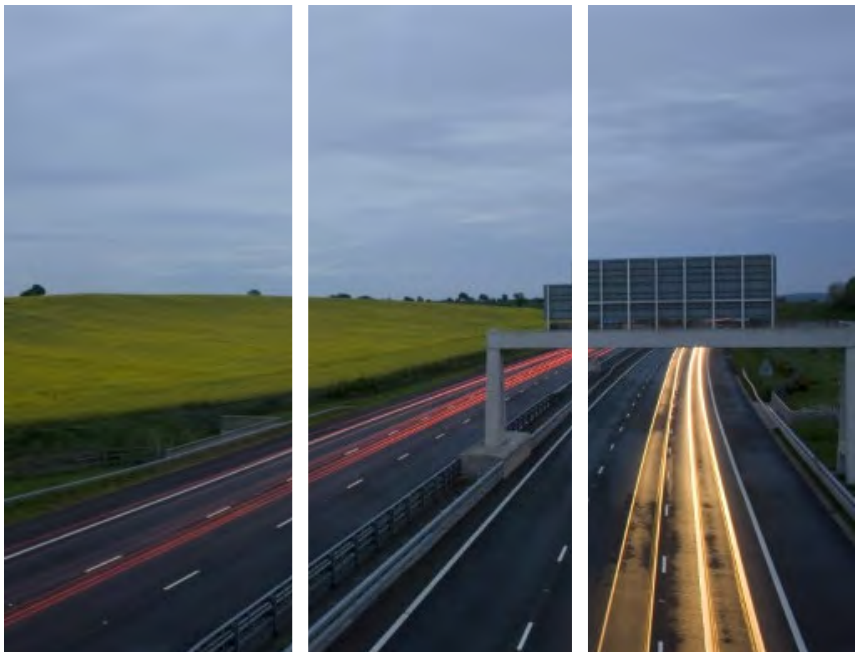

A358 Taunton to Southfields

Preliminary Ecological Appraisal (PEA)

360467-09-300-RE-001-01

June 2016

Highways England

Mott MacDonald
Sweco

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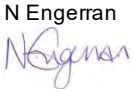

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Contents

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Executive Summary

Mott MacDonald Limited has been commissioned by Highways England to undertake a rapid Extended Phase 1 Habitat survey for a road improvement scheme of the A358 from Taunton to Southfields. This report presents the findings of the survey in a Preliminary Ecological Appraisal (PEA) for the project and assesse four different route options, referred to within this report as Options 1, 2/2D, 8A/8B and 13.

The Extended Phase 1 Habitat survey was carried out by suitably qualified ecologists between March and April 2016 and a desktop survey conducted. Using this information, this report provides an initial assessment of the ecological importance of the site's habitats, the potential for protected species and to determine the requirement for targeted Phase 2 surveys.

The Phase 1 Habitat Survey Identified suitable habitats for the following species, at all Options:

- Bats;
- Nesting birds;
- Badgers;
- Dormouse;
- Great Crested Newts (GCN);
- Water voles and Otters;
- Fish;
- Terrestrial and Aquatic Invertebrates;
- Barn Owl;
- Kingfishers;
- White Clawed Crayfish; and,
- Reptiles.

Ecological surveys for the above species are recommended to determine the presence or likely absence from site. Additionally, due to the time of year of the initial assessment, further habitat surveys including hedgerow surveys and Grassland and Woodland National Vegetation Classification (NVC) surveys are recommended.

1 Introduction

1.1 Background to the Scheme

The A303/A30 is part of the Strategic Road Network and together with the A358 forms a key strategic link between the South West Peninsular (SWP) and the rest of the south, south east and London. Although it is dualled over much of its length there are several unimproved single carriageway sections between the M3 motorway at Basingstoke and the M5 at Taunton and Exeter which cause congestion, especially during summer weekends. The A303 also passes in close proximity to the Stonehenge World Heritage Site (WHS) and through the Cranborne Chase and West Wiltshire Downs and Blackdown Hills Areas of Outstanding Natural Beauty (AONB).

In addition to its importance as a key strategic link it also has significant importance linking the local road network and facilitating many shorter distance journeys between the main population and employment centres along and adjacent to the route (Andover, Amesbury, Shaftesbury, Yeovil, Honiton and Exeter) and provides the key link connecting the SWP to England providing one of the main conduits for business and economic growth for the south west. Due to the population density, employment opportunities, urban concentrations and tourist attraction of the SWP the A303/A30/A358 corridor experiences a wide range of traffic flows which lead directly to severe and regular instances of congestion and delay.

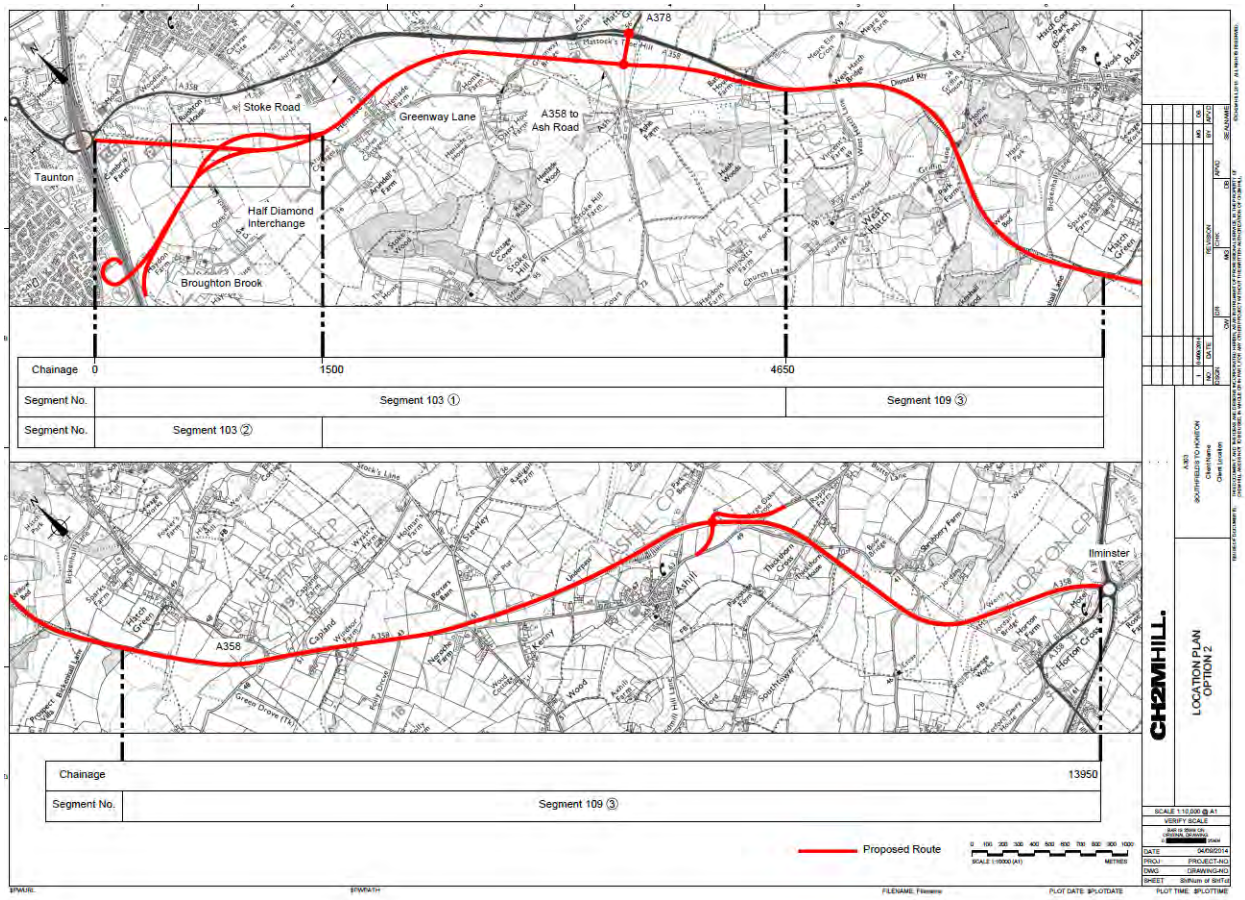
The existing road is predominantly single carriageway with a short (1.75km) dual carriageway section in the vicinity of Thornfalcon and a 3 lane (2+1) section (0.5km) immediately to the south of that. It has many side roads and private accesses directly onto it. The national speed limit applies between Southfields and Henlade where it reduces to 30mph; the speed limit increases to 40mph north of Henlade on the approach to M5 junction 25.

Further information is available in the Road Investment Strategy (RIS) for the 2015/16 to 2019/2020 road period.

1.2 Scheme Location

The existing A358 is an approximately 14km long road located in the south west of England and connects the A303 at Ilminster with the M5 Junction 25, to the south of Taunton. This road is primarily single carriageway throughout, with short lengths of dual carriageway at Henlade and the M5 Junction 25 gyratory. A plan showing the Scheme extents has been provided in Figure 1.1.

Figure 1.1: Announced Scheme Layout from Strategic Outline Business Case



Source: Strategic Outline Business Case, CH2MHill, January 2015

1.3 Description of Scheme Options

Currently, four Scheme options are under consideration. A description of each of the proposed options is provided below. All of the proposed options are identified on the Environmental Constraints Plan contained within Appendix A.

1.3.1 Option 1

Option 1 would be entirely offline. It would connect to the M5 approximately 4km south of Junction 25, cross the existing A358 approximately half way along its length and then take a route north of the existing A358 until it would tie into the existing A303 Ilminster Bypass.

This option would connect to the M5 Motorway at a three-way all movements grade separated junction approximately 4km south of Junction 25, adjacent to Taunton Racecourse. Initially the new mainline would

take a south-easterly course to run south of the racecourse before bearing northwards to avoid the Blackdown Hills Area of Outstanding Natural Beauty. The route would take an arching course between the Blackdown Hills and the villages of Slough Green and Thurlbear. At Bickenhall the mainline would then bear east to cross over the existing A358 carriageway just south of Hatch Green. The route would then pass through the Hatch Green Fields Local Wildlife Site (LWS) before turning south east to meet up with the route of the dismantled Chard Branch Line adjacent to the Merryfield Airfield. The mainline would then follow the Chard Branch Line southwards for approximately 2km before turning east and connecting to the existing A303 Ilminster Bypass 1.5km north of the town. The limits of the works here are expected to be at the existing B3168 Overbridge.

1.3.2 Option 2/2D

This route option would provide a partial offline/online route, the online section being between Bickenhall Wood and Ashill. A unique feature of this option is that traffic wishing to interchange between the mainline and Junction 25 will do so via a junction located somewhere along the online section. Option 2/2D commences at the M5 approximately 2km south of Junction 25. South facing interchange links commence just north of Shoreditch Road Overbridge and pass over the M5 carriageway to become the new mainline, which would initially pass south of Haydon and north of Stoke Wood. The route would then cut through Stoke Hill, pass south of Diary House Farm and Ash Farm and then take a south easterly course past West Hatch before meeting up with the route of the existing A358 at Bickenhall Wood. The mainline would then follow the existing A358 route for 4.5km, including the Ashill Bypass. As the A358 turns southwards after Ashill the proposed mainline would continue on an easterly course to the north of Rapps, crossing the line of the dismantled Chard Branch Line and then meeting up with the existing A303 Ilminster Bypass 1.5km north of the town. The limits of the works here are expected to be at the existing B3168 Overbridge.

The route described above would not provide a facility for mainline traffic to gain access to Taunton or to join the M5 northbound. As such a junction will be provided at some point along the online section between Bickenhall Wood and Ashill so that traffic can interchange between the mainline and the existing A358. Once on the A358 traffic will be able to follow the existing route to Junction 25. It is proposed that a new 3km long dual carriageway southern bypass of Henlade is constructed as part of this option in order to relieve congestion through Henlade. This bypass will connect the existing A358 dual carriageway section at Mattock's Tree Hill and Junction 25 (via a roundabout and link road that are proposed as part of the strategic development adjacent to Junction 25). This bypass will pass under Stoke Road between the residential properties of Meadow View and Henlade Farmhouse.

1.3.3 Options 8A/8B

The option 8A/8B would provide a partial offline/online route, the online section being between Bickenhall Wood and Ashill. A unique feature of this option is that it also aims to follow the existing A358 corridor to the west of Hatch Beauchamp as much as geometric design standards will allow in order to minimise land-take and earthworks in this area.

Option 8A/8B would commence at the M5 approximately 2km south of Junction 25. South facing interchange links would commence just north of Shoreditch Road Overbridge and pass over the M5 carriageway to become the new mainline, which would initially pass south of Haydon and north of Stoke Wood. At Stoke Hill a junction is proposed which would allow traffic to interchange between the mainline and Junction 25 via a new 2km dual carriageway link which would connect to a roundabout and link road that are proposed as part of the strategic development adjacent to Junction 25. The mainline would then continue in a south easterly direction for 2.5km passing to the south of Diary House Farm, Ashe Farm, skirting the northern boundary of Huish Copse and Strangeways Copse and then joining up with the existing A358 corridor to the west of Hatch Beauchamp. The route would then follow the 'S' bends of the Hatch Beauchamp Bypass as closely as geometric design standards will allow and then follows the route of the existing A358 for a further 4.5km until east of Ashill. As the A358 turns southwards after Ashill the proposed mainline would continue on an easterly course to the north of Rapps, crossing the line of the dismantled Chard Branch Line and then meeting up with the existing A303 Ilminster Bypass 1.5km north of the town. The limits of the works here are expected to be at the existing B3168 Overbridge.

1.3.4 Option 13

This option would provide a partial offline/online route, the online section being between Bickenhall Wood and just east of Ashill. A unique feature of this option is that it follows a route to the south of the village of West Hatch.

Option 13 would commence at the M5 approximately 2km south of Junction 25. South facing interchange links would commence just north of Shoreditch Road Overbridge and pass over the M5 carriageway to become the new mainline, which would initially pass south of Haydon and north of Stoke Wood. At Stoke Hill a junction is proposed which would allow traffic to interchange between the mainline and Junction 25 via a new 2km dual carriageway link which would connect to a roundabout and link road that are proposed as part of the strategic development adjacent to Junction 25. The mainline would then continue in a south easterly direction for 2.5km passing to the south of Diary House Farm, south of Ashe Farm and then south of Huish Woods. The route would then takes an arcing course around the south of the village of West Hatch and north of Bickenhall Wood before meeting up with the existing A358 carriageway to the south of Hatch Beauchamp, which it would follow for a further 4.5km. To the east of Ashill the proposed mainline would turn southwards to follow the existing A358 briefly before moving north of the existing carriageway, passing through the grounds of Jordans and following an arcing course to bypass the existing Southfields Roundabout to the north. The route would connect to the existing A303 Ilminster Bypass approximately 1km north of Southfields Roundabout.

1.4 Scope of Report

This report aims to inform the baseline ecology for the four proposed route options (1, 2/2D, 8A/8B, 13) as part of the A358 Taunton to Ilchester road improvement scheme (the Scheme).

The objectives of this report are to:

- Identify habitats and designated sites within the Zone of Influence (ZoI);

- Assess the likelihood of protected species being present on, near or adjacent to proposed works;
- Assess the nature conservation of the site; and;
- Provide recommendations on further survey requirements.

1.5 Study Area and Zone of Influence

The current guidance on ecological assessments recommends that all ecological features that occur within a zone of influence (ZoI) for a proposed Scheme are investigated (IEEM, 2006). The potential ZoI includes:

- Areas to be directly within the land take for the proposed Scheme and access;
- Areas that will be temporarily effected during construction;
- Areas likely to be impacted by hydrological disruption, and,
- Areas where there is a risk of pollution and noise disturbance during construction and/or operation.

The ZoI is normally variable, depending on the ecological features concerned. With regard to the habitats and protected/notable species likely to be affected by the proposed options, the ZoI has been defined as land within 500m of the central line for each Option. Due to each options location, Options 2/2D, 8A/8B and 13 were surveyed together as they have a similar ZoI and often follow the same route on or close to the A358, whilst Option 1, which is a new offline road, was surveyed separately.

The search for designated sites and historical biological records extended up to a 2km radius around the proposed option areas, with the exception of land to the west of the M5, where a 250m radius search was conducted due to the urban nature of this area as well as extending to 30km for Special Areas of Conservation (SACs) designated for bats.

2 Legislative and Policy Framework

2.1 European Legislation and International Conventions

The construction and operational activities for the development should comply with International and European legislation. The following EC Directives and international conventions are relevant to the ecological assessment:

- Convention on Biological Diversity 1992;
- Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979);
- Bonn Convention on the Conservation of Migratory Species of Wild Animals (1979);
- Ramsar Convention on Wetlands 1971;
- EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitat Directive 1992) as amended (92/43/EEC); and,
- EC Directive on the Conservation of Wild Birds (Birds Directive 1979) as amended (79/409/EEC).

2.2 National

The construction and operational activities must comply with UK nature conversation legislation, and with national and local biodiversity policies. The key national policies which influence the ecology and nature conservation assessments are:

- The Conservation of Habitats and Species Regulations (2012 as amended);
- Wildlife and Countryside Act (W&CA) 1981 (as amended);
- The Natural Environmental and Rural Communities (NERC) Act 2006;
- National Planning Policy Framework (NPPF) (March 2012); and,
- UK Biodiversity Action Plan (UKBAP). The relevant local biodiversity plan is the Kent Biodiversity Action Plan (KBAP). The relevant local biodiversity plan is Wild Somerset, The Somerset Biodiversity Strategy (2008).

The Natural Environment and Rural Communities Act 2006 requires public bodies, including local authorities, 'to have regard to the conservation of biodiversity in England' when carrying out their normal functions. Also under this Act a list of species of 'principal importance to biodiversity within England' was drawn up which acts as an aid to guide public bodies in implementing their duty.

The National Planning Policy Framework (NPPF) relates to conserving and enhancing the natural environment, requires Local Authorities in England to take measures to:

- Conserve and enhance biodiversity;
- Protect the habitats of these species from further decline;
- Protect the species from the adverse effect of development; and,
- Refuse planning permission for development, if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for.

The UK Post-2010 Biodiversity Framework covers the period 2011 - 2020 and replaced the UK Biodiversity Action Plan (UKBAP) 1994 – 2010. Its aim is to address the underlying causes of biodiversity loss and

improve and enhance biodiversity and ecosystem services. The UKBAP priority habitats and species background information is still widely used at country level.

2.3 Local Policy

Taunton and Dean Local Plan

The Taunton Deane Local Plan forms the detailed part of the Development Plan for Taunton Deane. It provides a realistic and comprehensive basis for development, investment and related decisions for the Borough for the period to 2011. The environmental objectives of the plan are to:

- To minimise the pollution of air, water and land.
- To protect and improve the landscape quality and character of the countryside.
- To protect and improve the quality and character of settlements.
- To preserve and enhance the historical, geological and cultural heritage.
- To maintain and enhance biodiversity.
- To minimise the use of non-renewable resources including fossil fuels, minerals, water and the best agricultural land.
- To control the location and design of development to reduce the need to travel.
- To seek a more sustainable and balanced transport system based upon reduced dependence on the car and increased emphasis on energy efficiency, public safety, public transport, cycling and walking.
- To ensure the use of good design and materials which respect and enhance local character and distinctiveness.
- To promote the reduction, re-use and recycling of waste.

The Somerset Biodiversity Strategy

The Somerset Biodiversity Strategy is intended to represent a long term blueprint for successful biodiversity conservation in Somerset. It proposes a vision and long term goals for biodiversity conservation locally and sets out a series of objectives and actions aimed at making significant progress towards achieving them. The Biodiversity Partnership proposes the following vision for the natural environment and biodiversity of Somerset for present and future generations of Somerset people live in a place where:

- The natural diversity and functions of our land and marine ecosystems have been restored and are maintained in a healthy condition for people and nature.
- Habitats and species exist at sufficient levels to ensure that they will stand the best chance of remaining viable far into the future.
- The richness of nature can be experienced at first hand across the entire rural and urban landscape.
- The physical and emotional connections between people and the natural environment are restored and strengthened.
- Future development is truly sustainable and the best is always made of opportunities for habitat restoration and enhancement.

Legislation and policies specific to individual species and or habitats likely to be present on site are presented in Appendix B.

Taunton and Dean Local Biodiversity Action Plan

The Taunton and Dean Local Biodiversity Action Plan sets out to review the biodiversity resource within the District, evaluate its importance within a local and national context and identify priority actions that need to be taken to conserve local biodiversity. The plan complements the new Somerset Countywide Biodiversity Strategy.

3 Methodology

3.1 Desk Study

A detailed desk study was undertaken on the 19th February utilising online databases including Multi-Agency Geographic Information for the Countryside (MAGIC), local council websites and the Joint Nature Conservation Committee (JNCC) were consulted to identify the location of statutory and non-statutory designated sites up to 2km radius of the route options and 30km to identify sites designated for bats.

A detailed data search from the Somerset Environmental Records Centre (SERC) was undertaken in April 2016 and considered designated sites and protected species records up to a 2km radius of the proposed Scheme with the exception of land to the west of the M5, where a 250m buffer was put in place due to the urban nature of this area. The results can be found in Appendix C. A review of OS maps was also undertaken to identify ponds within 500m of each route option.

3.2 Phase 1 Habitat Survey

The field survey concentrated on a 500m radius from the central line for each option. Options 2/2D, 8A/8B and 13 were surveyed together as they often follow the same route on or close to the A358, whilst Option 1, which is a new offline road, was surveyed separately.

The site was initially visited in 2016 on the 21st to 23rd March , then 04th April to 06th April and finally 18th to 19th April by four Mott MacDonald Sweco JV ecologists. An initial rapid Phase 1 Habitat assessment was undertaken and the broad habitat types were identified and mapped in accordance with the Handbook for Phase 1 Habitat Survey (JNCC, 2010). Its use is recommended in the Design Manual for Roads and Bridges, Volume 11, Environmental Assessment.

Habitats within the ZoI were classified according to the JNCC habitat types and all species of flora, fauna and areas of particular conservation interest were noted. Where possible, plant species were identified to species level and species lists were compiled and incorporated into the Phase 1 Habitat Survey target notes. The Phase 1 Habitat map is shown in Appendix D, together with the accompanying target notes in Appendix E.

Target notes were taken which are used to highlight specific features too small to map or are of particular interest. Features and habitats with potential for protected species were identified within these notes. The notes are numbered and plotted on the map (see Appendix E) and photographs were often taken to illustrate the note.

A walkover and drive-by survey of the area was undertaken to identify the presence of any ecologically valuable habitats with the potential to support protected and notable species.

3.3 Survey Constraints and Uncertainties

Field surveyors were restricted to locations where public access was available. Habitats were surveyed from Public Right of Ways (PRoW) and roads and therefore some areas were viewed from a distance.

Where this has occurred, aerial photography has been used to supplement the Phase 1 Habitat Survey. Additionally, due to the scale of mapping, habitats less than 4m^2 in area have not been mapped, but target noted were appropriate. This includes buildings, which have not been colour coded from the Phase 1 Habitat handbook due to their scale and abundance. Furthermore, there are a large number of private residential properties within the study area, which were not accessed due to the sensitive nature of the Scheme.

Due to the seasonality of the survey (March-April when vegetation is yet to be fully established), the rapid nature of the assessment and as field surveyors were confined to publically accessible areas, it was not always possible to record species lists and undertake a detailed assessment of habitat types.

Due to the contentious nature of this Scheme the four proposed route Options will not be made public knowledge prior to the consultation period (end of 2016) therefore no landowner access was sought which meant surveys were solely conducted from PRoWs and drive by inspections. Due to the reasons stated, it was not possible to access approximately 35% of the Scheme to assess habitats and potential for protected species (illustrated on the Phase 1 Habitat map, Appendix D). However, once landowner access has been granted these areas will be surveyed and the report and Phase 1 maps updated accordingly.

The survey cannot, therefore, be considered to provide a wholly comprehensive account of the ecological interest of the site and it should be noted that this report does not constitute an Ecological Impact Assessment. The survey does, however, provide a “snapshot” of the ecological interest present on the day of the survey visit.

4 Ecological Features

4.1 Designated Sites

A number of nationally and locally designated sites occur within 2km of the proposed Scheme and four SACs designated for bats are located within 30km. No internationally designated sites were identified within 2km. The location of the designated sites can be found in Appendix A and citations detailing the characteristics of these features can found in Appendix E of this report.

4.1.1 Statutory Designated Sites

Statutory designated sites, within 2km of the proposed options are listed within Table 3.1 and SACs designated for bats are listed within Table 4.1.

Table 4.1: Statutory designated sites within 2km of the proposed Scheme.

Designation Site Name	Designation	Level of Importance	Distance from Option 1 (m)	Distance from Option 13, 2/2D, 8A/8B (m)
Bickenhall Orchard	Local Nature Reserve (LNR)	Local designation	700	700
South Taunton Streams	LNR	Local designation	>2km	700-1000
Children's Wood/Riverside Park	LNR	Local designation	>2km	1000
Barrington Hill	National Nature Reserve (NNR)	Local designation	>2km	1500
Barrington Hill Meadows	Special Site of Scientific Interest (SSSI)	National Designation	>2km	1500
Thurlbear Wood and Quarrylands	SSSI	National Designation	100	1800
Blackdown Hills	Areas of Outstanding Natural Beauty(England)	National Designation	200	2000

Bickenhall Orchard LNR

Bickenhall Orchard is a small traditional orchard with a variety of standard fruit trees of uncommon varieties of apple and pear. The grassland within the orchard is species-rich, dominated by grasses such as Timothy *Phleum pratense*, crested dogstail *Cynosurus cristatus* and sweet vernal *grass Anthoxanthum odoratum* but with a wide range of herbs. Deciduous hedgerows surround most of the site. Species observed include the butterflies meadow brown *Maniola jurtina*, ringlet *Aphantopus hyperantus* and marbled white *Melanargia galathea*, as well as slow worms *Anguis fragilis* and field signs of badgers *Meles meles*.

South Taunton Streams LNR

South Taunton Streams LNR is a series of wetland habitats including Black Brook, which is 200m north of Option 13, Galmington Stream and Mill Stream. The watercourses flow northwards to the River Tone and

are associated with a number of ponds, tributaries, species-rich grassland and woodland. The watercourses and wetland habitats support a very diverse flora and fauna with significant colonies of water vole *Arvicola amphibius* in several locations.

Otters *Lutra lutra* are also recorded along the brooks and streams and common kingfisher *Alcedo atthis*, grey wagtail *Motacilla cinerea*, sand martin *Riparia riparia* and dipper *Cinclus cinclus* regularly occur. White-clawed crayfish *Austropotamobius pallipes* were formerly present and great crested newts *Triturus cristatus* have been recorded in the vicinity and may be present in some of the ponds.

Children's Wood/Riverside Park LNR

Children's Wood was formed during the River Tone flood alleviation work. It is formed of large woodland blocks and standard trees, including a small orchard at Obridge. It is adjoined by Hankridge Riverside. This reserve is an important habitat for wildlife such as otter and bats including common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, lesser horseshoe *Rhinolophus hipposideros* and daubenton's bat *Myotis daubentonii*.

Barrington Hill NNR and SSSI

Barrington Hill NNR and SSSI comprises 4 meadows of unimproved, species-rich neutral grassland. In spring, green-winged orchid *Anacamptis morio* are particularly plentiful throughout the meadows. Other orchids regularly recorded include the early purple *Orchis mascula*, common twayblade *Neottia ovata* and common spotted *Dactylorhiza fuchsii* varieties. The hedgerows are also home to a wide range of birds, small mammals and insects. Local butterflies include common blue *Polyommatus icarus*, meadow brown, speckled wood *Pararge aegeria*, brimstone *Gonepteryx rhamni* and orange tip *Anthocharis cardamines*.

Thurlbear Wood and Quarrylands SSSI

This is a lowland broadleaved, mixed and yew woodland. Thurlbear Wood is a species-rich woodland, formerly managed in a traditional coppice-with-standards system and situated on soils derived from Rhaetic shales and limestones. The Quarrylands are an area of calcareous grassland, and scrub occupying 19th century workings in Lias Limestone.

Blackdown Hills AONB

The Blackdown Hills are a distinctive, diverse rural landscape stretching from the M5 in the north to Honiton and Axminster in the south, and from Chard in the east to Culmstock in the west. The Blackdown Hills AONB was designated in 1991 under the National Parks and Access to the Countryside Act 1949. The AONB forms a significant part of the Blackdowns Natural Area. The key habitats within the AONB are: calcareous grassland; unimproved neutral-acid grassland; lowland heath; mires and bogs; ash, oak and wet woodland; species-rich hedgerows; and rivers and streams.

Table 4.2: Special Areas of Conservation (SAC) designated for bats within 30km of the four Options.

Site Name	Bat species site is designated for	Level of importance	Approximate distance from Option 1 (km)	Approximate distance from Option 13, 2/2D, 8A/8B (km)
Hestercombe House SAC	Lesser horseshoe bat	International	6km	4.3km
Brackets Coppice SAC	Bechsteins Bat *Myotis bechsteini*	International	18km	18km
Exmoor and Quantock Oakwoods SAC	Barbestrelle *Barbastella barbastellus*	International	18km	16km
Beer Quarry SAC	Bechsteins Bat	International	30km	29km

4.1.2 Non Statutory Designated Sites

A large number of non-statutory designated sites are located within 2km of all Options. This includes 97 LWS, and over 15 areas of ancient woodland. This includes, but is not limited to Thurbear Wood and Ashill Wood designated ancient woodlands which Option 1 borders and Stoke wood and Bickenhall Wood, designated ancient woodland, which Options 2/2D, 8A/8B and 13 border.

4.2 Habitats

The main habitat types found within the ZoI for each option are presented in this section. The Phase 1 Habitat map for Option 1 is provided in Appendix D.1 and for Options 2/2D, 8A/8B and 13 within Appendix D.2. A description of specific habitat types, dominant plant species and notes on presence of protected species are provided in the Phase 1 Habitat Survey target notes in Appendix E.1 and E.2 respectively. Target notes are referred to as TN1, TN2 etc. in the following section. Due to the large scale of this Scheme and for the purpose of this report the habitat section has been split into Option 1 western, central and eastern sections and Options 2/2D, 8A/8B and 13 western, central and eastern sections.

4.3 Option 1

Option 1 stretches offline of the A358, from the M5 at Taunton between Shoreditch Road and Poundisford and passes through Orchard Portman and Hatch Beauchamp to re-join the A303 north of Ilminster.

4.3.1 Western Section - Poundisford to Orchard Portman

The western section of Option 1 runs from Poundisford to Orchard Portman (Phase 1 Habitat Drawings Sheets 1 -3). This section, excluding the associated hardstanding of the M5, is predominately rural with arable fields, species-poor semi-improved grassland fields and scattered broadleaved woodland intercepted by intact and defunct hedgerows and watercourses. Villages, including Kibbear, Poundisford, Duddlestone, Orchard Portman and Frost Street, predominately comprised of hardstanding, buildings and amenity grassland.

Arable

Option 1 intersects numerous arable fields within the western section of the Scheme with the majority of fields observed to be sewn with winter wheat *Triticum* sp. However, some daffodil *Narcissus* sp. fields, located near Taunton Racecourse (TN5) and north of the M5 (TN13) were also identified.

Species-Poor Semi-Improved Grassland

This habitat type is scattered across the western section of Option 1 with the majority of fields being grazed by livestock including sheep, horses and cows. Common species identified include dominant cock's-foot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus* and fescues *Festuca spp.,* with white clover *Trifolium repens,* dandelion *Taraxacum officinale agg.*, perennial rye-grass *Lolium perenne* and creeping buttercup *Ranunculus repens* in areas.

Amenity Grassland

Amenity grassland is located within the majority of residential properties of the western section with the vegetation observed to be species-poor and short through regular cutting. It is comprised of dominant perennial rye-grass with rare dandelion and common daisy *Bellis perennis*.

Marshy grassland

A field of marshy grassland located at Haygrass Farm, south of the M5 (TN16) has patches of soft rush *Juncus effusus* and hard rush *Juncus inflexus*.

Improved grassland

Numerous improved fields are located within this section of the Scheme with the majority being located near Frost Street used for set aside as well as a polo ground field near Orchard Portman (TN21) and a solar farm near Taunton Racecourse (TN6). These grasslands were observed to have a lush even sward and were dominated by perennial rye grass *Lolium perenne* and white clover.

Hedgerows

There are numerous hedgerows that occur within the western section including intact hedgerows, defunct hedgerows, hedgerow banks and hedgerows with trees. Many of these hedgerows were observed to be managed by hedge laying, creating thick, species diverse corridors with some having streams and wet ditch features.

This includes several hedgerows near Bickenhall which have a diverse range of native woody species including dominant blackthorn *Prunus spinosa*, hawthorn *Crataegus monogyna* and bramble *Rubus* agg. with occasional pedunculate oak *Quercus robur*, ash *Fraxinus excelsior*, wild privet *Ligustrum vulgare*, horse chestnut *Aesculus hippocastanum* and hazel *Corylus avellana* (TN30, TN37 and TN38).

Broadleaved Semi-Natural Woodland

There are four blocks of broadleaved semi-natural woodland within this section. These are as follows:

- Orchard wood is located approximately 400m south of Option 1. It is an ancient replanted woodland and is well connected to Lime Ridge Wood as well as the wider landscape by a network of hedgerows. Approximately 8ha of the woodland falls within the ZoI comprising frequent coppiced hazel, ash and oak with occasional beech *Fagus sylvatica* holly *Ilex aquifolium* and bramble. The ground flora species comprises dominant bluebells *Hyacinthoides non-scripta* and lords and lady's *Arum maculatum* with occasional dog's mercury *Mercurialis perennis* and ground ivy *Glechoma hederacea* (TN25);
- Thurlbear Wood, an ancient woodland, was not surveyed due to access. However, Option 1 runs near to its southern border. This woodland is well connected to the surrounding landscape, with it being connected to Great Boles wood, a nature reserve and many hedgerows;
- Grove Coppice is approximately 4.3ha in size and is located 500m west of Option 1. This woodland was not surveyed due to access, but is connected to the wider landscape by hedgerows; and,
- Didworthy Coppice is approximately 3hais size and lies adjacent to Stowford Plantation. It was not surveyed due to access and is approximately 225m west of Option 1. .

Broadleaved semi-natural woodland also borders multiple streams within this section (TN10, TN20a), creating important riparian habitat corridors. For instance, stream 2 (TN 3), which is intersected by Option 1 is bordered by dominant ash and oak with occasional field maple *Acer campestre*, coppiced hazel, holly and bramble. Ground flora species included dominant bluebells, wild garlic *Allium ursinum* and lords-and-ladies with occasional ground ivy and rare soft tree fern *Dicksonia Antarctica* and hart's-tongue fern *Asplenium scolopendrium,*

Finally, broadleaved woodland also borders both sides of the M5 as part of its landscaping. Species identified include blackthorn, ash, bramble, beech and oak.

Plantation Woodland

Plantation woodland scatters the western section including mixed woodland, broadleaved woodland and coniferous woodland. For example a small young mixed plantation woodland strip is located close to the M5 at Poundisford (TN14) with species including spruce *Picea* sp., scots pine *Pinus sylvestris*, Leylandii *Leyland cypress*, beech and sycamore *Acer pseudoplatanus*. Apple orchards are also located in this area, as well as within the village of Duddlestone. (TN7, TN9).

The Forestry Commission (FC) manages three coniferous plantation woodlands in this section which are all intersected by Option 1. They are Great Boles, approximately 18ha (TN31), Strums Hill Plantation, approximately 7ha (TN33) and Grughay Close, approximately 2.5ha. Great Boles, is a large plantation of scots pine which is well connected to Thurlbear Wood and is bordered by a species-rich, broadleaved woodland bank including coppiced hazel. Strums Hill Plantation and Grughay Close are connected and are very similar to Great Boles, being bordered by a broadleaved woodland strip, however, larch *Larix* sp. was also identified within their canopy.

Scattered Trees

Scattered trees are located within this section (TN11, TN15, TN18a, TN21, TN22, TN24 and TN29) ranging in age and condition. Species identified include oak, horse chestnut and sycamore.

Due to the size and maturity of the some of the trees they may be subject to a Tree Preservation Order (TPO).

Scrub

Scattered scrub is located throughout this section. The M5 is bordered by scattered scrub along its verge as well as an earth mound left from its construction near Haygrass House, which forms an important ecological feature (TN1). Species identified here include bramble, dog rose *Rosa Canina*, and Buddleia *Buddleja davidii.* Additionally, Option 1 will intercept a brownfield site, north of Fosgrove Farm (TN17) which has scattered scrub as well as Stream 17, which is bordered by scattered scrub.

Tall Ruderal

Some small areas of unmanaged tall ruderal vegetation were identified within this section. This includes the earth mound left from the M5 construction near Haygrass House (TN1) and a brownfield site north of Fosgrove Farm (TN17). Species identified at both these locations include dock species *Rumex spp.* and common nettle *Urtica dioica*.

Running Water

A network of nine streams and multiple wet ditches are located within this section. The streams and ditches that were surveyed are discussed below. However, Watercourses 3, 10, 11, 14 and 17 were not surveyed due to access.

All watercourses surveyed were found to be important riparian habitat corridors. Watercourse 2 (TN3), which is intersected by Option 1, runs north of Haygrass House, near the M5. The streams substrate is predominately silt with its flow being slow to ripple in areas. Sherford Stream, (WC1 and TN10) runs from Pitminster to Sherford, crossing the western part of the Scheme. The stream has steep sided wooded banks, with submerged roots and exposed earth. Its flow is generally smooth, side bars and debris dams are present. A wet ditch was observed north of Duddlestone (TN18b). Species identified along its edge include fools water cress *Apium nodiflorum* and water dropwort *Oenanthe aquatic* .Moving east, Broughton Brook (WC4, TN20a and TN26) crosses through Option 1. It is a fast flowing stream with a silt and pebble substrate, running over a weir in Orchard Portman. The stream has a variety of features including small waterfalls, debris dams and side bars. Finally, Watercourse 9 (TN28) runs through the centre of the study area from Netherclay and is also intersected by Option 1. The flow was observed to be smooth with some ripples and the water depth was shallow with pools in areas. Side bars, small waterfalls, debris dams and weirs were regular features identified along its course.

Standing Water

Thirty three ponds were identified within the western section of Option 1 from OS mapping, from this only four were observed during the survey due to access (TN4, TN8, TN18b and TN32).

Structures

A network of roads and associated infrastructure are located within this section, this includes the M5 and smaller country lanes. Multiple buildings scatter the section including agricultural (TN18) and residential dwellings as well as forming the villages of Kibbear, Poundisford, Duddlestone, Orchard Portman and Frost Street.

4.3.2 Central Section – Bickenhall to Beercrocombe

The central section for Option 1 runs from Bickenhall through Hatch Beauchamp to Beercrocombe (Phase 1 Habitat Drawings Sheets 4 and 5). This section is rural in nature, comprising improved and arable fields with some semi-improved grassland intercepted by intact hedgerows, hedgerows with trees, wet ditches and watercourses. Small areas of woodland and some orchards are also present with scattered settlements including the villages of Hatch Green, Capland and Bickenhall with associated amenity grassland and introduced shrubbery.

Improved Grassland

Option 1 passes through numerous improved fields which are located within Hatch Beauchamp CP, near Fivehead River (WC18) and Beercrocombe. The majority of the fields surveyed were set aside, with no grazing observed. Dominant species identified included perennial rye grass and white clover with occasional cock's-foot and rare stands of dock.

Arable Fields

Arable fields are scattered throughout this section with the majority sewn with winter wheat crops. Some field margins are present being 5m wide in areas and predominately improved grassland. A nursery is also located north of Capland.

Species-Poor Semi-Improved Grassland

Occasional poor semi-improved grassland was identified near Capland, Bickenhall Plain and Whittles Farm. The majority of these fields were grazed, primarily by sheep and horses with poaching in areas. Species identified include dominant cock's-foot, Yorkshire fog and fescues, with occasional white clover, dandelion and infrequent teasel *Dipsacus fullonum.*

Amenity Grassland

This habitat is present within residential properties and within grass verges of the A358 and smaller minor roads. It is close mown and intensively managed with perennial rye-grass being the dominant species.

Marshy grassland

One field of marshy grassland was identified and is located south of the A358 and Capland.

Tall Ruderal

Tall ruderal vegetation forms small areas at both Lower Mill and Fordbridge where it is the dominant habitat amongst scrub and scattered trees. Species identified at both sites included dock species and common nettle.

Smaller areas of tall ruderal vegetation were identified as a part of a mosaic of other habitats. This includes a grave yard at Neroche Hall (TN34), the understory of a plantation woodland north of Capland Farm (TN45), near a disused railway bridge (TN52) and along Frog Street green lane (TN58).

Scrub

Small areas of scattered scrub are dotted over the central section. The majority being identified along Stream 17 and Fivehead River (WC18) with blackthorn and bramble identified. Additionally, it was identified near the dismantled railway (TN52 and TN57).

Introduced Shrub

Introduced shrub in the form of ornamental planting scatters many gardens. This includes a large area near Frogstreet Farm, where many species were planted along a wide verge. Species noted include box *Buxus* sp. and laurel *Laurus* sp.

Hedgerows

There are a variety of hedgerows within the central section including intact hedgerows, defunct hedgerows, hedgerow banks and hedgerows with trees. Many of these hedgerows had evidence of being manged by hedge laying, whilst others had recently been flailed.

Some hedgerows were noted as important ecological features including a hedgerow with mature trees which was identified east of the Old Dairy, Bickenhall with species including oak, blackthorn, wild privet and bramble identified (TN37). East of this hedgerow, a green lane is located adjacent to the A358 at Hatch Green (TN38). This green lane is formed by two hedgerows with trees including frequent ash, sycamore, oak with occasional hazel. Green lanes are seen as important ecological features because they provide shelter, foraging and commuting opportunities for a variety of species. Further east, a species-rich hedgerow bordering an arable field was observed south of Hatch Beauchamp (TN47). This hedgerow is

lined with mature oak trees with woody species including dominant blackthorn and hawthorn, with frequent bramble and rare holly and wild privet. Additionally, a species-rich hedgerow was identified at Beercrocombe on Stocks Lane. Species include abundant hazel, blackthorn, hawthorn with occasional oak, elder *Sambucus nigra*, bramble and ivy. Finally, Frog Street green lane is located south of Beercrocombe. It is formed by two ancient banked hedgerows with trees and was flooded at the time of survey (TN58).

Broadleaved Semi-Natural Woodland

Linier belts of broadleaved woodland were identified across this section forming field boundaries (TN54 and TN64), bordering watercourses (TN41, TN51, TN58 and TN59) and small clusters on the edges of fields. Additionally, a larger strip of woodland borders a disused railway track at Beercrocombe (TN 52 and TN57). Species identified in this strip include ash, sycamore, oak and hazel. This strip of woodland is well connected to the wider landscape, many hedgerows join onto it, creating important wildlife corridors.

Mixed Woodland

Three small isolated pockets of mixed woodland occur within this section. These include Bens Copse, approximately 300m north of Option 1 measuring approximately 6.2ha (2.5ha within study area), Saltfield Copse, approximately 350m north of Option 1, measuring 1.6ha approximately (1.4 ha within study area)and a small area north of Bickenhall Plain. Due to access, these woodlands were observed from a distance with scots pine, leylandii, oak, larch and sycamore identified.

Plantation Woodland

A recently planted broadleaved woodland was identified north of Capland Farm (TN45) with beech, hawthorn, ash, oak and sycamore saplings observed. Just east of this is a coniferous plantation, with a crop of Christmas trees as part of a local nursery (TN44). Finally, two apple orchards are located near Bickenhall Farm and west of Stocks Lane.

Scattered Trees

An abundance of scattered trees are located within the central section. (TN35, TN40, TN46-47, TN48, TN49 and TN53) ranging in age and condition. Species noted include oak, horse chestnut, ash and sycamore.

Due to the size and maturity of the some of the trees they may be subject to a Tree Preservation Order (TPO).

Running Water

A network of wet ditches, drains and five watercourses are located within this section. The main watercourse is Fivehead River (WC18), which is intercepted by option 1. This river runs through the central section of the study area from Bickenhall past Hatch Beauchamp. It was observed at multiple points

along its course and was noted as an important riparian habitat corridor. The river has been managed at Brandy Bridge (TN36) by reinforced brick sides and a weir. Its flow was observed to be smooth with debris dams, pools, and side bars present along its length (TN41 and TN59). Additionally, the rivers channel was observed to have changed, with a dry ditch present where it once flowed south of Hatch Beauchamp (TN51). Finally, a wet ditch was observed (TN58) running into the river at Frog Street green lane, which at the time of survey had flooded.

Watercourses 17, 20 and 21 were not surveyed due to access at this section.

Standing Water

There are approximately twenty eight ponds located within the central section of Option 1, identified from OS mapping. Out of the twenty eight identified, only three were observed during the survey due to access (TN34, TN50 and TN61).

Structures

Multiple structures are located within the central section of Option 1. This includes domestic houses within the settlements of Bickenhall, Capland and Fordbridge as well as agricultural buildings which are linked by small country lanes. The A358 also passes through this section between Beercrocombe and Bickenhall. Finally a disused railway line runs through this section with associated over and underbridges.

4.3.3 Eastern Section - North of Ashill to South of Ilton.

The eastern section of Option 1 runs from north of Ashill to South of Ilton, where it re-joins the A358 (Phase 1 Habitat Drawings sheets 6 and 7. This section has a variety of habitats, with arable, improved and semi Improved grassland being the dominating habitats. Merryfield Airfield is located to the north of this section and a disused railway line runs through its centre. The settlements off Rapps and Cad Green fall within this section as well as multiple farms connected by small lanes and the A358.

Arable

An abundance of arable fields are located within the eastern section with the majority located north east of Ashill. Some have been recently ploughed or sewn with crops such as winter wheat. Field margins were noted in areas including a wide semi-improved grassland margin, located west of Ashill Wood (TN68).

Improved Grassland

This option intersects many improved grassland fields. North of Ashill, the improved grassland was set aside, with perennial rye-grass being the dominant species. However, south of Ilton many fields were used as grazing pasture with vegetation comprising dominant perennial rye-grass with rare Yorkshire fog, cock's-foot and white clover.

Species-Poor Semi-Improved Grassland

Small pockets of species-poor semi-improved grassland were identified north of Ashill. These fields were grazed, however they were observed to have a diverse range of forb species, with species including dominant cock's-foot, Yorkshire fog and fescues, with occasional white clover, dandelion and dock with rare teasel.

Marshy Grassland

Four areas of marshy grassland where are located north of Winterhay Green. These areas were observed to have occasional patches of soft rush, hard rush and occasional great willowherb *Epilobium hirsutum*.

Amenity Grassland

Amenity grassland is located within residential properties and verges. In most areas is was observed to be short (through regular cutting), closed and species-poor comprising of dominant perennial rye-grass with rare dandelion and common daisy.

Tall Ruderal Vegetation

Tall ruderal vegetation was identified as the dominant habitat within three isolated fields north and south of the A303. At all sites, this habitat was unmanaged comprising dominant common nettle, dock species and occasional rosebay willowherb *Chamerion angustifolium*. A smaller pocket of tall ruderal vegetation was also identified scattering the bank of River Isle (TN 92).

Mixed Semi-Natural Woodland

Two pockets of mixed semi-natural woodland are located within the eastern section of Option 1. They form Everys Copse (TN71a) approximately 6ha in size and a small part (approximately 3ha) of Ashill Wood (TN70). Both areas form part of LWSs, designated as ancient replanted woodland, with a small area to the south of Everys Copse designated as ancient and semi-natural woodland. Species identified include dominant oak, sycamore, and scots pine with frequent holly, leylandii and field maple, with an understory of abundant wild garlic, bluebells and bramble. As these woodlands are privately managed, it was not possible to compile a comprehensive species list.

Broadleaved Woodland

Broadleaved woodland scatters the eastern part of the study site in small pockets (TN84) and forms field boundaries (TN81, TN97), riparian habitat (TN66) and along a disused railway line (TN57). It also forms part of Ashill Wood, covering approximately 12 ha (TN70). This woodland is designated as a LWS due to its ancient and semi-natural woodland and ancient replanted woodland. It is well connected to the wider landscape by hedgerows and is in close proximity to Scutty Benches Copse and Everys Copse. As this wood is private a full species list is unavailable, however species identified include oak, ash, sycamore and hazel with occasional holly.

Scattered Trees

A range of broadleaved trees ranging in age and condition are located within this section. They were observed bordering Watercourse 25 (TN77) and 26 as well as within hedgerows (TN76, TN78, TN80, TN94 and TN95) and scattered within fields (TN86, TN87 and TN91). Species identified include oak and sycamore.

Due to the size and maturity of the some of the trees they may be subject to a Tree Preservation Order (TPO).

Hedgerows

A network of hedgerows are located as boundary features throughout the surveyed areas, this includes intact hedgerows, species-poor hedgerows, hedgerows with trees and in some cases native species-rich hedgerows.

A species-rich hedgerow was identified at Hortmead Lane, just 10 m from Option 1, consisting of frequent hawthorn, oak, lime *Tilia* sp., field maple and blackthorn (TN72). It was also noted that Mill Lane, north-west of Ashwell, is bordered by two species-rich hedgerows consisting of dominant elder and frequent alder *Alnus glutinosa*, hawthorn, blackthorn and hazel. Ground flora identified includes dominant nettle, frequent creeping buttercup with occasional lords-and-ladies, lesser celandine *Ficaria verna* and rare hart's-tongue and cleavers *Galium aparine* (TN90). Finally, the majority of species-poor hedgerows observed were recently flailed comprising of dominant hawthorn, occasional blackthorn and rare hazel.

Running Water

A network of wet ditches, drains and seven watercourses are located within this section. Due to access, six watercourses and one wet ditch were surveyed.

Venners Water (WC21 and TN66) is intersected by Option 1, north of Ashill. It was noted as an important riparian habitat corridor with scattered mature trees and broadleaved woodland bordering its edges. The stream's flow was observed to be smooth and its banks were steep with exposed earth and roots in areas. South of Ashill Wood, a wet ditch was observed running along the southern boundary at Park Barn lane (TN69).

Back Stream (WC23 and TN74) runs south of Cad Green and is intersected by Option 1 at Cad Farm. This stream was observed at Cad Bridge and was noted as being fast flowing and clear. Cad Brook (WC25, TN73 and TN75), is also intersected by Option 1. It is a medium flowing stream with gravel substrate and vertical earth banks in areas. Moving east, Watercourse 26 (TN88) runs near Ashwell sewage works, it was noted to be very slow flowing and turbid in areas.

Finally, the River Isle (WC27, TN96, TN92 and TN85) and Back Stream (WC28 and TN82) were both observed near the overpass of the B3168 over the A303. Back stream was noted to be fast flowing with

clear water, whilst the River Isle had a variety of features including side bars, reinforced banks and an effluent outflow.

Standing Water

There are thirty six ponds within the eastern section of Option 1. However due to access, none of these ponds were directly observed.

Structures

A variety of structures are located within the eastern section of Option 1. This includes scattered farms, a sewage treatment works, Merryfield Airfield and the settlements of Rapps and Cad Green, which are joined by a network of roads including the A303 and B3168. Additionally, the Schemes eastern section follows the line of a disused railway to Cad Farm. This disused railway has structures including over and under bridges within this section.

4.4 Options 13, 2/2D and 8A/8B

4.4.1 Western Section Taunton to West Hatch

The western section for Options 2/2D, 8A/8B and 13 starts to the east of the M5 at Taunton and runs through Hayden and Henlade (Phase 1 Habitat Drawings Sheets 1-4). This section is rural in nature, dominated by arable fields with pockets of improved and semi-improved grassland. A network of intact hedgerows and hedgerows with trees cross this section as well as numerous drains, wet ditches and watercourses.

Improved Grassland

Improved grassland occurred in pockets across the western section of the Scheme. A small pocket of 4 fields are located to the west in close proximity to Junction 25 of the M5 motorway, one pocket located within Thornfalcon comprising approximately nine fields. The reaming areas of improved grassland occurred in isolation in Rushington and towards Meare Green. The dominant species of this type of grassland is perennial rye grass.

Poor Semi-Improved Grassland

A substantial amount of poor semi-improved grassland appears spread across the western section and will be within the works footprint for these options. A number of these fields were heavily grazed by sheep. Common species include red clover, fescues perennial rye grass, dandelion, yarrow *Achillea millefolium* and teasel.

Semi-improved Acid Grassland

One area of semi-improved acid grassland was noted at Thornhill which was rabbit grazed with anthills. Gorse stands are present but some have recently been cleared and left in situ. Ground flora comprises of frequent lesser celandine *Ranunculus ficaria* clovers sp, ribwort plantain *Plantago lanceolata* occasional creeping thistle *Cirsium arvense* red dead nettle *Lamium purpureum* lords and ladies and doc sp.

Marsh/Marshy Grassland

A small area of marshy grassland is located is located between the A358 and Haydon lane which will be directly impacted by all the options. The marsh grassland comprises patches of soft rush *Juncus effusus* and hard rush *Juncus inflexus*.

Arable Fields

This is the dominant habitat and appears across western extent of the Scheme. A variety of arable fields are located within this section with some being ploughed with the majority sewn with crop including winter wheat.

Amenity Grassland

These are areas of close mown, intensively managed grassland which are present within residential properties and road side vergers across the western extent of the Scheme and are considered to be of little ecological value.

Broadleaved Semi-Natural Woodland

There are eight blocks of woodland habitat which been identified from the within the western end of the Scheme. These are as follows:

- Stoke wood is a substantial block of ancient semi – natural broadleaved woodland measuring approximately 18.3 ha and is located north-east of the village of Stoke St Mary. These route options are located immediately north of this woodland. It was only possible to view this woodland from the road as it is a private woodland with no access, therefore the structure of the woodland cannot be described and no species list comprised. Immediately adjacent to the Stoke Wood is Kennel Covert which measures approximately 3.6 ha, as with Stoke Wood this woodland could not be viewed in detail. These woodlands are connected to a network of intact hedgerows surrounded by mainly arable fields.
- Knowl wood is an ancient semi-natural broadleaved woodland located adjacent to Stoke Road and south west from Stoke wood, this woodland measures approximately 1.7ha the current route options are located approximately 0.12km to the north of the woodland. This woodland is well connected by a network of intact hedgerows and hedgerow with trees to small blocks of woodland in the vicinity.
- Three small blocks of broad leaved semi-natural woodland occur between Knowl wood and Ash, 2 un-named blocks measuring 1.50 and 0.88 ha, these woodlands are mainly surrounded by arable fields

and semi-improved grassland, they are well connected by a network of hedgerows which link to Knowl wood. The options run in between these two woodlands, clipping the one closest to the A358.

- Huish Cope measuring 1.21 ha is an isolated block of woodland connected by hedgerows to Huish Copse East. Options 2/2D and 8A/8B are immediately north of this woodland and option 13 is located immediately to the south.
- Huish Copse East is an ancient semi-natural block of woodland measuring approximately 1.27 ha is ancient broadleaved semi-natural woodland with broadleaved plantation on an ancient woodland site and is located north of West Hatch which is connected by a network of intact hedgerows and links up to smaller blocks of woodland in the vicinity. Route options 2/2D and 8A/8B clip the northern edge of this woodland. Immediately to the south and joining onto this woodland is Huish Copse and measures approximately 7.83 ha. These two blocks of woodland comprise frequent ash and oak with an understory of coppiced hazel, hawthorn and blackthorn. Ground flora comprises frequent dogs mercury, ivy, nettles and occasional lords and ladies. Full access to the woodland was not possible therefore the species list is not exhaustive.

Two small blocks of semi - natural woodland lie to the north of the A358 in Thornfalcon:

- One of which comprises dominant oak with an understorey of frequent hazel coppice, bramble with occasional elder. Ground flora comprises abundant dog's mercury, nettles with frequent lords and ladies and common ivy *Hedera helix* (TN48).
- The other small block of woodland was viewed from a far so no species list compiled. A linier belt of broadleaved woodland also borders both sides of the M5 as part of its landscaping and in areas along the A358 and Hayden Lane (TN18 and 25). Species identified include blackthorn, ash, bramble, beech and oak. These two blocks of woodland are connected to each other by intact hedgerows and are surrounded by mainly arable fields.

Plantation Woodland

A plantation woodland is located immediately adjacent to Knowl Wood (TN41) which comprises a planted coppiced hazel woodland fringe and an area of semi mature planted woodland. All three route options are located immediately north of this woodland.

Mixed Woodland

One small circular block of isolated area of mixed woodland measuring 0.51 ha is located in Thornfalcon on Thorn Hill, comprising Scott's pine, ash and oak with an understorey of blackthorn and bramble.

Scattered Trees

There is a large number of scattered trees across the western section which range in age and condition. Species identified include oak, horse chestnut and sycamore. Parkland has been identified in two areas one located on the corner of Stoke Road and Greenway Road and the other located in Rushington in the ground of a hotel.

Due to the size and maturity of the some of the trees they may be subject to a Tree Preservation Order (TPO).

Scrub

Scattered and areas of dense continuous scrub is located throughout the western section.

The M5 is bordered by scattered and areas of dense continuous scrub along its verge (TN28) and the A358 also has areas of scattered scrub along its corridor, Stoke Road also has scrub along the road side verge scrub in these locations comprises hawthorn, blackthorn, bramble and dog rose (TN33a).

Broughton Brook has numerous areas scattered and dense continuous scrub, notably in the section adjacent to the M5 below junction 25 (TN10). Watercourses though out this section have scattered of continuous scrub dotted along their banks (TN6, TN10 and TN13).

There are four areas observed which form a mosaic of scrub, grassland and tall ruderals. Scrub in these locations consists mainly of bramble and occasional Buddleia (TN2, 4, 19 and 40).

As access was limited to public rights it can be assumed that not all areas of scrub will have been observed.

Introduced Shrub

Introduced shrub in the form of ornamental planting is abundant across the gardens of residential properties.

Tall Ruderal

Tall ruderal vegetation is present along the M5 verge and A358 corridor. It has also been observed in two isolated locations within arable fields (TN 51, 60 and 61). In addition tall ruderal vegetation was identified as part of a mosaic of other habitats in three locations in close proximity to the M5 Junction 25 and one isolated occurrence adjacent to Dairy House Farm (TN2, 4, 19 and 40).

Hedgerows

There are a large number of hedgerows that occur as boundary features throughout the surveyed area. These include species-poor intact hedges, important species-rich hedgerows as well as hedgerows with trees.

As the survey was undertaken from PRoW only it was not possible to view each hedgerow in detail within the survey area therefore a comprehensive species list for each hedgerow was not possible. Overall the dominant hedgerow species observed was Elder. A species-rich hedgerow was observed close to Huish Wood and comprises dominate elder with frequent hawthorn, blackthorn occasional hazel and bramble. Ground flora comprises frequent lords and ladies, bluebell and occasional pendulous sedge.

In addition another species-rich hedge was identified in Thornfalcon in close proximity to Thorn Hill which comprises dominant blackthorn and bramble with frequent ash, elder, hazel and occasional holly (TN50).These options will directly impact numerous hedgerows which are an important wildlife corridor.

Standing Water

There are approximately 19 ponds located within the western section identified from OS mapping within 500m of the proposed options. However due to no landowner access no HSI were undertaken.

Running Water

A network of wet ditches, drains and four watercourses are located within the western section of the Scheme.

The main watercourse in this section being Broughton Brook. This watercourse extends across the western extent of the Scheme from below Stoke Lane, up and under Haydon Lane and then runs adjacent to the M5 until it reaches the River Tone located to the north of Junction 25 of the M5. Broughton Brook is fast flowing in places comprises steep sided banks, raised gravel banks in places and silt substrate. The bank side vegetation comprises scattered mature trees, areas of patchy and continuous scrub, tall ruderals. Bank side flora comprises teasel, lords and ladies, rosebay willow herb, nettles, pendulous sedge, wild garlic, hemlock water dropwort. (WC4 and TN 10 and13). The southern section of these options intersects Broughton Brook between Stoke Lane and Haydon Lane.

Stream (WC6) also extends across the western extent of the Scheme from Stoke Road, under Hayden Lane to eventually join Broughton Brook at Junction 25. At the point where the Stream runs under Hayden Lane (TN33c) it is fast flowing with steep sided banks and a gravel/rock sub straight. Bankside vegetation comprises frequent hawthorn and willow. Ground flora comprises frequent rosebay willow herb, wild garlic and occasional pendulous sedge. As the steam extends up, the flow becomes moderate with shallow sided banks (TN11). At the point where the stream steam joins Broughton Brook, the flow is moderately fast flowing with a gravel substrate. It is canalised as it flows towards the M5 at Junction 25.

The northern section of the options run immediately adjacent to this watercourse and also intersects it in two locations.

Another stream (WC8) is located to the south of the A358 and joins up to WC6, it extends down towards Henlade. The bankside vegetation comprise scattered matured trees, areas of broadleaved woodland and scrub. This is a moderately fast flowing stream with a gravel substrate. All options intersect this watercourse to the east of Henlade.

Steam (WC7) is steep sided with a gravel substrate, the bankside vegetation comprises tall ruderals such as rose by willow herb (TN38). It is located north west of Stoke St Mary and extends up towards Hayden and joins WC6. The options do not directly impact upon this watercourse.

Watercourse WC12, WC13 and many drains and ditches were not surveyed due to access.

4.4.2 Central Section – West Hatch to Hatch Beauchamp

The central section of the study area for Options 13, 2/2D and 8A/8B runs from West Hatch through Hatch Beauchamp where all options re-join the A358 to Kenny Bridge, (Phase 1 Habitat Drawings Sheet 4 – 6). This part of the study area is a mixture of improved grassland and species-poor semi-improved grassland with occasional arable fields, broadleaved woodland and mixed woodland with isolated pockets of marshy grassland and species-rich semi-improved grassland. Additionally, the settlements of West Hatch, Hatch Green, Capland and Kenny as well as multiple farms scatter this section and are connected by small lanes and the A358, which runs through the centre of the study area.

Semi-Improved Grassland

Species-poor semi-improved grassland scatters the central part of the study area covering fields north of Capland and Kenny and some scattered filed margins (TN106 and TN107). The majority of fields are grazed by livestock including horses, sheep and chickens. Species identified comprised dominant cock's-foot, Yorkshire fog and fescues, with occasional white clover, dandelion and dock with rare teasel.

Species- rich semi-improved grassland was also observed within 6 fields, north of the A358 and Ashill. Four of these fields were connected whilst two were isolated south of West View Farm between a species-poor semi-improved grassland field, an arable field and the A358. Species identified include dominant false oat grass, meadow fescue, tall fescue and cock's-foot with occasional perennial rye grass, dock, nettle and creeping buttercup and rare herb-robert *Geranium robertianum*, spear thistle *Cirsium vulgare* and doves-foot cranesbill *Geranium molle.*

Improved Grassland

Improved grassland scatters the central section of the study area, with it being most concentrated around West Hatch (TN71, TN72 and TN73). These grasslands were observed to have a lush bright green even sward and were dominated by perennial rye grass and white clover.

Arable

A variety of arable fields are located within this section with some being ploughed with the majority sewn with crop including winter wheat. Many of these fields had margins comprising species-poor semi-improved grassland.

Marshy Grassland

Two fields of marshy grassland are located south of Capland and to the west of Kenny. It also borders a field near Venners Water (TN116). Species identified include soft rush and hard rush.

Amenity Grassland

Amenity grassland forms multiple residential properties and road verges within the central section. Where it was surveyed, it was observed to be species-poor comprising dominant perennial rye-grass with rare dandelion and common daisy.

Broadleaved Woodland

Six clusters of broadleaved woodland are located within the central study area, due to access, only two woodlands were surveyed. They are:

- Abbey Wood (TN80), is approximately 2.3ha in size with species identified, including frequent coppiced hazel, beech, ash and oak with occasional holly. This woodland is connected to Little Oakley Plantation and is where Option 2/2D intercepts this woodland.
- Captain Ravens Wood (TN76), is approximately 12ha in size and is connected to the wider landscape by hedgerows. Its western edge is intercepted by Option 8A/8B. Species identified included frequent coppiced hazel, beech, ash and oak with occasional holly.

The four areas of woodland which were not surveyed are as follows:

- Butles Plantation is approximately 3ha in size and is located approximately 500m east of Options 2/2D, 8A/8B and 13. It is connected to the surrounding landscape by hedgerows;
- Wrights Copse, is approximately 1ha in size and is located within the centre of three fields approximately 300m west of Option 13. This small woodland is connected to the surrounding landscape by hedgerows;
- Hurfords Plantation is intercepted by Option 8A/8B. This woodland is approximately 2.4ha in size and is connected by some hedgerows, however the A358 runs along its eastern border; and,
- Little Oakley Plantation, approximately 1ha in size is located approximately 100m east of Option 8A/8B. This woodland is located at the bottom of an arable field, and is connected by a small linear strip off woodland leading to the A358. Broadleaved woodland also scatters this area (TN102) forming boundaries (TN75) and riparian habitat within this section (TN90, TN93 and TN94). For instance watercourse 18, which flows from Bickenhall through to Hatch Green is bordered in areas by hazel and oak with rare willow and sycamore with an understorey of abundant wild garlic, lords and ladies, nettle and occasional bramble.

Mixed Woodland

Three areas of mixed woodland were identified within the central section of the study area. They are:

- Bickenhall Wood, a designated ancient woodland is approximately 22.3ha in size (TN81) and is located approximately 100m south of Option 13. Species identified included frequent scots pine, oak and silver birch with occasional leylandii, English yew *Taxus baccata* and ash. An understory of bramble, lords and ladies and bluebells with occasional cleavers and nettle was also observed.
- Saltfield Copse is approximately 1.7ha in size and is located adjacent to Options 13, 8A/8B and 2/2D. It is a designated LWS and is connected to the wider landscape by the A358 woodland verge and hedgerows. Due to access, a species list for this woodland is not available.

- Five Acre Copse is approximately 2.5ha in size and is connected to Bickenhall wood. It is located within 100m of Option 2/2D, 8A/8B and 13, with the closest being Option 13, just 30m north of the woodland. Due to access, a species list for this woodland is not available.

Plantation Woodland

Small pockets of plantation woodland are located within the central section of the study area forming orchards (TN100), young broadleaved woodland (TN99) and managed plantations by the FC. This includes Five Acre Copse a plantation of scots pine and designated ancient woodland, which is just 20m south of Option 13.

Scattered Trees

Multiple mature and semi mature trees, ranging in condition scatter this section. This includes, but is not exclusive of hedgerows with mature trees (TN69, TN84 and TN107) and standards within fields and gardens (TN71-73 and TN85). Species identified included frequent oak and occasional sycamore.

Due to the size and maturity of the some of the trees they may be subject to a Tree Preservation Order (TPO).

Hedgerows

A network of hedgerows including defunct hedgerows, intact hedgerows and hedgerows with trees scatter the central section. Due to some hedgerows being viewed from a distance, recent flailing and the time of year (vegetation was not fully established) it was difficult to determine if a hedgerow was species-rich or species-poor. That said, two areas were identified to be important ecological features. Firstly, a green lane, formed by two hedgerows is located just of Bickenhall Lane, which is within the footprint of Option 2/2D, 8A/8B and 13. This green lane had a diverse mosaic of habitats with species identified including frequent coppiced hazel, oak, ash, bramble and blackthorn (TN91). Finally, a species-rich hedgerow with trees on an earth bank was identified north of Venner's Water (TN107). Species included oak standards, frequent blackthorn, hawthorn and bramble with occasional privet, holly and dog rose.

Running Water

A network of drains, ditches and 9 watercourses are located within the central section of the study area. However, due to access, a wet ditch (TN88) and two watercourses were observed. They are Watercourse 18, a local wildlife site, identified as a habitat of high biological quality (TN93-94) and Watercourse 20, which runs from Bickenhall through to Stewley which was observed to be an important riparian habitat corridor (TN89). Both these watercourses flow under the A358 and were observed to have smooth flow with features including, side bars and steep sided banks.

Standing Water

Approximately 34 ponds are located within the central section of the study area, of which, due to access, two were surveyed (TN108 and TN110). Willow *Salix sp* was identified at the edge of both ponds.

Structures

The settlements of West Hatch (where Options 2/2D, 8A/8B and 13 pass within close proximity) Hatch Green (TN96), Capland and Kenny are located within this section as well as scattered farms and outbuildings (TN86 and TN101). These settlements are joined by a network of roads, including the A358 and a disused railway line is located to the north of this section.

Invasive Species

Invasive winter heliotrope *Petasites fragrans* was identified within the study area of Options 2/2D, 8A/8B and 13 on a road verge leading to Ashill (TN121) and on an earth bank near Thickthorn Cross (TN129).

4.4.3 Eastern Section –Ashill to Ilton

The eastern section of the study area for Options 13, 2/2D and 8A/8B runs from Ashill through to South of Ilton, where all Options join the A303 (Phase 1 Habitat Drawings Sheets 7 and 8). This area is predominately arable and improved grassland fields with isolated pockets of broadleaved woodland, marshy grassland, semi-improved grassland and tall ruderal grassland. A network of watercourses, drains and wet ditches scatter the area as well as hedgerows. Finally, the settlements of Kenny, Ashill, Rapps, Horton Cross and Cad Green are located in this section with roads joining them including the A358, A303 and B3168.

Arable

An abundance of arable fields are located within the eastern section of the study area, with the majority located north east of Ashill (TN130). Some have been recently ploughed or sewn with crops such as winter wheat (TN162).

Improved Grassland

A number of improved grassland fields have been identified within the eastern section of the study area. Around Ashill, the improved grassland was set aside, with perennial rye-grass being the dominant species. However, south of Ilton, many fields were used as grazing pasture with vegetation comprising dominant perennial rye-grass with rare Yorkshire fog, cock's-foot and white clover.

Semi-Improved Grassland

A pocket of semi-improved grassland fields are located north of Ashill, within the eastern section of the study area. This includes grazed species-poor semi-improved grassland. These fields were observed to

have a diverse range of forb species as well as dominant cock's-foot, Yorkshire fog and fescues, with occasional white clover, dandelion and dock with infrequent teasel.

Additionally, four connected fields of species-rich semi-improved grassland are also located within this section. Species identified include dominant false oat grass, meadow fescue, tall fescue and cock's-foot with occasional perennial rye grass, dock, nettle and creeping buttercup and rare herb-robert *Geranium robertianum*, spear thistle *Cirsium vulgare* and doves-foot cranesbill *Geranium molle* (TN114).

Marshy Grassland

Marshy grassland was identified covering six scattered fields north of Ilminster (TN151), as well as a small area bordering a field corner near Watercourse 21 (TN116). Species identified in all areas included soft rush, hard rush and occasional greater willowherb.

Tall Ruderal

Three isolated areas of tall ruderal vegetation are located within eastern section of the study area, including an area next to Ashwell sewage treatment works. It was also identified along the bank of the River Isle (TN161). Species identified included nettle, dock and occasional rosebay willowherb.

Amenity Grassland

Amenity grassland forms multiple gardens and verges within the settlements of Kenny, Ashill, Cad Green, and north of Ilminster. It was observed to be species-poor comprising dominant perennial rye-grass with rare dandelion and common daisy.

Scrub

Scrub scatters the eastern part of the study area. This includes an area of dense scrub north of Ilminster formed of bramble and dog rose as well as a small strip of scattered scrub, predominately bramble, forming a boundary between a semi-improved and arable field (TN111). Smaller areas are present forming a mosaic with other habitats, however due to their scale they cannot be mapped.

Broadleaved Woodland

Small isolated patches and strips of broadleaved woodland are located within this section (TN146 and TN167), with the exception of Ashill wood which borders the study area with approximately 8ha within the eastern section. This woodland is designated as a local wildlife site due to its ancient and semi-natural woodland and ancient replanted woodland. As this wood is private, a full species list is unavailable. However, species identified include oak, ash, sycamore and hazel with occasional holly (TN119). This woodland is well connected to the wider landscape, including Everys Copse mixed woodland, a dismantled railway and many hedgerows. Additionally, broadleaved woodland forms riparian habitats, including Watercourse 21, where oak, hazel, sycamore and hawthorn were observed on it bankside (TN115).

Mixed Woodland

Everys Copse LWS and ancient woodland is approximately 6ha in size is approximately 10m north of Options 2/2D and 8A/8B. This woodland is privately managed, so it was not possible to fully inspect the woodland. Even still, species identified included oak, sycamore, scots pine, holly, leylandii and field maple, with an understory of wild garlic (TN120). Like Ashill wood, a neighbouring woodland, this woodland is also well connected to the wider landscape through a network of hedgerows leading to agricultural fields.

Plantation Woodland

One small area of plantation woodland was identified within this section, located south of Ashwell sewage treatment works. It is a small plantation of immature grey willow *Salix cinerea*, with a ground flora of nettle, pendulous sedge *Carex pendula* and false-oat grass *Arrhenatherum elatius* (TN159).

Scattered Trees

A variety of trees ranging in age, species and condition scatter the eastern section. This includes Jordons Park LWS, designated for its parkland and veteran trees, which is intercepted by Option 13. They are also located within hedgerows (TN142 and TN164-5), scattered in fields (TN151, TN156-7 and TN162), along watercourses (TN138, TN154 and TN152). Species identified include oak, ash and sycamore.

Due to the size and maturity of the some of the trees they may be subject to a Tree Preservation Order (TPO).

Hedgerows

A network of hedgerows are located within the eastern section of the study area. This includes intact hedgerows, species-poor hedgerows, hedgerows with trees and in some cases native species-rich hedgerows.

A species-rich hedgerow was identified at Hortmead Lane, just 10m north of Options 2/2D and 8A/8B consisting of hawthorn, oak, lime, field maple and blackthorn (TN136). Additionally, Mill Lane, north-west of Ashwell, is bordered by two species-rich hedgerows consisting of elder, alder, hawthorn, blackthorn and hazel. Ground flora identified includes dominant nettle, frequent creeping buttercup with occasional lords-and-ladies, lesser celandine and rare hart's-tongue and cleavers (TN160).

Running Water

A network of drains, wet ditches and eight watercourses run through the eastern section, with many being intercepted by some or all route options. Due to access, only one wet ditch (TN118) and four watercourses were observed during the survey. They are Venners Water (WC21), Cad Brook (WC25), Back Stream (WC26) and River Isle (WC27).

Venner's Water flows through Kenny and is intercepted by Options 2/2D, 8A/8B and 13, where the A358 is widened for all options. It was observed to be an important riparian habitat corridor formed by mature broadleaved woodland and diverse ground flora (TN115). Moving east, Cad Brook, flows north of the A303 and was noted as a medium flowing stream with gravel substrate (TN137 and TN141). It is intercepted by Options 2/2D and 8A/8B west of Ashwell Sewage Works. Back Stream, flows through the centre of the eastern section and is intercepted by Option 13 north of Horton Cross. It was observed to have very clear smooth flowing water with a gravel substrate and diverse bank flora (TN144 and TN158). Finally, the River Isle, was observed at multiple locations along its course. It was observed as an important riparian corridor meandering through variety of habitats (TN147, TN149, TN154, TN155, TN161, and TN163 and TN166).

Standing Water

There are approximately thirty seven ponds within the eastern section, however due to access, only one pond was observed. It is located east of Ashill and is bordered by dense scrub and bramble (TN124).

4.5 Protected Species

The information presented in this section has been compiled from direct observations of the species or suitable habitat present for all options as well as data obtained from the Somerset Environmental Records Centre (SERC) (Appendix C).

As the potential for protected species is common to all options this section covers all options.

4.5.1 Nesting Birds

The hedgerows, woodland, scrub and buildings across the study area provide suitable habitat for nesting birds. See Table 4.3 for evidence of nesting birds observed at each option.

Table 4.3: Evidence of nesting birds identified.

Option	Target Note
1	TN64
13, 2/2D, 8A/8B	TN44, TN113 and TN157

The local records check returned multiple records for nesting birds across the whole study area including recent records of county notable species such as common blackbird *Turdus merula* and barn swallow *Hirundo rustica.*

4.5.2 Schedule 1 Listed Birds

During the site walkover habitats suitable for the common kingfisher *Alcedo atthis* and barn owl *Tyto alba*, both Schedule 1 listed birds (W&CA 1981 (as amended), were identified. This includes many streams with steep nearly vertical earth banks which provides suitable habitat and a variety of dilapidated old buildings which could be utilised by the barn owls.

The local records check returned multiple records within the past ten years for the above species which are recorded within 2km of all options. This includes many records for the kingfisher at Creech St. Michael and on the River Isle.

4.5.3 Bats

4.5.3.1 Buildings

There are many residential buildings within 500m of the proposed route options. Those which fall within the Scheme footprint plus a minimum zone of 100m will require closer examination to determine if they have potential to support roosting bats.

Other structures identified as having bat roosting potential are listed in the Table 4.4 below along with the target note number.

Table 4.4: Structures identified with the potential to support roosting bats.

Option	Target note	Feature
1	TN18	Dilapidated building at Duddlestone Farm
	TN42	One storey agricultural building
	TN55	Dismantled railway bridge
	TN63	Old Bridge spanning watercourse
13, 2/2d, 8A/8B	TN15	Disused barn
	TN53	Storage area for containers
	TN56	Farm buildings
	TN86	One storey agricultural building
	TN101	Disused outbuilding
	TN153	Outbuildings at Winterhey Farm

4.5.3.2 Trees

Numerous mature scattered trees across the whole Scheme were considered to have the potential to support roosting bats. Features of trees used by roosting bats include:

- Natural cavities and woodpecker holes;
- Cracks/splits in major limbs;
- Loose and lifted bark
- Thick, close formed ivy stems; and;
- Dense epitomic growth

Please see Table 4.5 below for tree's identified with the above features to support roosting bats.

Table 4.5: Trees identified with the potential to support roosting bats.

Option	Target Note
1	TN11, TN15, TN18a, TN20, TN21, TN22, TN24, TN29, TN30, TN35, TN37, TN40, TN46, TN47, TN48, TN49, TN53, TN66, TN76, TN77, TN78, TN79, TN80, TN86, TN87, TN91, TN94 and TN96.
13. 2/2D, 8A/8B	TN24, TN30, TN39, TN52, TN55, TN64, TN67a, TN67b, TN68, TN69, TN70, TN71, TN72, TN73, TN74, TN78, TN79, TN80, TN84, TN85, TN117, TN122, TN123, TN125, TN127, TN128, TN130, TN131, TN132, TN133, TN134, TN138, TN140, TN140a, TN142, TN150, TN151, TN152, TN156, TN157, TN162, TN164 and TN165

4.5.3.3 Landscape Features

The tree lines, hedgerow, water features, grasslands and woodlands provide suitable areas for bats to commute and forage within all of which are abundant within the study area.

Recent records of bats in the study area where identified from the local records check this includes the common pipistrelle, soprano pipistrelle, noctule bat, daubenton's bat and long-eared bat *Plecotus sp*.

4.5.4 Badgers

The study area offers a variety of habitats for badgers including woodland, hedgerows and scrub which provides suitable cover for sett construction and high value areas to forage.

The site walkover (where access was permitted) identified evidence of badges in the form of latrines, snuffle pits and setts. See Table 4.6 below for badger evidence identified.

Table 4.6: Badger evidence identified.

Option	Target Note	Feature
1	TN2	Active badger sett with 3 visible entrances.
	TN19	Badger latrine and snuffle holes.
	TN23	Active badger sett with a minimum of 5 entrances.
	TN27	Active sett with 7 entrances.
	TN55	Active badger sett with approximately 6 entrances.
	TN71	Potential badger print.
13, 2/2D, 8A/8B	TN26	Potential badger outlier sett.
	TN34	Potential 6 entrance badger sett.
	TN77	Badger sett with numerous latrines.
	TN104	Badger latrine.
	TN105	Badger latrine.
	TN107	Potential outlier sett.
	TN109	Badger latrine.

Option	Target Note	Feature
	TN112	Badger latrine.
	TN126	Potential active badger sett.
	TN135	Potential badger print.

The local records check returned records for badgers within the study area the closet being near the A358 at Hatch Beauchamp.

4.5.5 Dormice

The walkover identified hedgerows, woodlands and scrub within the study area which are of high value for hazel dormouse *Muscardinus avellanarius* providing shelter and commuting opportunities as well as providing an abundance of food that can be used throughout the year. These habitats are also well connected throughout the study area and to surrounding habitats. Additionally, the dense scrub found in areas along the M5 and A358 verge offer moderate potential to support these species and Somerset is a known stronghold for dormice.

The local records check returned numerous records for the hazel dormouse within the study area one records of note was located within West Hatch, which Options 2/2D, 8A/8B and 13 pass through.

4.5.6 Reptiles

A range of habitats across the study area were identified during the site walkover that have potential to support common reptiles. For instance the verge of the M5 and A358 provide a mosaic of scrub, tall ruderal and long grassland habitat which provides suitable foraging/ commuting habitat, and shelter whilst suitable hibernacula, such as rubble and wood piles have also been identified. Woodland margins provide suitable habitat for foraging whilst hedgerows are important feature for reptiles to commute along.

Multiple records exist for common reptiles in the area, including the adder *Vipera berus*, slow worm and grass snake *Natrix natrix*.

4.5.7 Great Crested Newts

Suitable terrestrial habitats exists onsite for GCN, including commuting habitat along hedgerows, foraging habitat within grassland and tall ruderal vegetation as well as suitable shelter and hibernacula features including woodland.

Approximately one hundred and ninety one ponds are located within the study area for all options. Due to limited access four ponds were subject to a Habitat Suitability Index (HSI) survey. HSI scores are presented in Table 4.7 below and Appendix F.

Table 4.7: HSI scores

Option	Target Note	HSI Score
1	TN34	0.77
	TN18b	0.71
2/2D, 8A/8B and 13	TN108	0.64
	TN110	0.71

4.5.8 Water Vole and Otter

Twenty seven water courses and ditches cross all the route options and have the potential to support water voles and otters.

Evidence water vole and otter activity identified during the site walk over is outlined in Table 4.8 below.

Table 4.8: Evidence of water vole and otters identified.

Option	Target Note
1	TN88
2/2D, 8A/8B and 13	TN89, TN137 and TN145.

The local records check returned recent records of water vole and otter located within the River Isle, Fivehead River and its tributaries, Broughton Brook and Venners Water.

4.5.9 White Clawed Crayfish

Watercourses present across the Scheme offer the potential to support white clawed crayfish as they provide suitable refuge, food supply and favourable water quality. For instance, but not limited to, Back Stream, Venners Water and Broughton Brook were observed to have good water quality, with a pebble substrate, which will offer shelter to this species. No current records exist for this species within the study area, however due to their nature, it is difficult to detect their presence without conducting a full survey and therefore will result in local sightings being low to none. That said, they have been recorded in the past within the study are of Options 2/2D, 8A/8B and 13 at South Taunton Streams LNR.

4.5.10 Other Notable Species

Suitable habitats across the Scheme including tall ruderal vegetation, veteran trees and ancient woodland have been identified to have the potential to support terrestrial invertebrates. Records exist for these species within the study area, including the red listed and county notable brown hairstreak *Thecla betulae,* grizzled skipper *Pyrgus malvae* and Duke of Burgundy *Hamearis Lucina*.

The network of twenty seven water courses offers potential habitat for aquatic invertebrates and fish. For instance, the River Isle, is known for its angling as it supports a variety of fish species including common

roach *Rutilus rutilus* and river chub *Squalius cephalus*, whilst records exist in the study area for the European eel *Anguilla Anguilla,* a red listed species.

Across the study area, the arable and pasture fields have potential to support the brown hare *Lepus europaeus* whilst the woodland and hedgerows have potential to support hedgehogs *Erinaceus europaeus.* Both are species of principal importance. Additionally, roe deer *Capreolus capreolus* were observed within the study area for all options.

4.6 Valued Ecological Resources (VERs)

An evaluation of the habitats within study area for all options has been undertaken. This is presented in Table 4. 9 below and the definitions for ecological value are given in Appendix G (IEEM, 2006).

Table 4.9: Site evaluation.

	Option	Feature	Evaluation	Rationale
Designated Sites	1	Thurlbear Wood and Quarrylands SSSI	High	Internationally designated site w ith limited potential for substitution.
		Blackdow n Hills AONB	High	National designated site w ith limited potential for substitution.
Habitats	All options	Amenity grassland	Negligible	A low grade habitat of little ecological value.
		Arable	Negligible	A low grade habitat of little ecological value.
		Improved grassland	Negligible	A low grade habitat of little ecological value.
		Semi-improved neutral species-poor grassland	Low	Undesignated sites or habitats of some local biodiversity and earth heritage interest.
		Marshy grassland	Low	Undesignated sites or habitats of some local biodiversity and earth heritage interest
		Broadleaved semi-natural w oodland	Medium	Habitat of moderate value in the region/local area and identified as a Local Biodiversity Action Plan Habitat. May support the Hazel Dormouse.
		Mixed semi-natural w oodland	Medium	Habitat of moderate value in the region/local area. Also identified as a Local Biodiversity Action Plan Habitat.
		Orchard	Medium	Habitat of moderate value in the region/local area. Also identified as Local Biodiversity Action Plan habitat.
		Scattered trees	Medium	Undesignated sites or habitats of some local biodiversity and earth heritage interest. May be suitable for roosting bats.
		Scattered and dense Scrub	Low	Undesignated sites or habitats of some local biodiversity and earth heritage interest.
		Tall ruderal vegetation	Low local	Undesignated sites or habitats of some local biodiversity and earth heritage interest. Reptiles and invertebrates may use this habitat.
		Species-rich hedgerows	Medium	Habitat of moderate value in the region/local area. Hedgerow s identified as a Local

	Option	Feature	Evaluation	Rationale
				Biodiversity Action Plan Habitat.
		Species-poor hedgerows	Low	Undesignated sites or habitats of some local biodiversity and earth heritage interest.
		Hedgerows with trees	Medium	Habitat of moderate value in the region/local area. Hedgerows with trees identified as a Local Biodiversity Action Plan Habitat.
		Running water	High	Habitat of high importance to the region/ local area as well as being within local Biodiversity Action Plan for water and Wetlands. Has the potential to support protected species including fish, invertebrates, otters, water voles, white clawed crayfish and kingfisher.
		Standing Water	Moderate	Habitat of moderate value in the region/local area. Ponds and ditches identified as a Local Biodiversity Action Plan Habitat.
Protected Species	All Options	Bats	High	Species protected by European Legislation.
		Dormouse	High	Species protected by European Legislation.
		Nesting Birds	Moderate	Species protected by National Legislation.
		Schedule 1 listed birds	High	Species protected by European Legislation.
		Badger	High	Species protected by National Legislation.
		Reptiles	Moderate	Species protected by National Legalisation
		GCN	High	Species protected by European Legislation.
		Water voles	High	Species protected by European Legislation.
		Otters	High	Species protected by European Legislation.
		WCC	Moderate	Species protected by European Legislation.
		Invertebrates	Moderate	Species protected by European Legislation.
		Fish	Moderate	Species protected by National Legislation.

5 Assessment of Impacts

5.1 Potential Impacts

The assessment of impacts needs to consider areas directly within the land taken for the proposed Options, but also adjacent areas of ecological value. Impacts from the proposed works construction and operational phase will also be assessed to establish whether they are of a temporary or permanent nature.

5.1.1 Designated Sites

Three statutory designated sites are within 1km of Option 1, they are Thurlbear Wood and Quarrylands SSSI, (100m north), Blackdown Hills AONB (200m south) and Bickenhall Orchard Local Nature Reserve (700m south), which is also 700m south of Options 2/2D, 8A/8B and 13. It is not anticipated that any of the four options will impact the LNR due to its nature and distance from the Scheme. However, due to the distance and large scale of the Scheme without appropriate mitigation, there is potential to directly and irreversibly affect the SSSI and AONB. Four designations (Hestercombe House, Brackets Coppice, Exmoor and Quantock Oakwoods and Beer Quarry SACs) that have qualifying features related to important assemblages of bat species have been identified within 30km of the Scheme. These species are very mobile and may enter the Schemes footprint, which has habitat including ancient woodland that is considered suitable for roosting, foraging and commuting bat species. An Assessment of Impacts upon European Sites (AIES) should be undertaken to establish if the Scheme is likely to have a significant impact upon these bat species. If a significant effect is considered likely then further surveys to determine bat activity in the locality would be required to determine if the rarer bat species for which these sites are designated utilise these habitats.

There are twenty seven watercourses within the study area, with many flowing through or within close proximity to a designated site. Some of these designated sites have qualifying features including water vole and otters, which may use these watercourses to commute into the Schemes footprint. Additionally, there is potential to directly affect these designated sites through contamination of the watercourses if mitigation measures are not adhered to.

5.1.2 Habitats

The ecological importance of the habitats present on the site has been assessed against their presence in the United Kingdom (UK) and Local Biodiversity Action Plans (BAPs), on Section 41 (S41) of the Natural Environment and Rural Communities Act (NERC, 2006) and their ability to support protected or notable species.

In the absence of mitigation, the proposed works for all options are likely to result in the loss of habitats of high to medium conservation value such as running water, broadleaved semi-natural woodland and species-rich hedgerows, which are listed on the Somerset BAP and Taunton Deane BAP. All Options have the potential to cause habitat fragmentation, which will reduce the extent of habitat available for foraging and dispersing wildlife which may result in the isolation of species populations.

During construction, there is also likely to be temporary impacts of habitat loss and damage due to access, general working areas and compound locations. Works in close proximity to trees have the potential to adversely affect them through ground compaction and root damage. Whilst works in close proximity to watercourses have the potential to adversely affect the surrounding environment through oil and chemical spills which may pollute the watercourse. There would be increased levels of airborne pollutants during the construction phase and once the Scheme is operational it has the potential to adversely affect sensitive habitats, specifically those within the designated sites such as ancient woodland.

After the Scheme commission and reinstatement of habitats the impacts would be minimal during operation. No further land take would be required as a result of the Scheme. Habitat creation and compensation to replace those damaged or permanently lost would be required in order to ensure there are no long-term impacts as a result of the Scheme.

5.1.3 Protected Species

All route options have the potential to impact upon numerous protected species during construction and operation in the absence of appropriate mitigation. This includes habitat loss for badgers and nesting birds, which were both observed on site and potential habitat loss for bats, GCN, water vole, otters, dormice, Schedule 1 listed birds (W&CA 1981 (as amended), reptiles, invertebrates, fish and WCC, if confirmed to be present on site. There is also the potential to cause noise disturbance and visual intrusion to rare and protected species within the construction footprint and adjacent habitats.

6 Outline Mitigation and Recommendations

In accordance with the National Planning Policy Framework (NPPF), works should not only avoid or mitigate ecological impacts, but also seek to compensate and enhance the biodiversity on a site. Therefore, compensation and enhancement measures for the proposed Option need to be undertaken owing to the potential ecological impact of the site.

There is likely to be scope for further ecological enhancement of the site depending on the detailed plans of the proposed option. This may be in the form of additional native trees and hedgerows, managed in keeping with local traditionally hedge laying, creation of ponds and native species-rich grassland verges and edges, enhancement of scrub / grassland interfaces, and the provision of nesting and roosting opportunities for birds and bats.

Any ecological enhancement should be linked to existing wildlife corridors where practical and possible or proposed establishment for wildlife corridors and sanctuary areas on site. This will reduce habitat fragmentation from the proposed Option. Overall there is potential by following best practice principles for achieving overall gains for wildlife and ensuring the functions of the NERC Act (2006) are achieved.

Works within areas known to support dormice, bats, GCN, white clawed crayfish, otters, water voles and badgers will need to be undertaken in accordance with a Natural England Development licence due to the high level of protection afforded to these species. Licenses are likely to include restrictions on when works can be undertaken, additional mitigation required to compensate for the habitat lost and the need for supervision by an experienced and licensed ecologist.

Due to the timing of the Phase 1 habitat surveys it is recommended that botanical surveys such as hedgerow surveys, river habitat surveys, river corridor surveys and NVC are undertaken in areas with the potential to support important habitats or rare species which will be affected by the Scheme. These may include the grassland and woodland habitats.

All scrub, tree and hedgerow clearance should be kept to a minimum. Any clearance that is necessary should be undertaken between August and the end of February i.e. outside the bird breeding season. If scrub or trees are to be removed within the nesting bird season, then nesting bird checks will be required and the necessary mitigation measures put in place.

6.1 Protected Species

6.1.1 Summary of Recommended Phase 2 Surveys

A summary of the recommended Phase 2 surveys is presented in Table 6.1 below which includes the methods, survey period and likely duration (for one option) of the surveys and licensing process if required.

Table 6.1: Recommended Phase 2 Surveys

Ecological Feature	Options	Biodiversity Value/Legal Protection	Survey Methods	Optimal Survey Period	Duration of Survey (approximate)	Time required for licence application
Hedgerow	All	Protected under the Hedgerow Regulations (1997). UK BAP and local priority habitat.	Survey of species within hedgerow. Only required in areas where removal of hedgerow is planned.	May - September	2 weeks	N/A
NVC	All	NPPF UK BAP and local priority habitat.	Survey of important habitats and rare species.	May - September	2 weeks	N/A
Dormice	All	Protected under the EC Habitats Directive and the W&CA 1981 (as amended). UK BAP and local priority species	Nut search, Can only be undertaken in woodlands with enough fruiting hazel.	Mid - August to December	2 weeks	If a dormouse chewed nut is identified no further surveys are required and a licence applied for (see below). .
			Nest tube survey: Only required in areas where removal of woodland or hedgerow is planned.	March to November	3 to 6 months for nest tube survey if licence likely.	15 working days to write licence application + 30 working days for NE to process licence
Bats	All	Protected under the EC Habitats Directive and the W&CA 1981 (as amended). UK BAP and local priority species.	Roost Surveys: Tree Climbing Assessment Internal Building inspection	October to March	4 weeks	20 working days to write licence application + 30 working days for NE to process licence
			Emergence and Re-entry surveys	May to September (key months June to August)	3 visits for activity surveys per feature (mature tree/building). If a bat roost is confirmed on site, additional survey work may be required to support a licence application.	
			Activity Surveys	May to October	One or two surveys per month	

Ecological Feature	Options	Biodiversity Value/Legal Protection	Survey Methods	Optimal Survey Period	Duration of Survey (approximate)	Time required for licence application
			Transect surveys to identify commuting and foraging routes and roost sites	(key months June to August)		
			Mist Netting Surveys	Once a month during April, May, August and September.		
Great crested newts	All	Protected under the EC Habitats Directive and the W&CA 1981 (as amended). UK BAP and local priority species	Habitat Suitability Assessment (HSI) to determine further surveys.	November to March	3 weeks for HSI assessment.	15 working days to write licence application + 30 working days for NE to process licence.
			Presence /absence surveys: Bottle trapping, torchlight counts and egg searches of all water bodies within study area.	April to mid-June	4 visits per pond, with a further 2 visits if great crested newts are found to assess the population size	
Badgers	All	Badgers are protected under the Protected of Badgers Act (1992).	Further survey to identify and class all (where possible) badger setts on site.	February to March	2 weeks .	15 working days to write licence application + 30 working days for NE to process licence.
			Badger Baiting: Further survey to understand level of badger activity and identify their territorial boundaries.	February to March	12 visits per area within 2 to 3 weeks	
			Closure of sett	End of June – end of November inclusive	21 clear days (no activity)	
Terrestrial Invertebrates		Some species protected under the EC Habitats Directive and the W&CA 1981 (as amended).	Target surveys including walkover surveys, sweep net survey and pitfall traps to be carried out monthly by a suitably qualified ecologist.	April – October.	2 days per month from April - October	

Ecological Feature	Options	Biodiversity Value/Legal Protection	Survey Methods	Optimal Survey Period	Duration of Survey (approximate)	Time required for licence application
Water vole and Otter	All	Protected under the EC Habitats Directive and the W&CA 1981 (as amended). UK BAP and local priority species	Initial walkover to identify suitable habitats and search for evidence of activity along bankside.	1 Survey in April – August. 1 Survey in September – October	2 weeks	15 working days to write licence application + 30 working days for NE to process licence.
Fish	All	Some species protected under the EC Habitats Directive and the W&CA 1981 (as amended).	Habitat walkover to identify suitable habitats, electric fish survey and red count survey.	May - September	2 weeks	15 working days to write licence application + 30 working days for NE to process licence.
Aquatic Invertebrates	All	Some species protected under the EC Habitats Directive and the W&CA 1981 (as amended).	Macro invertebrate sampling and water quality testing carried out by a suitably qualified ecologist.	May - September	2 weeks	licence.
Reptiles	All	Protected under the W&CA 1981 (as amended).	10 visual surveys to determine populations using artificial refuge.	During suitable weather conditions between Mid-March to Mid-June and Mid-July to mid-October.	11 days per area	N/A
Breeding Birds.	All	Protected under the W&CA 1981 (as amended) and some species are listed under Schedule 1 (W&CA).	Recording of bird calls using BTO standard survey guidelines.	3 visits per suitable area, between March and June.	2 weeks	N/A
Kingfisher	All	Protected under the EC Habitats Directive and the W&CA 1981 (as amended).	Site walkover by a suitably qualified ecologist to determine potential and or presence of this species.	2 survey visits. Activity search from November – March (Species should be more conspicuous, due to dormant vegetation). Second survey from April – June to coincide with breeding season.		15 working days to write licence application + 30 working days for NE to process licence.
WCC surveys	All	Protected under the W&CA 1981 (as amended).	Survey involving manual searching, hand netting, torching or trapping.	July - September	2 weeks	15 working days to write licence application + 30 working days for

Ecological Feature	Options	Biodiversity Value/Legal Protection	Survey Methods	Optimal Survey Period	Duration of Survey (approximate)	Time required for licence application
						NE to process licence.
Barn Owls	All	Schedule 1 of the W&CA 1981 (as amended).	Initial walkover to identify potential nesting sites. Internal building inspections and tree inspections.	One visit per feature from November to February.	2 Weeks	15 working days to write licence application + 30 working days for NE to process licence
River Corridor and River Habitat Survey	All	N/A	Visual assessment of watercourses.	1 survey visit for 3 watercourses between June and August.	1 survey per watercourse.	N/A

7 Conclusion

A rapid PEA was undertaken to assess the potential presence of protected and notable species within and adjacent to four route Options: 1, 2/2D, 8A/8B and 13. Habitats of value effected by all options include areas of woodland, hedgerows, grassland, scrub and running water which form a mosaic of habitats likely to support nesting birds, badgers, bats, GCN, water vole, otters, dormice, schedule 1 listed birds, reptiles and possible White Clawed Crayfish.

All options will affect habitats of varying value and the loss of these habitats is considered likely to impact on protected species. Having considered the likely effect of each option on the identified Value Ecological Resources (VERs), Option 1 is considered to have the highest impact due to the rural nature of the area and its close proximity to statutory designated sites. It also passes through a variety of habitats; notably woodland, hedgerows, running water and grassland, which together form a mosaic of habitats of greater biodiversity value.

Options 2/2D, 8A/8B and 13 pass through similar habitats which have the potential to support protected species. However, these options follow the A358 existing corridor in areas, where the surrounding habitat is considered to be lower in ecological value due to the road and local infrastructure

8 References

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