority before undertaking, or giving consent, permission or other authorisation for a plan or project which is likely to have a significant effect on such a site. Guidance documents: The *National Planning Policy Framework* (Department for Communities and Local Government, March 2012), with particular reference to Policy 11. The Government Circular: *Biodiversity and Geological Conservation - Statutory Obligations and their Impact within the Planning System* (ODPM Circular 6/2005 & Defra Circular 01/2005) (the joint Circular).
Site of Special Scientific Interest (SSSI)	Wildlife and Countryside Act 1981 (as amended)	It is an offence to carry out or permit to be carried out any potentially damaging operation. SSSIs are given protection through policies in the Local Development Plan.	Owners, occupiers, public bodies and statutory undertakers must give notice and obtain the appropriate consent under S.28 before undertaking operations likely to damage a SSSI. S.28G places a duty on all public bodies to further the conservation and enhancement of SSSIs. Guidance documents: The *National Planning Policy Framework* (Department for Communities and Local Government, March 2012), with particular reference to Policy 11, and the joint Circular.
Natural Nature Reserve (NNR)	Wildlife and Countryside Act 1981 (as amended) S35 National Parks and Access to the Countryside Act 1949 S.16-29	Most NNRs are underpinned by SSSIs and are therefore protected by the measures detailed above. For NNRs not underpinned by SSSIs it is still an offence to carry out or permit to be carried out any potentially damaging operation. NNRs are given protection through policies in the Local Development Plan.	NNRs are generally owned and managed by the designating body (e.g. Natural England). Development proposals that would potentially affect a NNR would need to provide a detailed justification for the work, an assessment of likely impacts, together with proposals for mitigation and restoration of habitats lost or damaged. Guidance documents: The *National Planning Policy Framework* (Department for Communities and Local Government, March 2012), with particular reference to Policy 11, and the joint Circular.
Local Nature Reserve (LNR)	National Parks and Access to the Countryside Act 1949 S.21	LNRs are given protection through policies in the Local Development Plan.	LNRs are generally owned and managed by local authorities. Development proposals that would potentially affect a LNR would need to provide a detailed justification for the work, an assessment of likely impacts, together with proposals for mitigation and restoration of habitats lost or damaged. Guidance documents: The *National Planning Policy Framework* (Department for Communities and Local Government, March 2012), with particular reference to Policy 11, and the joint Circular.
Local Sites (eg County Wildlife Sites, Sites of	There is no statutory designation for local sites.	Local sites are given protection through policies in the Local Development Plan.	Development proposals that would potentially affect a local site would need to provide a detailed justification for the work, an assessment of likely impacts, together with proposals for mitigation and restoration of habitats lost or damaged.

Site Designation	Legislation	Protection	Guidance
Importance for Nature Conservation)			Guidance documents: The *National Planning Policy Framework* (Department for Communities and Local Government, March 2012), with particular reference to Policy 11, and the joint Circular.

Habitats & Species	Legislation	Guidance
Species and Habitats of Principal Importance for the Conservation of Biodiversity	Natural Environment & Rural Communities Act 2006 S.40	S.40 of the NERC Act 2006 sets out the duty for public authorities to conserve biodiversity in England. Habitats and species of principal importance for the conservation of biodiversity are identified by the Secretary of State for England, in consultation with Natural England, are referred to in S.41 of the NERC Act for England. The list, known as the 'England Biodiversity List', of habitats and species can be found on the Natural England web site. The 'England Biodiversity List' is used as a guide for decision makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act 2006 to have regard to the conservation of biodiversity in England when carrying out their normal functions. Ecological impact assessments should include an assessment of the likely impacts to these habitats and species.
Biodiversity Action Plan (BAP) Habitats & Species	No specific legislation, unless it is also a species or habitat of principal importance as described above.	The Biodiversity Action Plan (BAP) is the UK's initiative to maintain and enhance biodiversity in response to the Convention on Biological Diversity signed in 1992. The UK BAP was used to draw up the 'England Biodiversity List' and has been succeeded by the UK Post-2010 Biodiversity Framework in 2012, due to a change in government strategy by all UK countries, focussing on managing the environment as a whole rather than dealing with different aspects of biodiversity and environment separately. However, the UK BAP list of priority habitats and species continue to be regarded as conservation priorities in the UK Post-2010 Biodiversity Framework (JNCC & Defra 2012).
Hedgerows	The Hedgerows Regulations 1997	Under the regulations, it is against the law to remove or destroy certain hedgerows without permission from the local planning authority in Wales. In general, permission will be required before removing hedges that are at least 20 metres in length, over 30 years old and contain certain species of plant. The local planning authority will assess the importance of the hedgerow using criteria set out in the regulations.

Appendix C. Target Notes for Broad Habitat Plan

Target Note	Description
TN1	Scattered trees and scrub. Young birch and hawthorn plantation. Some hazel and ash.
TN2	Scattered scrub and broadleaved trees. A mix of very young sapling with some semi-mature trees.
TN3	Wet with willow species.
TN4	Ivy clad mature oak.
TN5	Dense bramble scrub. Scattered young oak and ash.
TN6	Poor semi-improved grassland. Reed canary grass, yorkshire fog, cocksfoot, scattered young-semi mature trees, ash, hawthorn, oak present.
TN7	Mature oak.
TN8	Young plantation with hawthorn and ash dominant. Dense scrub understory.
TN9	Plantation scrub. Dominant scrub. Dense with trees.
TN10	Dense scrub adjacent to Highways England land with mixed trees. Mature/semi mature trees.
TN11	Semi-mature ash.
TN12	Several ivy clad trees. Semi-mature to young sycamore.
TN13	Vegetation including lesser celandine, nettle.
TN14	Vegetation including wood anemone, lesser celandine and Himalayan balsam.
TN15	Plantation Broadleaved Woodland with small strip of poor semi improved grassland. Trees include Ash, Willow sp., Silver Birch, Hawthorn. All are young/semi mature.

TN16	Lesser celandine, marsh marigold and meadowsweet present.
TN17	Broadleaved semi-natural woodland with lesser celandine, wood anemone, Dog's mercury, Bluebell. Some boggier patches.
TN18	Newt fencing runs along highways boundary
TN19	Brambles dominate verge vegetation
TN20	Barn owl sighting
TN21	Himalayan balsam at top of embankment
TN22	Himalayan balsam on both sides on River Bollin
TN23	Kingfisher sighting
TN24	Semi-natural broadleaf woodland consisting of mature ash, oak, hawthorn and sycamore
TN25	Dense scrub with intermittent poor semi improved grassland and scattered young plantation trees
TN26	Himalayan balsam present
TN27	Himalayan balsam present
TN28	Intermittent dense scrub dominated by brambles
TN29	Intermittent dense scrub dominated by brambles
TN30	Intermittent dense scrub dominated by brambles
TN31	Dense scrub within both northbound and southbound woodlands
TN32	Stand of Japanese knotweed
TN33	Dactylorhiza sp. possibly Northern Marsh Orchids present. Approx. 10 individuals
TN34	Dactylorhiza sp. individuals on grass strip along motorway edge

TN35	Rhododendron along verge
TN36	Little ringed plover sighted
TN37	Himalayan balsam present
TN38	Patch of scots pine at eastern extent of woodland
TN39	Rhododendron on highways
TN40	Male yellow wagtail sighted
TN41	Rhododendron on highways
TN42	Scrub would provide suitable habitat for reptiles
TN43	Stand of Japanese knotweed
TN44	Rhododendron on highways
TN45	Undergrowth to either side of river dominated by Himalayan balsam
TN46	Himalayan balsam present
TN47	Nesting lapwings
TN48	Giant hogweed present
TN49	Dense scrub composed of gorse, common nettle and bramble
TN50	Poor semi-improved grassland composed of cow parsley, nettle, wild Angelica, red clover present
TN51	Himalayan balsam prevalent within woodland
TN52	Giant hogweed present

Appendix C.2 – M56 Junction 6 to 8: Smart Motorway Habitat Regulations Assessment