

# A303 Sparkford to Ilchester Dualling Scheme TR010036

## 6.3 Environmental Statement Appendix 8.12 Brown Hairstreak Technical Report

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Planning Act 2008

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Forms and Procedure) Regulations 2009  
July 2018

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Infrastructure Planning

Planning Act 2008

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

**A303 Sparkford to Ilchester Dualling  
Scheme**

Development Consent Order 201[X]

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**6.3 Environmental Statement  
Appendix 8.12 Brown Hairstreak Technical Report**

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## Executive summary

The proposed A303 Sparkford to Ilchester Dualling scheme (hereafter referred to as 'the scheme') is to provide a continuous dual carriageway on the A303 linking the Podimore Bypass and the Sparkford Bypass.

ECOSA were commissioned by Mott McDonald Sweco Joint Venture to carry out a brown hairstreak *Thecla betulae* survey of the site to determine the presence or likely absence of the species, and to assess the impacts and effects of the scheme on this species. The main findings of the survey are:

- Brown hairstreak ovum were present in 49% of the hedgerows within the survey area. The construction of the scheme would result in the loss of suitable brown hairstreak habitat and may cause harm to brown hairstreak.
- Recommendations have been given for the compensation of lost habitat, planting of new hedgerows and management of blackthorn hedgerows.
- Enhancement recommendations have been made for brown hairstreak including the planting of native broadleaved trees and additional planting of blackthorn within new hedgerows.

# **1 Introduction**

## **1.1 Overview of the scheme**

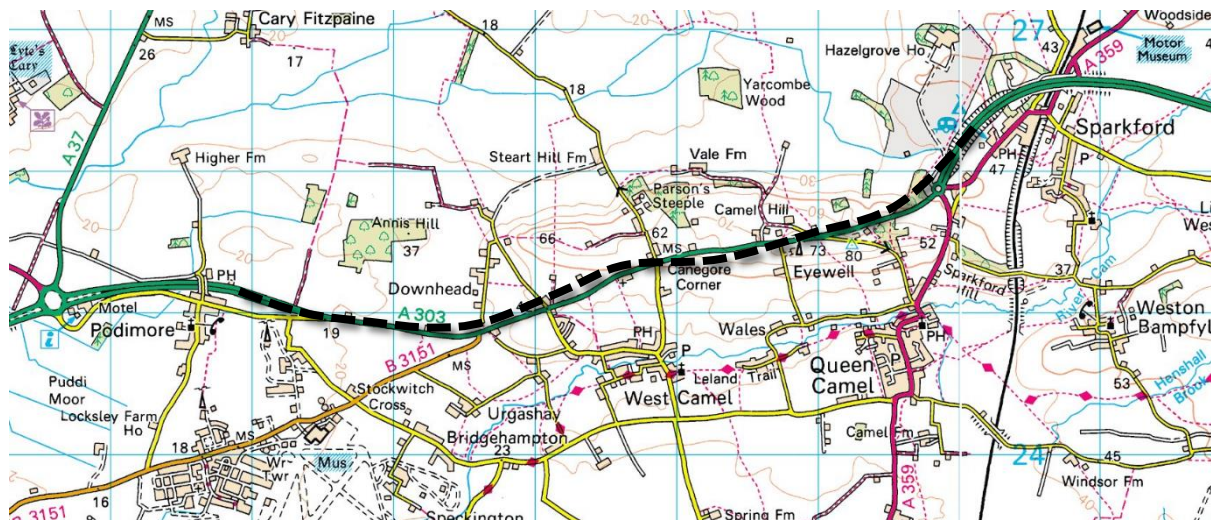
### **Existing corridor**

- 1.1.1 The A303 forms part of Highways England's Strategic Road Network (SRN) and a strategic link between the south west and the rest of the south, south-east and London. The route comprises multiple road standards, including dual carriageway, single carriageway and single carriageway sections with overtaking lanes. Speed limits also vary between 40 miles per hour and 70 miles per hour, depending on the character of the road and its surroundings.

### **Existing road**

- 1.1.2 The section of the A303 that is being upgraded as part of this scheme commences at the eastern limits of the existing dual carriageway, the Podimore Bypass. Travelling east, the corridor reaches the junction with the B3151 before bearing north east and rising upwards through Canegore Corner to reach the crest of Camel Hill at Eyewell. This section of the corridor is characterised by a single lane road, with double white lines negating overtaking and subject to a 50 miles per hour speed limit. There are several priority junctions along the route giving access to the settlements of Queen Camel and West Camel to the south and Downhead to the north, as well as several farm accesses and parking laybys.
- 1.1.3 From the crest of Camel Hill, the corridor descends to meet the roundabout at the western limit of the dual carriageway Sparkford Bypass (Hazlegrove Roundabout). This section comprises 2 lanes in the westbound direction, 1 lane in the eastbound direction and is also subject to a 50 miles per hour speed limit. Hazlegrove Roundabout forms a junction between the A303 and the A359 which runs south through Queen Camel and north-east through Sparkford. The roundabout also provides access to a service station, and to a school at Hazlegrove House.
- 1.1.4 The section of the A303 that is to be upgraded is almost 3.5 miles, or approximately 5.6 kilometres long.
- 1.1.5 The extents of the scheme are illustrated in Figure 1.1 of Volume 6.1 below. Figure 2.1 of Volume 6.2 shows the proposed red line boundary for the scheme.

Figure 1.1: Scheme extents



Source: Mott MacDonald Sweco Joint Venture

## Scheme proposals

1.1.6 The proposed scheme is to provide a continuous dual-carriageway linking the Podimore Bypass and the Sparkford Bypass. The scheme would involve the removal of at-grade junctions and direct accesses. The Hazlegrove Junction would be constructed to grade-separated standards and Downhead Junction and Camel Cross Junction would be constructed to compact grade-separated standards, as illustrated on Figure 2.3 General Arrangement Plans, contained in Volume 6.2.

1.1.7 A detailed description of the scheme is provided within Chapter 2 The Scheme of Volume 6.1.

## 1.2 Scope of report

1.2.1 The objectives of this report are:

- to inform the Environmental Impact Assessment (EIA)
- to present the results of the presence / absence surveys
- to assess the distribution of brown hairstreak populations
- to assess the potential impacts of the Scheme on brown hairstreak
- to provide recommendations for further mitigation, habitat creation and enhancement

## 1.3 Legislation

1.3.1 Brown hairstreak is listed under Section 41 of the *Natural Environment and Rural Communities (NERC) Act* in Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and is afforded limited protection under Section 9 of this Act (for sale only) and is a *UK Biodiversity Action Plan (BAP)* priority species.



1.3.2 Under Schedule 5 of the *Wildlife and Countryside Act 1981* it is illegal to:

- sell, offer for sale, possess or transport brown hairstreak for the purpose of selling
- advertise the buying or selling of brown hairstreak

## 1.4 Status of brown hairstreak at the national level

1.4.1 Brown hairstreak are widespread across the south of England and Wales, with strongholds in West Sussex, Surrey, Oxfordshire, Buckinghamshire, Somerset, North Devon and South Devon in England, and Cardiganshire and Carmarthenshire in Wales. Brown hairstreak populations have declined over the last 50 years, mainly as a result of hedgerow removal and flailing<sup>1,2</sup>.

1.4.2 Brown hairstreak is listed as a UKBAP species and is listed as a species of 'principal importance for the conservation of biodiversity in England' under Section 41 of the NERC Act 2006. Following the production of *Biodiversity 2020*<sup>3</sup>, the national strategy for England, actions were identified by experts to help in the recovery of populations of the S41 listed species. Actions identified for the recovery of brown hairstreak include the following:

- ensure known sites are managed appropriately, with blackthorn stands being managed on rotation
- site specific advice and action at named sites
- encourage monitoring at key sites, co-ordinate data and produce trend UK and national indicators
- increase the extent of suitably managed hedgerow and woodland

## 1.5 Status of brown hairstreak at county level

1.5.1 Although the UK BAP has been superseded, BAPs are still widely used at county level to support *Biodiversity 2020*. Brown hairstreak is not listed as a species on the Somerset BAP. However, hedgerows and hedgerow trees are listed as a Somerset BAP habitat, which benefits this species through habitat creation and maintaining habitat connectivity.

## 1.6 Brown hairstreak ecology

1.6.1 Brown hairstreak live in self-contained colonies within habitats that contain blackthorn, the larval food source, such as woodland and hedgerows. Brown

<sup>1</sup> Butterfly Conservation (n.d.g) *Brown Hairstreak* [online] available at: <https://butterfly-conservation.org/679-1309/brown-hairstreak.html> (last accessed April 2018).

<sup>2</sup> Joint Nature Conservation Committee (2010) *UK Priority Species data collation Thecla Betulae version 2* Joint Nature Conservation Committee. Peterborough.

<sup>3</sup> Defra (2011) *Biodiversity 2020: A strategy for England's wildlife and ecosystem services* [online] available at: <https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services> (last accessed April 2018)

hairstreak adults are found mostly around tall shrubs and trees but may come down to feed on flowers such as hemp-agrimony, bramble and common fleabane. While the colonies are mainly centred on woodlands, egg laying will occur over several square miles<sup>4,5</sup>.

- 1.6.2 Brown hairstreak lay their eggs on the twigs, suckers and shoots of blackthorn, towards the end of September. The ovum will lay dormant until May when the larval stage begins and caterpillars hatch. The caterpillars will feed on the leaves of blackthorn bushes until July when they enter the pupa stage. Adults will begin emerging from the pupa at the start of August and will remain on the wing into mid-October.

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<sup>4</sup> Bourn, N. A. D. & Warren, M. S. (1998) *Species Action Plan Brown Hairstreak Butterfly Conservation*. Wareham.

<sup>5</sup> Butterfly Conservation (2013) *Brown Hairstreak factsheet Butterfly Conservation*. Wareham.

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## **2 Methodology**

### **2.1 Desk study**

- 2.1.1 A detailed desk study search was requested from Somerset Environmental Records Centre (SERC) in May 2017, within a 2 kilometre radius of the scheme. The results can be found within appendix A.

### **2.2 Field survey**

- 2.2.1 The Zone of Influence of the scheme, with regard to brown hairstreak, comprised all potentially suitable hedgerow habitat within 50 metres of the scheme. This is the distance from the scheme that it was considered impacts to brown hairstreak could potentially arise.
- 2.2.2 A field survey for brown hairstreak ovum was carried out, rather than a butterfly transect focussed on searching for adult brown hairstreak. This is due to the fact that, during summer adult brown hairstreak occupy high tree canopies, with females coming down to lay the ovum, making them difficult to find. In the winter, only the brown hairstreak ovum is present.
- 2.2.3 The field survey followed the standard technique for brown hairstreak ovum searches. This involved checking the suckers and shoots of suitable blackthorn shrub within the previously identified hedgerows, by hand. Positions of brown hairstreak ovum were recorded using a suitable GPS device.
- 2.2.4 The surveys were undertaken over a 4 day period of 13 to 16 November 2017. They were carried out by suitably qualified entomologist and ecologists from ECOSA Ltd.
- 2.2.5 During the survey, surveyors were equipped with 10x magnification hand lenses and Garmin Oregon 400t GPS devices.

### **2.3 Survey constraints**

- 2.3.1 During the survey, full access to all suitable hedgerows was not possible, often due to landowners denying permission to access land. Hedgerows 10 and 11 could not be surveyed as access placed the surveyors at risk. As a result of the lack of access, these areas could not be surveyed for the presence or likely absence of brown hairstreak.

### 3 Results

#### 3.1 Presence or absence

3.1.1 Brown hairstreak ovum were recorded on a total of 31 hedgerows surveyed. Overall, approximately 49% of the hedgerows within the search area are confirmed to support brown hairstreak. The results of the survey are detailed in Table 3.1. Maps of the results of the survey are detailed in appendix B and appendix C.

Table 3.1: Results of brown hairstreak survey

Hedgerow No.	Brown hairstreak ovum recorded	Grid reference of ovum	Comments
1	Yes	ST 55172 25086	
2	No		Heavily flailed
2a	Yes	ST 55045 25006	
3a	Yes	ST 55293 25044	
4	Yes	ST 55390 25021	
5	No		Recently flailed
6	No		Recently flailed
7	Yes	ST 55659 24975	
8	Yes	ST 556544 25023	
9	Yes	ST 55778 24990	
10	Not Surveyed		Suitable but unable to access
11	Not Surveyed		Unable to access, would put surveyors at risk
12	No		
13	Yes		
14	Yes		
15	No		
16	Yes	ST 56505 24767	
17	Yes	ST 56379 24709	
18	No		No blackthorn present
18a	Yes	ST 56721 24824	
19	Not Surveyed		Missed during survey
20	Yes		
21	Yes	ST 56907 25248	
21a	Yes	ST 56965 25247	
22	No		
23	No		



Hedger ow No.	Brown hairstreak ovum recorded	Grid reference of ovum	Comments
24	Yes	ST 57061 25151	
25	Yes		
26	Yes	ST 57231 25187	
27	Yes	ST 57300 25277	
27a	No		
28	Yes		
29	Yes	ST 57433 25255	
29a	Yes		
30	Yes	ST 57433 25255	
30a	Yes	ST 57452 25190	
31	No		No blackthorn present
32	No		
33	No		No blackthorn present
34	No		No blackthorn present
35	Not Surveyed		Access denied
36	Yes	ST 5786225355	Access denied to northern sector. Ovum found at eastern corner of hedge bordering Howell Hill.
38	No		No blackthorn present
39	Yes	ST 58066 25428	
40	No		Access denied. Too dangerous to work on roadside
40a	Yes	ST 58088 25349	
41	Yes	ST 58521 25503	
42	Not Surveyed		Access denied
43	Yes	ST 58304 25404	
44	Not Surveyed		Access denied
45	No		
46	Yes	ST 58680 25601	
47	No		
47a	No		
48	No		
49	Not Surveyed		Access denied
50	Not Surveyed		Access denied
51	No		
52	No		No blackthorn present
52a	No		
53	Yes	ST 59361 25690	
53a	No		

- 
- 3.1.2 The results show that brown hairstreak was not present on any hedgerows that had been recently flailed. This is likely due to the fact that flailing removes the shoots and suckers where brown hairstreak will lay ovum, destroying any ovum present at the time of flailing. In addition to this, brown hairstreak was recorded on hedgerows with varying levels of blackthorn abundance including hedgerows where blackthorn was considered rare.
- 3.1.3 During the survey a number of blue bordered carpet moth *Plemyria rubiginata* ovum were recorded within surveyed hedgerows. Blue bordered carpet is not listed as a UK BAP species and is considered to be common and widespread.

## **4 Potential impacts**

### **4.1 Construction**

- 4.1.1 Vegetation clearance during construction would result in the loss of suitable brown hairstreak ovum laying habitat and may cause harm or disturbance to brown hairstreak.

### **4.2 Operation**

- 4.2.1 Annual flailing of roadside hedgerows may result in the loss of suitable brown hairstreak ovum laying habitat and may cause harm or disturbance to brown hairstreak if present within the blackthorn.

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## 5 Mitigation and enhancement recommendations

### 5.1 Mitigation

- 5.1.1 New hedgerows should be planted at an amount equivalent to hedgerow loss. The new hedgerows should incorporate native broadleaved trees with frequent or occasional blackthorn.
- 5.1.2 New hedgerow planting should ideally be undertaken prior to vegetation clearance to allow brown hairstreak to colonise new planting. The hedgerows should connect to existing hedgerows to retain the connectivity of the habitat and prevent habitat fragmentation.
- 5.1.3 Hedgerow removal should ideally be carried out in the winter months. Where possible, blackthorn bushes with brown hairstreak ovum should be translocated into new hedgerow planting. This should allow brown hairstreak to become established within new hedgerow planting while preventing the loss of brown hairstreak during vegetation clearance<sup>5</sup>.
- 5.1.4 Management of blackthorn hedges along the roadside should involve cutting of only 1 side of the hedgerow every other year to prevent local extinction of brown hairstreak. Cutting of hedgerows should be undertaken in early August, when eggs and larvae are less likely to be present within blackthorn, or in January and February<sup>6</sup>.

### 5.2 Enhancement

- 5.2.1 As an enhancement measure, additional blackthorn hedgerows should be planted to create new wildlife corridors and connect existing hedgerows together. In addition, blackthorn could be replanted at a higher ratio with blackthorn being replanted at a rate of twice the amount of blackthorn lost<sup>7</sup>.

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<sup>6</sup> Butterfly Conservation (2004) *Hedgerows for Hairstreaks* English Nature. Peterborough.

<sup>7</sup> Spalding, A. (2005) *The Butterfly Handbook: General advice note on mitigating the impacts of roads on butterfly populations* English Nature. Peterborough.

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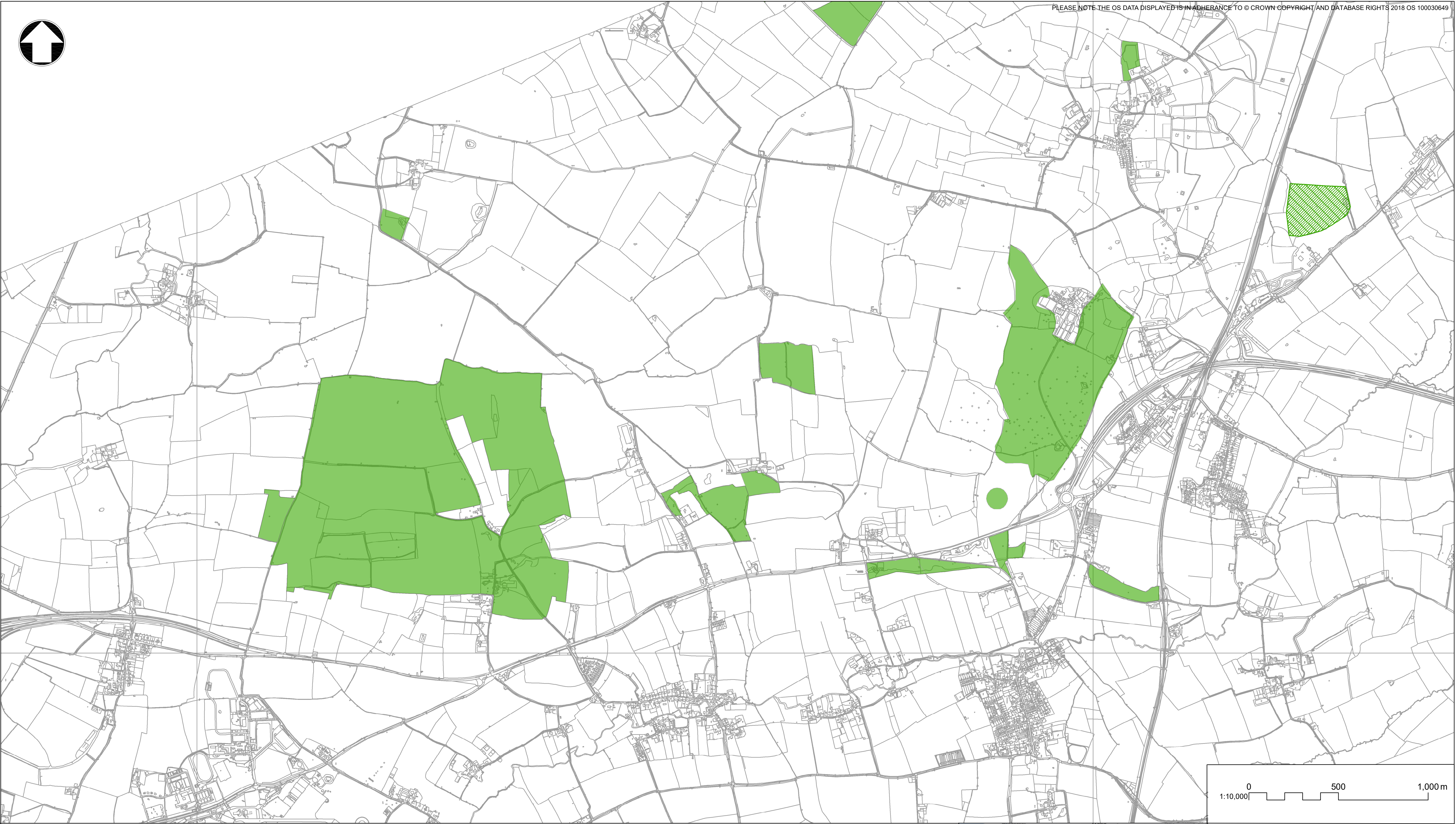


## **6 Conclusion**

- 6.1.1 The surveys found that brown hairstreak was present in approximately 49% of the hedgerows that would be affected by the scheme, and is likely to be present in the wider area due to the presence of suitable habitat.
- 6.1.2 The proposed works would result in the loss of suitable brown hairstreak habitat and may cause harm to the local population during vegetation clearance.
- 6.1.3 Recommendations have been given to compensate for the loss of blackthorn hedgerows and to allow brown hairstreak to colonise new hedgerow planting prior to vegetation clearance. Enhancement measures have been given to improve the area for brown hairstreak after development.

## **Appendix A: SERC biological records – Invertebrates and designated sites within 2 kilometres**

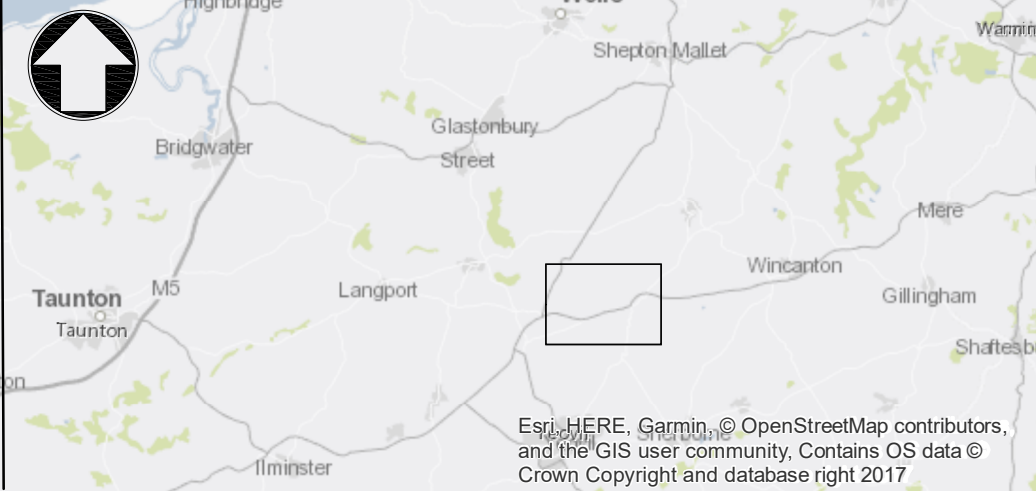




100  
90  
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70  
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- KEY
- LOCAL WILDLIFE SITES
  - SITES OF SPECIAL SCIENTIFIC INTEREST

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REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	JULY 2018	DCO SUBMISSION	ER	VC	ER

Project Title					
A303 SPARKFORD TO ILCHESTER DUALLING					
Drawing Title					
SOMERSET ENVIRONMENTAL RECORD CENTRE DATA DESIGNATED SITES					
Drawing Status					Suitability
Published - DEFINITION					A3
Scale	Designed	Drawn	Checked	Approved	
AS SHOWN	ER	ER	VC	ER	
Original Size	Date	Date	Date	Date	
A1	JULY 2018	JULY 2018	JULY 2018	JULY 2018	
Drawing Number					Project Ref. No.
HE 551507 - MMSJV - EBD					389107
Revision					C01
Location					
000 - DR - LB - 0085					
Type Role Number					



## **Appendix B: Brown hairstreak results west**





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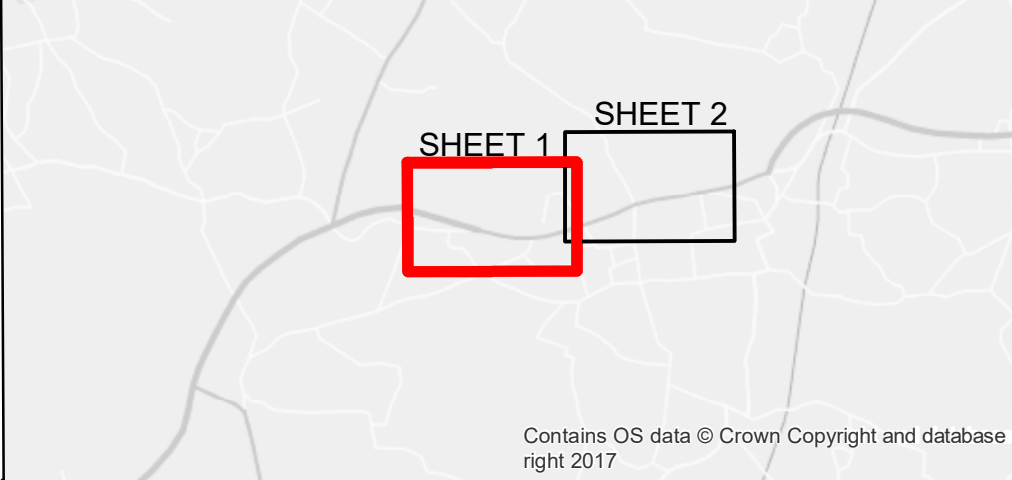
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KEY

BROWN HAIRSTREAK SURVEYED

- HEDGEROW SURVEYED, BROWN HAIRSTREAK ABSENT
- HEDGEROW SURVEYED, BROWN HAIRSTREAK PRESENT
- HEDGE GROW NOT SURVEYED - NO ACCESS PERMITTED
- HEDGEROW NOT SURVEYED - NO SAFE ACCESS

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SHEET 1

SHEET 2

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C01	JULY 2018	DCO SUBMISSION	ER	VC	ER
REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D

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Drawing Title BROWN HAIRSTREAK SURVEY RESULTS 2017 SHEET 1 OF 2					
Drawing Status Published - DEFINITION					Suitability A3
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000		- DR - LM - 0086		Project Ref. No. 389107	
Location		Type   Role   Number		Revision C01	



## **Appendix C: Brown hairstreak results east**





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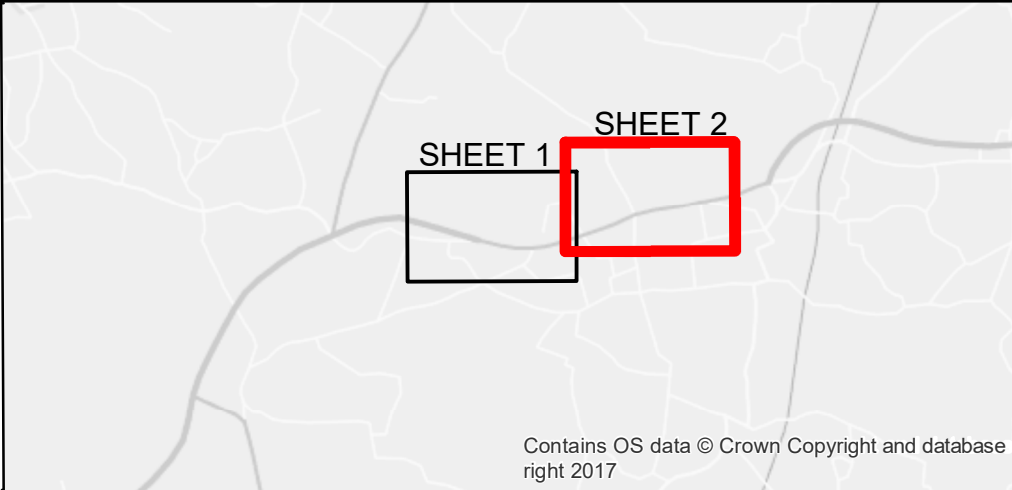
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KEY

BROWN HAIRSTREAK SURVEYED

- HEDGEROW SURVEYED, BROWN HAIRSTREAK ABSENT
- HEDGEROW SURVEYED, BROWN HAIRSTREAK PRESENT
- HEDGEGROW NOT SURVEYED - NO ACCESS PERMITTED
- HEDGEROW NOT SURVEYED - NO SAFE ACCESS

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C01	JULY 2018	DCO SUBMISSION	ER	VC	ER
REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D

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