

**M54 to M6 Link Road**

**TR010054**

**Volume 6**

**6.3 Environmental Statement**

**Appendices**

**Appendix 8.13: Terrestrial Invertebrates**

Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed  
Forms and Procedure) Regulations 2009

January 2020

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning  
(Applications: Prescribed Forms and  
Procedure) Regulations 2009**

**M54 to M6 Link Road  
Development Consent Order 202[ ]**

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**6.3 Environmental Statement Appendices  
Appendix 8.13 Terrestrial Invertebrates**

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# 1 Introduction

1.1.1 Highways England are developing a link road between the M54 and M6 to provide a link between Junction 1 of the M54, M6 North and the A460 to Cannock. The M54 to M6 Link Road (herein referred to as ‘the Scheme’) aims to reduce congestion on local / regional routes, particularly the A449 and A460 and deliver improved transport links to encourage the development of the surrounding area. This appendix has been prepared in respect of terrestrial invertebrates relating to the Scheme.

1.1.2 This appendix includes the following information:

- legislation and planning policy relevant to terrestrial invertebrates;
- methodologies for desk and field- based assessments undertaken in 2018 and 2019 to identify the ecological importance of the terrestrial invertebrate assemblage present;
- competencies of the ecologists involved in undertaking the above surveys;
- limitations to the surveys undertaken and any assumptions made as a result of incomplete data;
- survey results; and
- the approach for determining the nature conservation importance.

1.1.3 This appendix should be read in conjunction with Chapter 8: Biodiversity of the Environmental Statement (ES) [TR010054/APP/6.1].

## 2 Relevant legislation and policy

### 2.1 Legislation

- 2.1.1 Appendix 8.1 Legislation and Planning Policy Framework [TR010054/APP/6.3] provides detail on the legislation that is of direct relevance to the assessment of biodiversity.
- 2.1.2 There are twelve invertebrates on Annex II of the Habitats Directive in the UK, most of which are wetland specialists. The strict protection offered by Annex IV of the Habitats Directive applies to only three UK species, none of which are potentially relevant to the habitats present within the Scheme boundary.
- 2.1.3 Approximately 40 species of invertebrate are listed under Schedule 5 of the Wildlife and Countryside Act (1981), protected by Section 9 of the Act (although many are protected against being sold only).

### 2.2 Planning policy

- 2.2.1 Full detail of relevant national and local planning policy planning policy relevant to nature conservation is provided in Appendix 8.1 [TR010054/APP/6.3] and a summary is provided in Chapter 8: Biodiversity of the ES [TR010054/APP/6.1].

### 2.3 Priority species

- 2.3.1 There are just under 400 invertebrates that are listed on Section 41 of the Natural Environment and Rural Communities Act (NERC) 2006 (refer to Appendix 8.1 [TR010054/APP/6.3]) whose conservation is a priority in England and therefore a material planning concern. Many such species are listed based on recent declines but are not necessarily rare and conversely several species that are Rare/Scarce are not listed.
- 2.3.2 The Staffordshire Biodiversity Action Plan (SBAP) (Ref 1) lists the following species of invertebrate:
- bog bush-cricket (*Metrioptera brachyptera*);
  - ground Nesting Solitary Bees and Wasps;
  - small Pearl-bordered Fritillary (*Boloria selene*); and
  - white-faced Darter (*Leucorrhinia dubia*).
- 2.3.3 The invertebrate action plans include the general objectives to “*maintain and enhance the existing populations within Staffordshire*” and “*to create new suitable areas at sites known to contain the species to facilitate colony expansion*”.

## 3 Methodology

### 3.1 Desk study

- 3.1.1 Records for terrestrial invertebrate species were requested from Staffordshire Ecological Record Centre (SERC), and the Ecological records centre for Birmingham and the Black Country (EcoRecord) in 2018 for 2 km from the Scheme boundary which is considered appropriate to obtain an indication of terrestrial invertebrate presence within the wider landscape.
- 3.1.2 Only records from the last 10 years have been included. Where only a historic (i.e. over 10 years old) record is present this has been used for context.
- 3.1.3 This desk study data has been used to inform assumptions in relation to terrestrial invertebrates where field data is incomplete, or access was not possible.

### 3.2 Field survey

#### **Surveyor competency**

- 3.2.1 The surveys were undertaken by invertebrate specialists with over 10 years of consultancy experience. Both surveyors are members of CIEEM and hold PhDs in invertebrate ecology, and one is a Fellow of the Royal Entomological Society.

#### **Survey protocols**

- 3.2.2 The core period for terrestrial invertebrate surveys is considered to be April – September as this is when the majority of each invertebrate group reach their greatest species richness and therefore surveys will provide the best indication of the species assemblage present (Ref 2). Surveys were undertaken at either end of this period in order to account for early and late emerging species.

#### May

- 3.2.3 Surveys in May 2019 comprised 13 sets of sweep samples following the protocols of Drake et al. (Ref 1) together with three interception trap samples in wooded areas within the Scheme boundary. Sites were selected that represented the best available potential invertebrate habitats and included sites within and outside but immediately adjacent to the Scheme boundary. Survey locations are shown in Figures 8.31 and 8.32 of the ES [TR010054/APP/6.2].

#### September

- 3.2.4 Invertebrate surveys in September 2019 took the form of 12 sets of 40-minute timed sampling using a range of strategies including sweep netting, spot netting and hand searching. Samples were preserved in 70% propanol and identified later. Distinctive species were recorded and released. Where possible, the same sites were surveyed in September as in May. However, the three sites outside the Scheme boundary sampled in May were excluded (Sites 7, 10, and 12), and there was no available access to a further site within the Scheme boundary (Site 13). To compensate for this, four additional sites were added within the Scheme boundary (Sites 14 – 17). Survey locations are shown in Figure 8.33 [TR010054/APP/6.2].

**Table 3.1: Survey sites**

Site number	Grid reference	Position relative to Scheme boundary	Habitat	May surveys	September surveys
1	SJ94360533	Inside	Linear strip of broadleaved plantation	Sweep, intercept	Sweep
2	SJ94290521	Inside	Linear strip of broadleaved plantation	Sweep, intercept	Sweep
3	SJ94270503	Inside	Linear strip of broadleaved plantation	Sweep	Sweep
4	SJ95810620	Inside	Marsh	Sweep	Sweep
5	SJ95710642	Inside	Semi-natural broadleaved woodland	Sweep	Sweep
6	SJ95590644	Inside	Semi-natural broadleaved woodland	Sweep	Sweep
7	SJ96140622	Immediately adjacent	Semi-improved grassland	Sweep	None
8	SJ95110544	Inside	Poor semi-improved grassland, hedgerow, woodland edge.	Sweep	None
9	SJ95030507	Inside	Poor semi-improved grassland, hedgerow, woodland edge.	Sweep, intercept	Sweep
10	SJ95430551	Immediately adjacent	Mixed woodland plantation	Sweep	Sweep
11	SJ95160666	Inside	Woodland fringe, improved grassland.	Sweep	Sweep
12	SJ95670766	Immediately adjacent	Broadleaved plantation	Sweep	None
13	SJ94020453	Inside	Broadleaved plantation	Sweep	None
14	SJ95330665	Inside	Woodland fringe, improved grassland.	None	Sweep
15	SJ94760550	Inside	Broadleaved plantation and ornamental fishing lakes	None	Sweep
16	SJ94680537	Inside	Broadleaved plantation and ornamental fishing lakes	None	Sweep
17	SJ95860717	Inside	Linear semi-natural broadleaved woodland strip lining a trackway	None	Sweep

## Target taxa

3.2.5 In May, target taxa for each surveyed habitat were as described in Drake *et al* (Ref 2). In September, all taxa on the ISIS database were targeted. A number of poorly-known invertebrate taxa are not included in the ISIS database. Such taxa are often hard to identify, have unclear habitat affinities, or their national status is uncertain. Such taxa include families in the Lepidoptera, Diptera and Coleoptera. For this reason, surveys and identification of preserved material focussed only upon families in the ISIS database. Some taxa not in the ISIS database were included in May surveys. No direct information is available about the specialist habitat requirements of such species, but some are well-known enough to have known distributions and conservation designations.

## 3.3 Nature conservation evaluation

3.3.1 The evaluation standards for invertebrate habitats are as established by Colin Plant Associates (Ref 3), with seven levels of significance from International to Low. As developed originally, the criteria for assessment was based on the numbers of rare and scarce species. Following the development of additional schemes for classifying invertebrate assemblages (see 'Invertebrate Species-habitat Information System') it is now accepted that a level of professional judgement should be applied when assigning value, to consider factors such as the presence of specialist species as indicators of high-quality habitat. The Colin Plant Associates criteria are:

- International: Internationally important invertebrate populations present or containing Red Data Book (RDB) 1 (Endangered) species or containing any species protected under European legislation or containing habitats that are threatened or rare at the European level (including, but not exclusively so, habitats listed on the EU Habitats Directive);
- National: Achieving Site of Special Scientific Interest (SSSI) invertebrate criteria (or containing RDB2 (Vulnerable) or containing viable populations of RDB 3 (Rare) species or containing viable populations of any species protected under UK legislation or containing habitats that are threatened or rare nationally (Great Britain);
- Regional: Habitat that is scarce or threatened in the region or which has, or is reasonably expected to have, the presence of an assemblage of invertebrates including at least ten Nationally Notable species;
- County: Habitat that is scarce or threatened in the county and/or which contains or is reasonably expected to contain an assemblage of invertebrates that includes viable populations of at least five Nationally Notable / Scarce species;
- District: A rather vague definition of habitats falling below county significance level, but which may be of greater significance than merely Local. They include sites for which Nationally Notable / Scarce species in the range from 1 to 4 examples are reasonably expected but not yet necessarily recorded and where this omission is considered likely to be partly due to under-recording;
- Local: Habitats or species unique or of some other significance within the local area; and



- Low: Although almost no area is completely without significance these are the areas with nothing more than expected “background” populations of common species and the occasional Nationally Local species.

### **Invertebrate species-habitat information system (ISIS)**

- 3.3.2 ISIS was developed “to provide a context for assessing the quality and condition of sites for nature conservation purposes.” (Ref 4). ISIS addresses several problems in assessing sites using invertebrate data, including a lack of accepted standards for evaluating invertebrate assemblages and a lack of understanding of strategic issues for invertebrates, even among experts in particular groups (Ref 4).
- 3.3.3 ISIS uses ecological knowledge of many invertebrate taxa to characterise invertebrate assemblages and assess their quality. Each well-known or moderately well-known invertebrate species in the UK has been allocated to a habitat type, where such specialism is known to exist. Habitat affinities are hierarchical, so for example all taxa linked to the Specific Assemblage Type (SAT) Bare Sand and Chalk are also linked to the Broad Assemblage Type (BAT) Unshaded Early Successional Mosaic. Many of the taxa in the ISIS database do not, however, have particular habitat affinities.
- 3.3.4 ISIS gives species quality scores for BATs and SATs represented in the inventory, which is measured against the Natural England Common Standards for Monitoring (CSM) objective score for each SAT. Other measures of quality produced by the spreadsheet include % of national species pool present for a SAT and whether SATs are in favourable condition based on the number of qualifying species in the assemblage (i.e. whether they are of SSSI-level (national) importance). For assemblages dependent on decaying wood, the spreadsheet also calculates an index of ecological continuity (IEC). The latter measure produces higher scores when species associated with continuous occupation by ancient woodland are present.
- 3.3.5 To enable sites to be compared, and to measure changes in sites over time, ISIS survey protocols are standardised (Ref 2); both May and September surveys followed these protocols.
- 3.3.6 A new tool for assessing invertebrates called Pantheon has been developed on the same database as ISIS. It is not used here because ISIS is supported by peer-reviewed literature and a handbook (Ref 2, Ref 4) and there are also some advantages in terms of the clarity of the output.

### **Nature conservation designations of species**

- 3.3.7 Table 3.2 describes the nature conservation designations assigned to species in the results section.

**Table 3.2: Nature conservation designations**

Category	IUCN Criteria
Extinct (EX)	Taxa which are no longer known to exist in the wild after repeated searches of their localities and other known likely places.
Extinct in the Wild (EW)	A taxon is Extinct in the wild when it is known to survive only in cultivation, in captivity or as a naturalised population (or populations) well outside the past range.

Category	IUCN Criteria
	A taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual) throughout its range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
Critically Endangered (CR)	A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the criteria A to E.
Critically Endangered (Possibly Extinct) (CR (PE))	'Possibly Extinct' and 'Possibly Extinct in the Wild' have been developed to identify Critically Endangered species that are likely to already be extinct (or extinct in the wild), but for which confirmation is required.
Endangered (EN)	A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.
Vulnerable (VU)	A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.
Near Threatened (NT)	A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now (or Lower risk- conservation dependant in the pre 1994 criteria) but is close to qualifying for or is likely to qualify for a threatened category in the near future. In Britain, this category includes species which occur in 15 or fewer hectads but do not qualify as Critically Endangered, Endangered or Vulnerable.
Rare (R)	Taxa with small populations that are not at present Endangered or Vulnerable but are at risk. (In GB, this was interpreted as species which exist in fifteen or fewer 10km squares). Category not in 1994 or 2001 criteria, but still applicable to lists that have not been reviewed since 1994.
Lower risk – conservation dependent (CD)	Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation programme targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years. Category not in 1994 or 2001 criteria, but still applicable to lists that have not been reviewed since 1994.
Lower risk - least concern (LC)	A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable, Near Threatened (or Lower Risk - conservation dependant, or Nationally Scarce in Britain). Widespread and abundant taxa are included in this category.
Data Deficient (DD)	A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat or Lower Risk. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that a threatened category is appropriate.
Not Evaluated (NE)	A taxon is Not Evaluated when it is has not yet been evaluated against the criteria.
<b>Nationally rare and scarce species</b>	

Category	IUCN Criteria
Nationally rare (NR)	Occurring in 15 or fewer hectads in Great Britain
Nationally scarce (NS)	Taxa which are recorded in 16-100 hectads (10km squares) but not included in one of the Red List Categories.
Nationally Notable A (Na)	Occurring in 16-30 hectads in Great Britain.
Nationally Notable B (Nb)	Occurring in 31-100 hectads in Great Britain.

### 3.4 Assumptions and limitations

#### Desk study

- 3.4.1 The information collected from the background record search represents only those records submitted to records centres and is therefore not considered to be a definitive list of terrestrial invertebrates identified within the Desk Study Area. If records have not been provided, this does not confirm absence from the Scheme boundary.
- 3.4.2 The following are inherent limitations of a desk study which includes obtaining data from a Biological Records Centre (BRC):
- recorder bias - biological records are not a representation of the distribution of species within the search area, only records of those species, so the dataset provided by a BRC may be biased towards the favoured locations / 'patches' of local recorders and the presence (or absence) of specialist recording groups (invertebrate group) within that county or vice county;
  - incomplete data – the current dataset held by a BRC is the considered to be the most accurate and most up-to-date representation of species within each BRC boundary although records are largely random. Where atlases which have systematically surveyed monads, tetrads, or hectads for taxonomic groups within a given area are available these records therein are a more accurate picture of species assemblage and distribution;
  - data availability lag - Resources at BRCs can be limited, which can lead to a lag between the time that records are submitted by recorders and the time that they are verified and entered into the database for that county. Additionally, special interest recording groups (which often hold their own datasets) may only submit their records annually (if at all) which causes further lag in dataset accuracy; and
  - changes in data due to the verification process –Where new information or specialist knowledge sheds light on the validity of recent or historical submitted records, the verification process may add or remove which may alter the results of a data search over time with same parameters.

### **Field surveys**

- 3.4.3 The field surveys in September were in sub-optimal conditions, with only intermittent sunshine and generally cold conditions. However, in combination with May surveys, it is considered that a robust assessment of the invertebrate populations and habitats present has been undertaken.
- 3.4.4 It was not possible to survey one May site again in September owing to the presence of cattle. This field consists of improved and herb-poor grassland and is thought unlikely to support rare and scarce species.

## 4 Results and evaluation

### 4.1 Desk study

4.1.1 There are no records of terrestrial invertebrates returned from SER or EcoRecord within 2 km of the Scheme boundary.

### 4.2 Field survey

#### Habitat suitability assessment

4.2.1 A summary of results from the May and September surveys is shown in Table 4.1.

**Table 4.1: Summary of survey results**

Site and Sampling Method	Rare or scarce species	Specialist species	Specialist habitats
<b>Site 1</b>			
May Sweep	None	None	N/A
May Intercept	None	<i>Anaspis maculate</i> <i>Dacne rufifrons</i>	A212 Bark and Sapwood Decay A213 Fungal Fruting Bodies
September Sweep	None	None	
<b>Site 2</b>			
May Sweep	<i>Sitona macularius</i> (Nb)	<i>Malthodes minimus</i>	A212 Bark and Sapwood Decay
May Intercept	None	<i>Grammoptera ruficornis</i> <i>Epuraea guttata</i> <i>Soronia grisea</i> <i>Dasytes aeratus</i>	A212 Bark and Sapwood Decay A212 Bark and Sapwood Decay A212 Bark and Sapwood Decay A212 Bark and Sapwood Decay
September Sweep	None	None	
<b>Site 3</b>			
May Sweep	<i>Pityogenes quadridens</i> (Na)	<i>Pityogenes quadridens</i>	A212 Bark and Sapwood Decay
September Sweep	None	None	
<b>Site 4</b>			
May Sweep		<i>Malachius bipustulatus</i>	A212 Bark and Sapwood Decay

Site and Sampling Method	Rare or scarce species	Specialist species	Specialist habitats
September Sweep	None	None	
<b>Site 5</b>			
May Sweep	None	None	N/A
September Sweep	None	None	
<b>Site 6</b>			
May Sweep	<i>Enicmus fungicola</i> (N) <i>Lonchoptera nigrociliata</i> (LC, NS) <i>Ochrosis ventralis</i> (VU)	<i>Lonchoptera nigrociliata</i> <i>Malachius bipustulatus</i> <i>Enicmus fungicola</i>	W114 Stream and River Margin A212 Bark and Sapwood Decay A212 Bark and Sapwood Decay
September Sweep	None	<i>Sinodendron cylindricum</i>	A211 Heartwood Decay
<b>Site 7</b>			
May Sweep	<i>Ochrosis ventralis</i> (VU) <i>Mordellistena brevicauda</i> (DD) <i>Pseudorcheses pratensis</i> (Nb)	<i>Pseudorcheses pratensis</i>	F112 Open Short Sward
<b>Site 8</b>			
May Sweep	<i>Pityogenes quadridens</i> (Na) <i>Lasioglossum malachurum</i> (Nb)	<i>Pityogenes quadridens</i> <i>Malachius bipustulatus</i>	A212 Bark and Sapwood Decay A212 Bark and Sapwood Decay
<b>Site 9</b>			
May Sweep	<i>Anisoxya fuscula</i> (LC, NS)	<i>Malachius bipustulatus</i> <i>Anisoxya fuscula</i>	A212 Bark and Sapwood Decay A212 Bark and Sapwood Decay
May Intercept	<i>Anisoxya fuscula</i> (LC, NS) <i>Abdera flexuosa</i> (LC, NS)	<i>Conopalpus testaceus</i> <i>Abdera flexuosa</i> <i>Anisoxya fuscula</i> <i>Rhizophagus bipustulatus</i> <i>Xylophagus ater</i>	A212 Bark and Sapwood Decay A213 Fungal Fruting Bodies A212 Bark and Sapwood Decay A212 Bark and Sapwood Decay A212 Bark and Sapwood Decay

Site and Sampling Method	Rare or scarce species	Specialist species	Specialist habitats
September Sweep	None	None	
<b>Site 10</b>			
May Sweep	<i>Anisoxya fuscata</i> (LC, NS) <i>Globicornis rufitarsis</i> (VU, NR) <i>Omiamima mollina</i> (Na)	<i>Malachius bipustulatus</i> <i>Anisoxya fuscata</i> <i>Xanthostigma xanthostigma</i> <i>Globicornis rufitarsis</i>	A212 Bark and Sapwood Decay A212 Bark and Sapwood Decay A212 Bark and Sapwood Decay A211 Heartwood Decay
<b>Site 11</b>			
May Sweep	None	<i>Dictenidia bimaculata</i>	A211 Heartwood Decay
September Sweep	None	None	
<b>Site 12</b>			
May Sweep	None	<i>Tetrops praeustus</i> <i>Grammoptera ruficornis</i>	A212 Bark and Sapwood Decay A212 Bark and Sapwood Decay
<b>Site 13</b>			
May Sweep	None	<i>Dasytes aeratus</i>	A212 Bark and Sapwood Decay
<b>Site 14</b>			
September Sweep		<i>Corizus hyoscyami</i>	F111 Bare Sand and Chalk
<b>Site 15</b>			
September Sweep	<i>Walckenaeria furcillata</i> (LC, NS)	None	
<b>Site 16</b>			
September Sweep	None	None	
<b>Site 17</b>			
September Sweep	None	None	

4.2.2 A detailed breakdown of survey results showing species with broad and specialist habitat affinities is shown in Table 4.2. Within this table the numbers of specialist species are listed under 'SAT' (Specific Assemblage Type), more generalist species with only broad habitat association as 'BAT' (Broad Assemblage Type). The Index

of Ecological Continuity (IEC) is the score for dead wood habitat, with a score of >15 denoting sites of Regional value (based on a comprehensive site inventory).

**Table 4.2: Invertebrate assemblage results**

<b>Site 1: May sweep</b>						
<b>SAT code</b>	<b>SAT name</b>		<b>No. spp.</b>	<b>Condition</b>	<b>Percentage of national species pool</b>	<b>Related BAT rarity score</b>
N/A	-		-	--		-
<b>BAT code</b>	<b>BAT name</b>	<b>Representation (1-100)</b>	<b>Rarity score</b>	<b>Condition</b>	<b>BAT species richness</b>	<b>IEC</b>
F2	grassland & scrub matrix	25	-	-	1	-
F3	shaded field & ground layer	25	-	-	1	-
A1	arboreal canopy	25	-	-	1	-
<b>Site 1: May intercept</b>						
<b>SAT code</b>	<b>SAT name</b>		<b>No. spp.</b>	<b>Condition</b>	<b>Percentage of national species pool</b>	<b>Related BAT rarity score</b>
A213	fungal fruiting bodies		1	-	1	-
A212	bark & sapwood decay		1	-	0	-
<b>BAT code</b>	<b>BAT name</b>	<b>Representation (1-100)</b>	<b>Rarity score</b>	<b>Condition</b>	<b>BAT species richness</b>	<b>IEC</b>
F2	grassland & scrub matrix	33	-	-	2	-
A2	wood decay	33	-	-	2	0
F3	shaded field & ground layer	17	-	-	1	-
<b>Site 1: September sweep</b>						
<b>SAT code</b>	<b>SAT name</b>		<b>No. spp.</b>	<b>Condition</b>	<b>Percentage of national species pool</b>	<b>Related BAT rarity score</b>
N/A	-		-	-	-	-
<b>BAT code</b>	<b>BAT name</b>	<b>Representation (1-100)</b>	<b>Rarity score</b>	<b>Condition</b>	<b>BAT species richness</b>	<b>IEC</b>
F2	grassland & scrub matrix	50	-	-	3	-



F3	shaded field & ground layer	17	-	-	1	-
<b>Site 2: May sweep</b>						
SAT code	SAT name		No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
A212	bark & sapwood decay		1	-	0	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	50	-	-	5	-
A1	arboreal canopy	30	-	-	3	-
A2	wood decay	10	-	-	1	0
<b>Site 2: May intercept</b>						
SAT code	SAT name		No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
A212	bark & sapwood decay		4	-	1	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
A2	wood decay	50	-	-	4	0
A1	arboreal canopy	12	-	-	1	-
<b>Site 2: September sweep</b>						
SAT code	SAT name		No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
N/A	-	-	-	-	-	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	33	-	-	3	-
W2	mineral marsh & open water	11	-	-	1	-
W3	permanent wet mire	11	-	-	1	-

Site 3: May sweep						
SAT code	SAT name		No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
A212	bark & sapwood decay		1	-	0	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	56	-	-	5	-
F1	unshaded early successional mosaic	11	-	-	1	-
A2	wood decay	11	-	-	1	0
W3	permanent wet mire	11	-	-	1	-
Site 3: September sweep						
SAT code	SAT name		No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
N/A	-		-	-	-	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	38	-	-	5	-
F3	shaded field & ground layer	15	-	-	2	-
A1	arboreal canopy	8	-	-	1	-
Site 4: May sweep						
SAT code	SAT name		No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
A212	bark & sapwood decay		1	-	0	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F3	shaded field & ground layer	25	-	-	1	-
A1	arboreal canopy	25	-	-	1	-

A2	wood decay	25	-	-	1	0
<b>Site 4: September sweep</b>						
SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score	
N/A	-	-	-	-	-	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	55	-	-	11	-
A1	arboreal canopy	15	-	-	3	-
W3	permanent wet mire	10	-	-	2	-
<b>Site 5: May sweep</b>						
SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score	
N/A	-	-	-	-	-	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
A1	arboreal canopy	37	-	-	7	-
F2	grassland & scrub matrix	26	-	-	5	-
F3	shaded field & ground layer	5	-	-	1	-
W2	mineral marsh & open water	5	-	-	1	-
<b>Site 5: September sweep</b>						
SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score	
N/A	-	-	-	-	-	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F3	shaded field & ground layer	37	-	-	3	-
F2	grassland & scrub matrix	12	-	-	1	-

Site 6: May sweep						
SAT code	SAT name		No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
W114	stream and river margin	-	1	-	2	-
A212	bark & sapwood decay	-	2	-	0	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	39	-	-	7	-
F3	shaded field & ground layer	11	-	-	2	-
A2	wood decay	11	-	-	2	0
A1	arboreal canopy	6	-	-	1	-
W1	flowing water	6	-	-	1	-
W2	mineral marsh & open water	6	-	-	1	-
Site 6: September sweep						
SAT code	SAT name		No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
A211	heartwood decay	-	1	-	1	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
A1	arboreal canopy	18	-	-	2	--
F1	unshaded early successional mosaic	9	-	-	1	-
F2	grassland & scrub matrix	9	-	-	1	-
F3	shaded field & ground layer	9	-	-	1	-
A2	wood decay	9	-	-	1	0

<b>Site 7: May sweep</b>						
<b>SAT code</b>	<b>SAT name</b>		<b>No. spp.</b>	<b>Condition</b>	<b>Percentage of national species pool</b>	<b>Related BAT rarity score</b>
F112	open short sward		1	-	1	-
<b>BAT code</b>	<b>BAT name</b>	<b>Representation (1-100)</b>	<b>Rarity score</b>	<b>Condition</b>	<b>BAT species richness</b>	<b>IEC</b>
F2	grassland & scrub matrix	73	-	-	11	-
A1	arboreal canopy	13	-	-	2	-
F1	unshaded early successional mosaic	7	-	-	1	-
<b>Site 8: May sweep</b>						
<b>SAT code</b>	<b>SAT name</b>		<b>No. spp.</b>	<b>Condition</b>	<b>Percentage of national species pool</b>	<b>Related BAT rarity score</b>
A212	bark & sapwood decay		2	-	0	-
<b>BAT code</b>	<b>BAT name</b>	<b>Representation (1-100)</b>	<b>Rarity score</b>	<b>Condition</b>	<b>BAT species richness</b>	<b>IEC</b>
F2	grassland & scrub matrix	68	-	-	15	-
F1	unshaded early successional mosaic	9	-	-	2	-
A2	wood decay	9	-	-	2	0
A1	arboreal canopy	5	-	-	1	-
<b>Site 9: May sweep</b>						
<b>SAT code</b>	<b>SAT name</b>		<b>No. spp.</b>	<b>Condition</b>	<b>Percentage of national species pool</b>	<b>Related BAT rarity score</b>
A212	bark & sapwood decay		2	-	0	-
<b>BAT code</b>	<b>BAT name</b>	<b>Representation (1-100)</b>	<b>Rarity score</b>	<b>Condition</b>	<b>BAT species richness</b>	<b>IEC</b>
F2	grassland & scrub matrix	69	-	-	9	-
A2	wood decay	15	-	-	2	1

F1	unshaded early successional mosaic	8	-	-	1	--
<b>Site 9: May intercept</b>						
SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score	
A213	fungal fruiting bodies	1	-	1	-	
A212	bark & sapwood decay	4	-	1	-	
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	42	-	-	5	-
A2	wood decay	42	-	-	5	2
A1	arboreal canopy	17	-	-	2	-
<b>Site 9: September sweep</b>						
SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score	
N/A	-	-	-	-	-	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	30	-	-	3	-
<b>Site 10: May sweep</b>						
SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score	
A212	bark & sapwood decay	3	-	1	-	
A211	heartwood decay	1	-	1	-	
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	50	-	-	13	-
A2	wood decay	15	-	-	4	4

F1	unshaded early successional mosaic	4	-	-	1	-
A1	arboreal canopy	4	-	-	1	-
W2	mineral marsh & open water	4	-	-	1	-
W3	permanent wet mire	4	-	-	1	-
<b>Site 11: May sweep</b>						
SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score	
A211	heartwood decay	1	-	1	-	
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	50	-	-	5	-
F1	unshaded early successional mosaic	10	-	-	1	-
A1	arboreal canopy	10	-	-	1	-
A2	wood decay	10	-	-	1	0
<b>Site 11: September sweep</b>						
SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score	
N/A	-	-	-	-	-	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	56	-	-	10	-
A1	arboreal canopy	11	-	-	2	-
F3	shaded field & ground layer	6	-	-	1	-
W3	permanent wet mire	6	-	-	1	-
<b>Site 12: May sweep</b>						
SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score	

A212	bark & sapwood decay		2	-	0	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	57	-	-	8	-
A1	arboreal canopy	14	-	-	2	-
A2	wood decay	14	-	-	2	0
<b>Site 13: May sweep</b>						
SAT code	SAT name		No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
A212	bark & sapwood decay		1	-	0	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	67	-	-	6	-
A2	wood decay	11	-	-	1	0
<b>Site 14: September sweep</b>						
SAT code	SAT name		No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
F111	bare sand & chalk	-	1	-	0	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	47	-	-	7	-
F1	unshaded early successional mosaic	7	-	-	1	-
F3	shaded field & ground layer	7	-	-	1	-
<b>Site 15: September sweep</b>						
SAT code	SAT name		No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
N/A	-	-	-	-	-	-



BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	31	-	-	5	-
F3	shaded field & ground layer	25	-	-	4	-
A1	arboreal canopy	6	-	-	1	-
<b>Site 16: September sweep</b>						
SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score	
N/A	-	-	-	-	-	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F3	shaded field & ground layer	29	-	-	2	-
F2	grassland & scrub matrix	14	-	-	1	-
A1	arboreal canopy	14	-	-	1	-
<b>Site 17: September sweep</b>						
SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score	
N/A	-	-	-	-	-	-
BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
A1	arboreal canopy	22	-	-	2	-
F2	grassland & scrub matrix	11	-	-	1	-
F3	shaded field & ground layer	11	-	-	1	-

## 4.3 Nature conservation evaluation

4.3.1 The nature conservation evaluation of the surveyed sites is shown in Table 4.3. Sites that are close together and related are assessed as groups.

**Table 4.3: Nature conservation evaluation of surveyed sites**

Feature	Description	Baseline Evaluation	Significance
<b>Sites 1, 2 and 3</b>	Linear strip of broadleaved plantation along A460, Cannock Road.	Two notable species and several species in specialist habitat bark and sapwood decay. One of the notable species ( <i>Pityogenes quadridens</i> ) is out of its natural range (its host tree is Scots pine).	<b>Local.</b> The site is small and disturbed. Of two notable species recorded, one is outside its natural range. The presence of several specialist species indicates local significance.
<b>Site 4</b>	Brookfield Farm, Shareshill LWS/SBI. Marsh.	A single specialist species only.	<b>Local.</b> This area of wetland appears to be too local and/or isolated to have maintained a significant fauna.
<b>Sites 5 and 6</b>	Brookfield Farm, Shareshill LWS/SBI. Semi-natural broadleaved woodland, some of it ancient.	Three species of conservation concern and several specialists. Site 6 richer than site 5.	<b>District.</b> Three species of conservation concern including one RDB3 (VU) species; <i>Ochrosia ventralis</i> , a flea beetle. However, the site is relatively small and isolated in the landscape.
<b>Site 7</b>	Grassland.	Three species of conservation concern recorded including one species with specialist habitat requirements for F112 open short sward.	<b>District.</b> Although a single specimen of an RDB3 (VU) species was recorded; <i>Ochrosia ventralis</i> , a flea beetle, it is unclear whether this is a permanent population. The site is relatively small and isolated within the landscape.
<b>Sites 8 and 9</b>	Poor semi-improved grassland, hedgerow, woodland edge.	Five notable species recorded across the two sites, with several specialists in bark and sapwood and fungal fruiting bodies.	<b>District.</b> Does not qualify as County because the populations of notable species are likely to be small in number and part of wider populations, including mobile blossom feeders.

Feature	Description	Baseline Evaluation	Significance
<b>Site 10</b>	Hilton Hall woodland.	Three species of conservation concern recorded, and four species with specialist deadwood habitat requirements.	<b>District.</b> With a single specimen of an RDB3 (VU) species; <i>Globicornis rufitarsis</i> , a skin beetle, with specialist habitat Heartwood Decay recorded and three other specialists on Bark and Sapwood Decay, this site exceeds Local significance, but it does not reach County because of its small size the populations are likely to be part of wider spatially-structured populations and are unlikely to be viable in isolation.
<b>Sites 11 and 14</b>	Brookfield Farm, Shareshill LWS/SBI. Woodland fringe, improved grassland.	Two specialist species.	<b>Local.</b> Minor presence of specialist species.
<b>Site 12</b>	Woodland north of M6.	Two species with specialist deadwood habitat requirements.	<b>Local.</b> Minor presence of specialist species.
<b>Site 13</b>	Hilton Cross Business Park Woodland.	One species with specialist deadwood habitat requirements.	<b>Local.</b> Minor presence of specialist species.
<b>Sites 15 and 16</b>	Lower Pool LWS/SBI. Broadleaved plantation and ornamental fishing lakes.	One species of conservation concern.	<b>Local.</b> A single species of conservation concern and no specialist species.
<b>Site 17</b>	Linear semi-natural broadleaved woodland strip lining a trackway.	No species of conservation concern or specialists.	<b>Low.</b> A small area of habitat with no specialist species.

4.3.2 Four survey sites or groups of sites are assessed of District importance. The others are of local importance, with the exception of Site 17, which has low importance. Two sites of District importance (7 and 10) are outside the Scheme boundary, and two groups of sites of District importance (Sites 5 and 6 and Sites 8 and 9) are within the Scheme boundary.

## 5 Summary

- 5.1.1 Four survey sites/groups of sites have been assessed to be of District importance for their invertebrate assemblages. Other surveyed areas are assessed to be of Local or Low importance, and it is considered that un-surveyed areas (predominantly arable) would be of Low importance.

## 6 References

- Ref 1 Staffordshire Biodiversity Action Plan (2019).  
<http://www.sbap.org.uk/>
- Ref 2 Drake, C.M., Lott, D.A., Alexander, K.N.A. & Webb, J. (2007). *Surveying terrestrial and freshwater invertebrates for conservation evaluation. Natural England Research Report NERR005*. Natural England, Sheffield.
- Ref 3 Colin Plant Associates (2006). *EclA Guideline Comments*. Available from: [www.cieem.org.uk](http://www.cieem.org.uk) accessed 03 November 2019.
- Ref 4 Webb, J.R. & Lott, D.A. (2006). The development of ISIS: a habitat-based invertebrate assemblage classification system for assessing conservation interest in England. *Journal of Insect Conservation*, 10, 179-188.