

# **M3 Junction 9 Improvement**

**Scheme Number: TR010055**

## **6.1 Environmental Statement Chapter 8 Biodiversity**

**APFP Regulation 5(2)(a)**

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## **6.1 ENVIRONMENTAL STATEMENT - CHAPTER 8: BIODIVERSITY**

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## 8 Biodiversity

### 8.1 Introduction

8.1.1 This chapter presents the findings of the assessment of the construction and operation of the M3 Junction 9 Improvement Scheme (hereafter referred to as the Scheme) on biodiversity. This chapter outlines legislative, policy framework and guidance, describes the assessment methodology, study area, baseline conditions, an overview of potential impacts, mitigation measures, likely residual effects, monitoring and a summary. This chapter has been prepared by a competent expert. Further details of their qualifications and expertise are provided in **Appendix 1.1 (Competent Expert Evidence)** of the **Environmental Statement (ES) (Document Reference 6.3)**.

8.1.2 This chapter should be read in conjunction with **Figures 8.1 – 8.5** of the **ES (Document Reference 6.2)** and **Appendices 8.1 to 8.3** of the **ES (Document Reference 6.3)** which comprise:

- ES Appendix 8.1[a-z2]: Various baseline data reports
- ES Appendix 8.2: Biodiversity Net Gain Assessment Report
- ES Appendix 8.3: Assessment of Operational Air Quality Impacts on Biodiversity

8.1.3 This chapter should be read in parallel with **Chapter 7 (Landscape and Visual)**, **Chapter 9 (Geology and Soils)**, **Chapter 11 (Noise and Vibration)**, **Chapter 13 (Road Drainage and the Water Environment)**, **Chapter 14 (Climate Change)** and **Chapter 15 (Cumulative Effects)** of the **ES (Document Reference 6.1)**.

### 8.2 Consultation

Consultation and engagement has informed the biodiversity assessment. Comments and responses to the Scoping Opinion received in November 2020 are provided in **Appendix 4.2 (Scoping Comments and Responses)** of the **ES (Document Reference 6.3)** and comments and responses received during statutory consultation between May and June 2021 are provided in **Appendix K** of the **Consultation Report (Document Reference 5.1)**. **Table 8.1** summarises other relevant consultation / engagement undertaken together with a response.

Table 8.1: Consultation undertaken relevant to Biodiversity

Reference	Comment	Response
Meeting with Natural England on 26/07/2021 to	<i>Current survey work [is] sufficient to inform proposed badger mitigation, although may be sensible to undertake</i>	Bait marking surveys are being undertaken and the results would be presented in the badger licence application.

Reference	Comment	Response
discuss protected species licencing	<p><i>bait marking surveys.</i> <i>Proposed badger mitigation is acceptable.</i></p> <p><i>Proposed mitigation for dormice seems appropriate, although Natural England requested further information on details. Natural England requested cumulative impacts with Smart Motorways project is considered.</i></p>	<p>Further detail on dormice mitigation would be provided within the dormice licence application.</p> <p>In January 2022 the UK Government announced a pause to planned all lane running (ALR) not yet in construction, until 5 years of safety data is available. As such the design and assessment of the Scheme has been updated assuming the absence of the M3 Junction 9 – 14 ALR, and no cumulative impacts are anticipated.</p>
Meeting with Natural England 28/09/2021 to discuss the Environmental Masterplan, and update to HRA work.	<i>Natural England requested design ensured connectivity for wildlife was maintained and enhanced.</i>	The current design shown on <b>Figure 2.3 (Environmental Masterplan)</b> of the <b>ES (Document Reference 6.2)</b> maintains, and where possible, enhances, connectivity for wildlife.
Meeting with Environment Agency 05/08/2021 to discuss the Environmental Masterplan, and update to HRA work.	<i>Environment Agency provided comment on the current Environmental Masterplan, and discussion on the scale of proposed habitat creation.</i>	The current design is presented on <b>Figure 2.3 (Environmental Masterplan)</b> of the <b>ES (Document Reference 6.2)</b> .

### 8.3 Legislative, policy framework and guidance

8.3.1 This assessment has been undertaken considering current legislation, together with national, regional and local plans and policies. A list is provided below and further detail regarding National Policy can be found in the **Case for the Scheme (Document Reference 7.1)** and the **National Policy Statement for National Networks Accordance Table (Document Reference 7.2)**:

- Natural Environment and Rural Communities (NERC) Act 2006
- Protection of Badgers Act 1992
- Wildlife and Countryside Act 1981

- Wild Mammals (Protection) Act 1996
- Conservation of Habitats and Species Regulations 2017
- Hedgerow Regulations 1997
- National Policy Statement for National Networks (2014)
- National Planning Policy Framework (2021)
- Planning Practice Guidance (online resource)
- Hampshire Minerals and Waste Plan (2013)
- South Downs Local Plan (2019)
- The People and Nature Network (PANN), South Downs National Park Authority (2020)
- Winchester District Draft Local Plan 2018 -2038 (emerging)
- Winchester District Local Plan Part 1 – Joint Core Strategy (2013)
- Winchester District Local Plan Part 2 – Development Management and Site Allocations (2017)

8.3.2 In addition to the legislation and national and local planning policies listed above, this assessment has also been carried out in accordance with the following professional standards and guidance:

- DMRB LA 108 Biodiversity (Highways England, 2020)
- DMRB LA 115 Habitats Regulations Assessment (Highways England, 2020)
- Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018)
- CIEEM's Advice Note of the Lifespan of Ecological Reports and Surveys (2019)

## 8.4 Assessment methodology

### Scope of the assessment

8.4.1 This chapter presents an assessment of impacts upon biodiversity receptors during both the construction and operation of the Scheme.

### Study area and baseline approach

8.4.2 The study area is defined within **Section 8.5**. Baseline data (and identification of biodiversity receptors) is outlined in **Section 8.6** and in **Appendix 8.1(a-z)** of the **ES (Document Reference 6.3)** which has been informed through gathering



readily available desk-based information, data from stakeholders and surveys. Further information is outlined in the paragraphs that follow.

### **Desk Study**

- 8.4.3 Data in relation to the Scheme was initially requested from Hampshire Biodiversity Information Centre in 2016. This included biological records in relation to statutory and non-statutory nature conservation sites, notable habitats and species, and controlled species.
- 8.4.4 To ensure desk study data used to inform this ES is current and reflects the current Scheme, updated desk study records were obtained from Hampshire Biodiversity Information Centre in July 2021. In addition, due to the Air Quality Affected Road Network (ARN) extending into Berkshire, desk study information in relation to designated areas and ancient woodland was also requested from Thames Valley Environmental Records Centre (TVERC) in July 2021.
- 8.4.5 In addition to data from the local records centres, the following data sources have been used to inform the desk study:
- The Multi Agency Geographic Information for the Countryside website ([www.magic.gov.uk](http://www.magic.gov.uk) - MAGIC) was used to provide information on statutory designated nature conservation areas, Habitats of Principal Importance (HPI) as listed under the NERC 2006, and European Protected Species
  - Joint Nature Conservation Committee (JNCC) and Natural England websites were used to obtain detailed information on statutory designated nature conservation areas
  - The UK Government website was used to obtain information on fisheries
  - Ordnance Survey mapping and aerial imagery to identify broad habitat types
  - The Environment Agency have provided information on aquatic species including *River Itchen brook lamprey condition assessment* (APEM, 2017), and anecdotal information on southern damselfly records
- 8.4.6 The current desk study data is presented within **Appendix 8.1y (Desk Study Report)** of the **ES (Document Reference 6.3)**.

### **Field Surveys**

- 8.4.7 In order to provide further detail of the biodiversity receptors within the study area, habitat and species surveys listed in **Table 8.2** were undertaken. The scope of these surveys was determined following the 2017 Phase 1 habitat survey, and through consultation with stakeholders, including Natural England, as described in the *M3 Junction 9 Improvement Environmental Impact Assessment Scoping Report* (2020).
- 8.4.8 Some of the baseline surveys were started prior to the selection of the preferred option. Where necessary, the survey coverage has been updated during



surveys between 2019-2021. The reports referenced in **Table 8.2** provide further information of the areas surveyed for the biodiversity features.

Table 8.2: Summary of field survey methods

Biodiversity Survey	Methods	Reference
Habitats, notable plants, and invasive plants	<p>Phase 1 habitat survey – March to August 2017</p> <p>National Vegetation Classification (NVC) survey – August 2017</p> <p>Habitat verification survey (using UKHAB methodology), orchid and notable plant species survey, invasive plant survey – June 2020</p> <p>Preliminary Ecological Appraisal 2020 (of areas recently added to Application Boundary)</p> <p>Habitat verification survey (using UKHAB methodology) – June 2022</p>	<p><b>Appendices: 8.1c, 8.1h, 8.1m, 8.1p (confidential), 8.1z of the ES (Document Reference 6.3)</b></p>
Amphibians (including great crested newt)	<p>Habitat Suitability Index (HSI) assessment – 2017, 2019 and 2021.</p> <p>Environmental DNA (eDNA) – 2017, 2019 and 2021.</p>	<p><b>Appendices: 8.1e and 8.1v of the ES (Document Reference 6.3)</b></p>
Aquatic invertebrates	<p>Habitat assessment for southern damselfly and white-clawed crayfish – 2020.</p> <p>White-clawed crayfish baited trap and manual search surveys 2022</p>	<p><b>Appendices: 8.1n, 8.1o, and 8.1z2 of the ES (Document Reference 6.3)</b></p>
Badgers	<p>Badger survey 2017, 2018, 2019, 2021.</p>	<p><b>Appendices: 8.1a (confidential), 8.1u (confidential), and 8.1p</b></p>

Biodiversity Survey	Methods	Reference
		<b>(confidential)</b> of the <b>ES (Document Reference 6.3)</b>
Bats (foraging and commuting)	<p>Bat activity surveys- May to October 2017.</p> <p>Update bat activity surveys – August, September and October 2020.</p> <p>Bat trapping surveys autumn 2020 and spring 2021.</p>	<b>Appendices: 8.1b, 8.1r, 8.1s of the ES (Document Reference 6.3)</b>
Bats (roosting)	<p>Preliminary Bat Roost Assessment - 2017 and 2019</p> <p>Bat Tree Climbing Survey February 2019</p> <p>Bat roost emergence surveys August 2020 and 2021</p>	<b>Appendices: 8.1i, 8.1r, 8.1s of the ES (Document Reference 6.3)</b>
Breeding birds	Breeding bird survey - 2017 and 2019.	<p><b>Appendix 8.1d of the ES (Document Reference 6.3)</b></p> <p>M3 Junction 9 Improvement Scheme: Breeding Bird Survey (Highways England, 2019)</p>
Hazel dormouse	Nest tube survey - May to November 2017	<b>Appendix 8.1f of the ES (Document Reference 6.3)</b>
Otter	<p>Otter surveys of River Itchen - June and August 2017, updated June 2020.</p> <p>Otter survey of terrestrial habitats July 2021.</p>	<b>Appendices: 8.1g (confidential), 8.1n (confidential), 8.1x of the ES (Document Reference 6.3)</b>
Reptiles	Reptile survey within suitable habitat - June and September 2017.	<b>Appendix 8.1j of the ES (Document Reference 6.3)</b>

Biodiversity Survey	Methods	Reference
Terrestrial invertebrates	Walkover survey - June 2017. Detailed invertebrate survey 2020.	<b>Appendices: 8.1k and 8.1o of the ES (Document Reference 6.3)</b>
Water vole	Water vole surveys undertaken in June and August 2017. Updated September 2020.	<b>Appendices: 8.1l and 8.1t of the ES (Document Reference 6.3)</b>
Wintering birds	Wintering bird surveys undertaken between October 2017 and March 2018.	M3 Junction 9 Improvement Scheme: Wintering Bird Community Survey Report

8.4.9 Due to the age of some of the survey data contained in the above reports, a review of all baseline data has periodically been undertaken with regard to CIEEM's *Advice Note of the Lifespan of Ecological Reports and Surveys* (2019). Recent habitat survey data demonstrates that there have been no substantive changes in habitats within the Application Boundary<sup>1</sup> since the first surveys were conducted, and therefore for some species and species groups, the data is considered to be sufficiently robust to inform the assessment process. Where necessary, ecological surveys have been updated during the EIA process to confirm certain data remains valid.

### Approach to design, mitigation and enhancement measures

8.4.10 The Scheme has been designed to avoid or reduce effects on biodiversity. Embedded mitigation is listed within **Chapter 4 (Environmental Assessment Methodology)** of the **ES (Document Reference 6.1)**. Essential mitigation measures have been identified within this chapter and discussed with Natural England. This mitigation is also included within the **first iteration Environmental Management Plan (fiEMP) (Document Reference 7.3)**.

### Assessment approach – level of impact

8.4.11 The baseline conditions within and adjacent to the Scheme have been well defined following data gathering undertaken between 2016 and 2021. This has allowed an importance level to be attributed to each ecological feature within the study area in accordance with CIEEM's geographic framework (CIEEM,

<sup>1</sup> Land directly affected by the Scheme

2018). The geographical framework has used the following levels of nature conservation importance:

- International (such as areas designated under European or international legislation, e.g. Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites)
- National (such as areas designated under national legislation, e.g. Sites of Special Scientific Interest (SSSI); and ancient woodlands)
- County (such as areas designated through the local planning system (e.g. Sites of Importance for Nature Conservation), populations of species important in a county context (e.g. a species with a restricted range, or a diverse assemblage of a species group))
- Local (undesigned ecological features such as old hedges, woodlands, ponds, or populations of species important in a local context (e.g. species which are common in the county but may have specific habitat requirements))
- Less than local (other habitats or species of limited or negligible ecological interest, e.g. plantation woodlands or arable farmland, or populations of species which are common and widespread or unlikely to be of importance in a local context)

8.4.12 In order to determine the likelihood of a significant ecological effect, it is necessary to identify whether an ecological feature is sufficiently important for a significant effect upon it to be material in decision-making. Ecological features of 'Local' level importance or above have been classified as being 'Important' ecological features. Identified 'Important' ecological features have been considered in full and are reported in this chapter, allowing the assessment to focus only on those impacts which are potentially environmentally significant.

8.4.13 Where protected or controlled species are present within or adjacent to the Scheme, which are not considered 'Important' ecological features, measures have been included in the mitigation package to enable legal compliance, and where possible to provide an enhancement.

8.4.14 A logical and transparent assessment of impacts and associated effects on each 'Important' ecological feature has been presented within this chapter for the construction and operation of the Scheme. The assessment of effects takes into account the potential impacts to each important biodiversity receptor following the implementation of mitigation measures. In each case the level of impact and the significance of the effect has been expressed in accordance with the criteria provided in DMRB LA 108 Biodiversity (Highways England, 2020), see **Table 8.3** and **Table 8.4**.

8.4.15 The terms impact and effect are used within this chapter in accordance with the following definitions (as provided by the CIEEM guidelines):

- Impact: actions resulting in changes to an ecological feature. For example, the construction activities of a development removing a hedgerow
- Effect: outcome to an ecological feature from an impact. For example, the effects on a dormouse population from loss of a hedgerow

Table 8.3: Level of impact and typical descriptions (taken from Table 3.11 of DMRB LA 108 (Highways England, 2020))

Level of impact (change)		Typical description
Major	Adverse	1) Permanent/irreversible damage to a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource.
	Beneficial	1) Permanent addition of, improvement to, or restoration of a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource.
Moderate	Adverse	1) Temporary/reversible damage to a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource.
	Beneficial	1) Temporary addition of, improvement to, or restoration of a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource.
Minor	Adverse	1) Permanent/irreversible damage to a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
	Beneficial	1) Permanent addition of, improvement to, or restoration of a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
Negligible	Adverse	1) Temporary/reversible damage to a biodiversity resource; and

Level of impact (change)		Typical description
		2) the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
	Beneficial	1) Temporary addition of, improvement to, or restoration of a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
No Change		No observable impact, either positive or negative.

### Assessment approach – level of impact

8.4.16 As above, the significance of the effect has been expressed in accordance with the criteria provided in DMRB LA 108 Biodiversity (Highways England, 2020) and replicated in **Table 8.4**.

Table 8.4: Significance matrix (taken from Table 3.13 of DMRB LA 108 (Highways England, 2020))

	Level of impact					
		No change	Negligible	Minor	Moderate	Major
Resource importance	International or European importance	Neutral	Slight	Moderate or large	Large or very large	Very large
	UK or national importance	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Regional importance	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	County or equivalent authority importance	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Local importance	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight
	Less than local	Not considered an important ecological feature, no assessment undertaken				

8.4.17 Where an effect could be one of two gradings, professional judgement has been used and explained to determine which effect is applicable.

8.4.18 The duration of temporary environmental effects are discussed using both human timeframes as well as being defined in relation to ecological characteristics of a habitat or population. In the context of the lifetime of the Scheme, effects have been defined as follows:

- Short-term – less than five years
- Medium-term – five to ten years
- Long-term – > ten years
- Permanent – Once the Scheme is completed and operational

8.4.19 Where the ecology of an ecological receptor would cause these timeframes to differ, this is discussed within the assessment.

8.4.20 Significant effects are those that remain within the moderate, large or very large categories once mitigation has been taken into account.

8.4.21 The assessment presented within this chapter has concluded with the residual effects on biodiversity resources in accordance with CIEEM's *Guidelines for Ecological Impact Assessment for the UK and Ireland* (CIEEM, 2018), stating whether effects are 'significant' or 'not significant' at the relevant geographical level of importance.

8.4.22 Assessment of impacts to designated areas for nature conservation from exhaust emissions from vehicles has been undertaken in line with *DMRB LA 105 Air Quality* (Highways England, 2019). Traffic modelling data has been used to provide predictions of traffic flows, for the ARN<sup>2</sup>. This data has been used to calculate emissions of pollutants such as Nitrous Oxide (NO<sub>x</sub>) during operation of the Scheme using data from Defra's Emission Factor Toolkit (EFT) and in accordance with LA 105 (Highways England, 2019). For designated areas, the annual average NO<sub>x</sub> concentration and resultant nitrogen deposition rate have been determined in accordance with LA 105 (Highways England, 2019) and combined with background concentrations and deposition rates. Where the air quality modelling identifies potential exceedances to designated areas, these have been subject to further assessment to determine the potential ecological effects. This further assessment includes looking at the sensitivity of the habitats or species to the pollutants, the predicted emissions in the context of exceedance thresholds, and the predicted emissions across the designated area as a whole. Further details of the air quality modelling which has been used

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<sup>2</sup> defined as the road network where the Scheme results in traffic change >1000 Annual Average Daily Traffic



to inform this assessment can be found in **Chapter 5 (Air Quality)** of the **ES (Document Reference 6.1)**.

8.4.23 A summary of potential effects to European sites, including the River Itchen Special Area of Conservation (SAC), are presented in this chapter, with full results presented in the **Habitats Regulations Assessment (Document Reference 7.5)**. The **HRA (Document Reference 7.5)** has been undertaken in accordance with *LA 115 Habitats Regulations assessment* (Highways England, 2020) and *Advice note ten: Habitats Regulations Assessment relevant to nationally significant infrastructure* (The Planning Inspectorate, 2017).

### Reasonable worse case parameters for assessment

8.4.1 An assessment has been conducted within the Limits of Deviation (LoD) outlined within **Chapter 2 (The Scheme and its Surroundings)** of the **ES (Document Reference 6.1)**. The vertical and lateral LoD for the Scheme have been reviewed with respect to sensitive receptors identified within this ES chapter. The vertical and lateral LoD would not affect the conclusions of the assessment reported in this chapter.

### Assessment assumptions and limitations

8.4.2 This assessment is informed by an extensive data collection exercise undertaken between 2016-2021, which has provided a robust data set sufficient to inform this assessment.

8.4.3 Data supplied by records centres provides useful baseline information on the species that have been recorded within a local area and details of sites with nature conservation designations. This data often includes surveys undertaken by third parties on an 'ad hoc' basis so may be incomplete. Absence of species records may not therefore indicate absence of that species from an area. However, despite these limitations, sourcing existing ecological data is a useful component part of the ecological assessment process and has been considered carefully in this assessment.

8.4.4 Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour, and therefore, the ecological surveys undertaken to support this chapter may not produce a complete list of plants and animals. The absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it would not be present in the future. However, the results of these surveys have been reviewed and are considered to be suitably robust to inform this assessment.

8.4.5 Whilst survey coverage was extensive, access was not always possible to some areas. This included some sections of highway verge located away from the main areas of impact which were inaccessible due to health and safety considerations in relation to working close to the live highway network. In these instances, data was gap-filled through use of desk study data, results from

adjacent areas where survey was possible, knowledge of the environmental conditions and land use of the local area, and ecological interpretation.

- 8.4.6 During the 2021 great crested newt eDNA surveys, landowner permission was not received for five ponds. However, 15 ponds were surveyed, and the results, along with historical survey data, provides confidence in the likely status of great crested newts within the study area.
- 8.4.7 Further limitations to species specific surveys can be found in the relevant technical reports in **Appendices 8.1a to 8.1z2** of the **ES (Document Reference 6.3)**, however none of these are considered to affect the robustness of the assessment set out in this chapter.

## 8.5 Study area

- 8.5.1 Due to differing zones of influence (Zoi) over which ecological features may be subject to impacts and subsequent effects, both during construction and operation, a range of study areas have been used. Selection of the study areas has been informed by and is in accordance with the *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018).
- 8.5.2 For the desk study, the following study areas have been used, which are presented on **Figures 8.1 – 8.5** of the **ES (Document Reference 6.2)**:
- 2km radius for protected species records (excluding bats)
  - 5km radius for bats
  - 2km radius for nationally and locally designated statutory areas
  - 2km radius for non-statutory designated areas
  - 2km radius for notable habitats
  - 10km radius for SACs and Special Protection Areas (SPA), extended to 30km for SACs designated for bats
- 8.5.3 The survey area used to collect habitat data comprised all land within the Application Boundary, and up to 500m from the Application Boundary where appropriate.
- 8.5.4 The survey areas used to collect data on species and species groups comprised all land within the Application Boundary where suitable habitat for the given species is present. In some instances, e.g. great crested newts, the survey area extended beyond the Scheme to provide contextual information on the surrounding area.
- 8.5.5 Some of the initial surveys of species and species groups used a survey area which was based on an earlier iteration of the Scheme. As the design of the Scheme has evolved, surveys have been reviewed to make certain they are sufficient to inform the assessment of the design for which Development

Consent is sought. Where necessary, the survey area has been increased commensurately and the surveys have been updated to provide sufficient information (for instance, surveys of additional ponds for great crested newts have been undertaken following the increase in area within the Application Boundary (see **Chapter 3 (Assessment of Alternatives)** of the **ES (Document Reference 6.1)** for further information).

8.5.6 When discussing the study area throughout this chapter, for each receptor this is taken to be a combination of the desk study search area and the survey area, as described above in **Paragraphs 8.5.2-8.5.5**.

8.5.7 Due to potential operational effects from exhaust emissions from vehicles, the study area for designated areas has been extended to include all areas within 200m of the Air Quality ARN (defined in LA 105: Air Quality (Highways England, 2019) and reported in **Section 5.6 of Chapter 5 (Air Quality)** of the **ES (Document Reference 6.1)**.

## 8.6 Baseline conditions

### European Designated Areas

8.6.1 The River Itchen SAC passes under the existing A34 and A33 and lies partially within the Application Boundary.

8.6.2 The River Itchen SAC is designated for its riverine habitats (water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation) and species which it supports including southern damselfly *Coenagrion mercurial*, bullhead *Cottus gobio*, white-clawed crayfish *Austropotamobius pallipes*, brook lamprey *Lampetra planeri*, Atlantic salmon *Salmo salar*, and otter *Lutra lutra*.

8.6.3 Mottisfont Bats SAC lies approximately 16km to the west of the Scheme. This SAC is designated as its woodlands support an important population of the rare barbastelle bat *Barbastella barbastellus*.

8.6.4 These SACs are of **international** nature conservation importance.

8.6.5 The sites within 30km of the Scheme are presented on **Figures 8.1- 8.3** of the **ES (Document Reference 6.2)**.

### Other Statutory Designated Areas

8.6.6 The River Itchen SSSI falls partially within the Application Boundary where the M3, A34 and A33 road bridges cross the River Itchen. The SSSI also forms part of the western boundary of the Scheme. This SSSI is designated due to the complex mosaic of riparian habitats it supports including the chalk stream and associated fen meadow, flood pasture and swamp habitats which support species such as otter, water vole *Arvicola amphibius*, and white-clawed crayfish. Unlike the SAC, the SSSI designation also includes some of the habitats adjacent to the river channel including the historic water meadow habitats.

- 8.6.7 St Catherine's Hill SSSI is located approximately 500m south of the Scheme. This SSSI is designated for chalk grassland and associated habitats.
- 8.6.8 Statutory designated areas noted above are presented on **Figure 8.1 (Statutory Designated Areas – 2km)** of the **ES (Document Reference 6.2)**.
- 8.6.9 The following SSSIs are beyond the 2km study area from the Scheme, but are within 200m of the ARN:
- Cheesefoot Head SSSI - designated for chalk grassland
  - River Test SSSI - designated for chalk stream habitats
  - Highclere Park SSSI - designated for wood pasture and grassland habitats
  - Burghclere Beacon SSSI - designated for chalk grassland
- 8.6.10 These SSSIs are of national nature conservation importance.
- 8.6.11 There are no further statutory designated areas within a 2km study area surrounding the Scheme or within 200m of the ARN.

#### **Non-statutory Designated Areas**

- 8.6.12 There are 26 Sites of Importance for Nature Conservation (SINC) and two Road Verge of Ecological Importance (RVEI) within a 2km radius of the Scheme. Details of these are presented in the **Appendix 8.1y (Desk Study Report)** of the **ES (Document Reference 6.3)**.
- 8.6.13 Easton Down SINC lies partially within the Application Boundary. Grassland within the SINC was designated as it met the SINC selection Criteria "*Grasslands which have become impoverished through inappropriate management, but which retain sufficient elements of relic unimproved grassland to enable recovery*". Grassland within this SINC has been subject to detailed assessment during the botanical surveys undertaken in 2017 as part of the Scheme surveys and was considered to be of limited ecological interest.
- 8.6.14 All other non-statutory designated areas within 2km of the Scheme fall outside the Application Boundary. Four of these sites (The Old Rectory Meadow Easton SINC, Magdalen Down North SINC, Magdalen Down South SINC and Deacon Hill SINC) contain important grassland communities. A31 Petersfield Road, Chilcomb SINC RVEI supports the notable moth species striped lychnis *Shargacucullia lychnitis*, River Itchen Meadow Easton SINC, is designated for important water meadow habitat.
- 8.6.15 The non-statutory designated areas noted above are presented on **Figure 8.4 (Non-Statutory Designated Areas)** of the **ES (Document Reference 6.2)**.
- 8.6.16 Additional non-statutory designated areas (SINC, RVEI, and Local Wildlife Sites (LWS)) have been identified within 200m of the ARN. These are presented

within **Appendix 8.1y (Ecological Desk Study Report)** of the **ES (Document Reference 6.3)**.

8.6.17 All non-statutory designated areas mentioned above are of county nature conservation importance.

8.6.18 In addition to the non-statutory designated areas above, the Winnall Moors Nature Reserve falls within the 2km search area. This reserve managed by the Hampshire and Isle of Wight Wildlife Trust is adjacent to the Scheme outside the Application Boundary. The reserve covers part of the River Itchen SSSI and is assessed alongside the SSSI within this chapter.

### Habitats

8.6.19 The following HPs have been identified within the 2km study area: coastal and floodplain grazing marsh, lowland calcareous grassland, lowland fens, lowland meadows, lowland mixed deciduous woodland, purple moor grass and rush pastures, reedbeds, rivers, hedgerows, wet woodland, and open mosaic habitat on previously developed land (OMH). Of which, only lowland calcareous grassland, lowland mixed deciduous woodland, rivers, hedgerows, and OMH occur within the Application Boundary and are presented on **Figure 8.5 (Habitats of Principal Importance)** of the **ES (Document Reference 6.2)**.

8.6.20 The description of habitats present is based on the 2022 UK Hab survey, with reference to historical survey data. Full reports can be found within **Appendix 8.1** of the **ES (Document Reference 6.3)**.

8.6.21 No parcels of ancient woodland, ancient trees, or veteran trees have been identified within the Application Boundary. A number of parcels of ancient woodland have been identified on the ancient woodland inventory within 2km, the closest being 475m north-west of the Scheme, as presented on **Figure 8.4 (Non-Statutory Designated Areas)** of the **ES (Document Reference 6.2)**. Further parcels of ancient woodland are present beyond the 2km study area, but within 200m of the ARN. Further details of these can be found in **Appendix 8.3 (Assessment of Air Quality Impacts on Biodiversity)** of the **ES (Document Reference 6.3)**.

8.6.22 To the east of the M3, the landscape is dominated by arable farmland, with associated hedgerows and small areas of woodland. The central area between the A34/A33 and the M3 contains a variety of habitats, including grazed semi-improved pastures and several small woodlands of various types. The River Itchen is a chalk river passing north-east to south-west through the north of the Application Boundary and is characterised by a number of interconnected channels associated with the historic water meadow management of the surrounding grasslands.

8.6.23 The south-western part of the study area is characterised by urban development, including industrial and commercial premises. Also of relevance to the habitats within the study area is the route of a historic railway line passing

close to the A34 that is evidenced by cuttings and embankments, largely vegetated with semi-natural broadleaved woodland.

8.6.24 **Table 8.5** provides a condensed summary of the habitats present within the study area and their nature conservation importance. Full descriptions of the baseline conditions are given in habitat reports within **Appendix 8.1z (UK Hab Survey Report 2022)** of the **ES (Document Reference 6.3)**.



Table 8.5: Summary evaluation of habitats present within or adjacent the study area

Habitat	Summary description	Location in relation to the Application Boundary	Nature Conservation Importance	Rationale for Importance
Hedgerows	<p>The study area included a number of hedgerows to the east of the M3, all of which are HPI.</p> <p>Two hedgerows comprising parallel hedgerows along Easton Lane to the east of the M3 were species-rich, supporting a diversity of native woody and herbaceous plant species. Within <b>Chapter 9 (Cultural Heritage)</b> of the <b>ES (Document Reference 6.1)</b>, these hedgerows have been identified as 'important' under the Hedgerow Regulations due to their history, and they are considered likely to also be important on ecological grounds.</p>	Within and adjacent	Local	Hedgerows are a HPI under the NERC Act 2006. Hedgerows are a common habitat in the local area, however many are species-poor and heavily managed. Hedgerows within the Scheme are predominantly species rich, and therefore the hedgerow resource within the scheme is considered to be of importance to the local level.
Lowland calcareous grassland	<p>Calcareous grassland was present on the thin chalk soils adjacent to the M3 Junction 9 roundabout,. These stands of calcareous grassland were dominated by a range of calcicolous forbs, including greater knapweed <i>Centaurea scabiosa</i>, wild basil <i>Clinopodium vulgare</i> and wild</p>	Within	Local	Lowland calcareous grassland is a HPI and a Hampshire Biodiversity Action Plan (BAP) habitat, however the areas of this habitat on the highway verges within the Application Boundary are small and fragmented and are unlikely to meet criteria for selection of SINC's at a county level.



Habitat	Summary description	Location in relation to the Application Boundary	Nature Conservation Importance	Rationale for Importance
	marjoram <i>Origanum vulgare</i> , with abundant pyramidal orchid <i>Anacamptis pyramidalis</i> present around the roundabout.			
Lowland mixed deciduous woodland	Stands of this habitat were found along the River Itchen corridor, both within and adjacent to the Application Boundary. These were dominated by hazel ( <i>Corylus avellana</i> ) coppice stools, with occasional trees.	Within and adjacent	County	The lowland mixed deciduous woodland within the Application Boundary does not form part of the River Itchen SSSI and is not covered by non-statutory designations, however it is likely to provide a supporting function to the SSSI and species which use the River Itchen corridor.
Reedbed	Where the River Itchen flows under the A34 to the north of Winnall Industrial Estate, was a large stand of common reed.	Adjacent	National	This habitat is a qualifying feature of the River Itchen SSSI.
Rivers	The River Itchen is crossed by the Scheme via existing bridges on the A34, A33 and M3. The vegetation of the river and tributaries is typical of chalk streams, with very clear water and abundant aquatic vegetation. In the areas surveyed aquatic vegetation mostly comprised of fool's-watercress <i>Apium nodiflorum</i> and water starworts	Within and adjacent	International	The River Itchen is designated as a SAC, which is of international importance.

Habitat	Summary description	Location in relation to the Application Boundary	Nature Conservation Importance	Rationale for Importance
	<p><i>Callitriche</i> species., and marginal vegetation with tall wetland species such as greater tussock-sedge <i>Carex paniculata</i>.</p> <p>This type of habitat is referable to the Annex I habitat '3260 Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation' and is a qualifying feature of the River Itchen SAC</p>			
Wet woodland	This habitat was present along the River Itchen. Dominated by a canopy of alder <i>Alnus glutinosa</i> and willows <i>Salix</i> spp.	Adjacent	County	Wet woodland is likely to provide a supporting function to the SSSI and species which use the River Itchen Corridor.
Lowland fen / purple moor grass and rush pasture	Adjacent to the Application Boundary, stands of fen habitat were found in unmanaged areas along the River Itchen and other low-lying parts of the SSSI. This habitat comprised wetland tall herb vegetation, dominated by large grasses and sedges, such as common reed <i>Phragmites australis</i> and reed canary-grass <i>Phalaris</i>	Adjacent	National	This habitat is a qualifying feature of the River Itchen SSSI.

Habitat	Summary description	Location in relation to the Application Boundary	Nature Conservation Importance	Rationale for Importance
	<i>arundinacea</i> , with wetland forbs such as common comfrey <i>Symphytum officinale</i> and hemlock water-dropwort <i>Oenanthe crocata</i> .			
Lowland meadows	Adjacent to the Application Boundary, stands of species-rich neutral grassland were present within the River Itchen SSSI. These meadows supported a range of neutral grassland and wetland species, including sedges such as carnation sedge <i>Carex panicea</i> and lesser pond-sedge <i>C. acutiformis</i> , rushes such as blunt-flowered rush <i>Juncus subnodulosus</i> , and forbs such as marsh thistle <i>Cirsium palustre</i> , meadowsweet <i>Filipendula ulmaria</i> , ragged robin <i>Silene flos-cuculi</i> , southern marsh-orchid <i>Dactylorhiza praetermissa</i> and water avens <i>Geum rivale</i> .	Adjacent	National	This habitat is a qualifying feature of the River Itchen SSSI.
Open Mosaic Habitat on Previously	OMH is present within the recycling depot between the M3 and A272. Largely this habitat is outside of the	Within and adjacent	Local	OMH is an HPI. The MAGIC website shows OMH habitat is widely distributed across urban areas of Hampshire. The area of

Habitat	Summary description	Location in relation to the Application Boundary	Nature Conservation Importance	Rationale for Importance
Developed Land (OMH)	<p>Application Boundary, although a small area is present within.</p> <p>This is a habitat disturbed by human activity with colonising vegetation. Species recorded are often associated with disturbed land such as bristly oxtongue <i>Helminthotheca echioides</i> and hemlock <i>Conium maculatum</i>.</p>			OMH within and adjacent the Application Boundary is small and isolated.
Other habitats	<p>Other habitats identified within the Application Boundary which do not constitute HPI include: other neutral grasslands, scrub, other woodlands (including plantation and coniferous woodlands), and cultivated land.</p> <p>It should be noted that arable (cultivated land) and road verges are Local Biodiversity Action Plan habitats due to their inclusion on Biodiversity Action Plan for Hampshire (Hampshire Biodiversity Partnership).</p>	Within	Less than local	Whilst cultivated land and road verges are Local BAP habitats within Hampshire, along with the other habitats in this category they remain very common throughout the local area, and their presence would not elevate the importance above 'less than local'.

## Species

8.6.25 A summary of the baseline information for species and species groups is provided in **Table 8.6**. Baseline survey reports can be found in **Appendix 8.1a-8.1z2** of the **ES (Document Reference 6.3)**.

Table 8.6: Summary of the baseline information for species and species groups.

8.6.26 Survey reports and associated figures can be viewed in **Appendix 8.1a-8.1y** of the **ES (Document Reference 6.3)** (see **Table 8.2** for specific references).

Biodiversity feature	Summary description	Appendices (Document Reference 6.3)	Nature conservation importance and rationale
Badgers	Evidence of badgers has been recorded within and adjacent to the Application Boundary, with one main sett present within the Application Boundary.	8.1a, 8.1u, and 8.1p	<p><b>Less than local</b></p> <p>Badgers are widespread and common throughout lowland Britain and the local area.</p>
Bats (foraging and commuting)	<p>Records of eleven bat species within 5km of the Application Boundary have been received during the desk study which consist of: brown long-eared bat (<i>Plecotus auritus</i>), common pipistrelle (<i>Pipistrellus pipistrellus</i>), Daubenton's bat (<i>Myotis daubentonii</i>), greater horseshoe bat (<i>Rhinolophus ferrumequinum</i>), lesser noctule (<i>Nyctalus leisleri</i>), Natterer's bat (<i>Myotis nattereri</i>), noctule bat (<i>Nyctalus noctula</i>), serotine (<i>Eptesicus serotinus</i>), soprano pipistrelle (<i>Pipistrellus pygmaeus</i>), western barbastelle (<i>Barbastella barbastellus</i>), whiskered/Brandt's bat (<i>Myotis mystacinus/ Myotis brandtii</i>).</p> <p>The use of land within the Application Boundary by foraging and commuting bats is limited by the presence of the highway infrastructure which would displace bats due to reduced foraging resource and other effects from lighting and disturbance. However marginal habitats such as woodland, hedgerows and grassland would provide suitable resources.</p> <p>Bat activity surveys have established that habitats within the Application Boundary are used by a range of species, predominantly common species, although rarer species do occur on occasion. Species recorded include:</p>	8.1b, 8.1r, 8.1s	<p><b>County</b></p> <p>Bat activity was highest along the River Itchen corridor, and this landscape feature provides optimum foraging and commuting habitat. Other habitats within the study area were of lower suitability albeit with some localised areas of interest. The majority of bats recorded were common species, although smaller numbers</p>

Biodiversity feature	Summary description	Appendices (Document Reference 6.3)	Nature conservation importance and rationale
	<p>common pipistrelle, soprano pipistrelle, barbastelle, brown long-eared, greater horseshoe, noctule, serotine, Natterer's bat, Leisler's bat, and Nathusius' pipistrelle.</p> <p>Bat activity surveys did not record pronounced concentrations of activity in any one location, although higher levels of activity were noted along the River Itchen corridor, which is unsurprising given the mixture of wetland and woodland habitats along the River Itchen, providing optimal habitat for foraging and commuting bats.</p> <p>In 2017, elevated levels of bat activity were recorded within the narrow fields between the M3 and the A34. This was considered likely to be associated with bats using the adjacent River Itchen corridor. However, given the isolation of these habitats and high background light levels, this area was considered unlikely to be of particular importance for bats. Further bat activity and bat trapping survey work during 2020 and 2021 confirmed that this area is not used by high numbers of bats and higher levels of bat activity in this area may be sporadically encountered.</p>		<p>of rare or uncommon species were recorded.</p>
Bats (roosting)	<p>Trees and structures (bridges) with potential to support roosting bats occur within the Application Boundary.</p> <p>Detailed emergence/re-entry surveys of Kingsworthy Bridge and Itchen Bridge did not reveal any evidence of roosting bats. However, the use of the bridges as a roosting resource on an occasional basis cannot be entirely ruled out.</p> <p>Tree climbing and inspection surveys of trees with bat suitability did not identify any roosting bats or evidence of roosting.</p>	8.1i, 8.1r, 8.1s	<p><b>Less than local</b></p> <p>Whilst no bat roosts have been identified within the Application Boundary, the use of features within the site on an occasional basis such as bridges or trees, cannot be ruled out. However, if roosts are present, current</p>



Biodiversity feature	Summary description	Appendices (Document Reference 6.3)	Nature conservation importance and rationale
			evidence would suggest these are likely to be only occasionally used roosts by common species of bats.
Hazel dormouse	The desk study and 2017 field survey identified multiple records of dormouse within the study area. Habitat assessment undertaken in 2020 did not identify significant changes to habitats, and therefore along with the largely sedentary nature of this species, the existing survey data is considered sufficient to inform this assessment. Dormice are considered to be present within all suitable habitat within the Application Boundary.	8.1f	<p><b>Local</b></p> <p>Dormice are present within suitable woodland scrub and hedgerow habitat within the Application Boundary and adjacent habitats. Whilst dormouse are distributed across southern England, they live at low densities and are becoming increasingly scarce due to habitat fragmentation. They are widespread in Hampshire (McFadyen, 2004) and so would not meet the threshold for 'county' importance, but their general scarcity makes them of</p>

Biodiversity feature	Summary description	Appendices (Document Reference 6.3)	Nature conservation importance and rationale
			importance at the local level.
Otter	<p>The desk study identified 42 otter records within a 2km search radius, including locations within the Application Boundary. The population of otter within the River Itchen as a whole are a qualifying feature of the River Itchen SAC and SSSI. The study area offers suitable food resources (fish within the River Itchen), hydrological connectivity and vegetative cover such as dense reedbed, scrub and areas of deciduous woodland.</p> <p>Field surveys have confirmed otter presence on the River Itchen within and adjacent to the Application Boundary. No otter resting places were identified within the Application Boundary, although they have been identified in adjacent habitats approximately 50m from the Application Boundary.</p> <p>The majority of the habitats associated with the River Itchen system, including wet woodland and fen meadows were considered suitable for otter foraging, resting, commuting and breeding purposes. However, no confirmed evidence of otter was identified during survey of terrestrial habitats within the Application Boundary.</p>	8.1g, 8.1n, 8.1x	<p><b>County</b></p> <p>Whilst otter have become more widespread in recent decades, they are still relatively scarce, and the optimum habitats within the River Itchen corridor are likely to be of high importance to otter.</p> <p>Otter is a qualifying feature, but not a primary reason for selection, of the River Itchen SAC.</p> <p>The study area is likely to support only a small number of otter given their wide-ranging behaviour and their relatively large territory size.</p>

Biodiversity feature	Summary description	Appendices (Document Reference 6.3)	Nature conservation importance and rationale
Water vole	<p>The desk study identified 445 water vole records within a 2km radius of the Application Boundary.</p> <p>Presence of water vole has been confirmed in habitats west of the Application Boundary. However, surveys found no evidence of water voles within the extent of the Application Boundary, and reported that the riparian woodland habitats along the River Itchen corridor within the Application Boundary were of limited suitability for water vole due to shading and lack of bankside vegetation.</p> <p>This species is considered likely to be absent from the Application Boundary other than occasional commuting along the River Itchen.</p>	8.1l and 8.1t	<p><b>County</b></p> <p>Despite declines, this species is still relatively widespread in Britain, and would therefore not be considered of national value. The river Itchen is a stronghold for this species in Hampshire, and therefore water vole is considered of county importance.</p>
Other Species of Principal Importance (SPI)	<p>The desk study identified records of hedgehog, brown hare, harvest mouse and polecat within a 2km search radius of the Application Boundary.</p> <p>Habitat surveys have confirmed the presence of suitable habitat for these species within the Application Boundary.</p>	8.1c, 8.1h, 8.1m, 8.1p, 8.1y	<p><b>Less than local</b></p> <p>Whilst notable, these species are widespread in suitable habitat across much of lowland Britain, Hampshire and the local area.</p>

Biodiversity feature	Summary description	Appendices (Document Reference 6.3)	Nature conservation importance and rationale
Breeding birds	<p>The desk study highlighted a number of notable bird species records within a 2km radius of the Application Boundary. This included a number of species listed under Schedule 1 of the WCA 1981, offering them elevated legal protection when breeding. Of these, kingfisher <i>Alcedo atthis</i>, has potential to breed within or near to the Application Boundary along the River Itchen corridor. Other schedule 1 species for which records were received, including black-tailed godwit <i>Limosa limosa</i> and black redstart <i>Phoenicurus ochruros</i> were either outside their typical breeding range, or suitable breeding habitat is not present, and therefore would not breed within or near to the Application Boundary.</p> <p>Field surveys established that the habitats within and surrounding the Application Boundary support a breeding bird assemblage likely to include at least two declining farmland SPI as listed under the NERCA 2006, skylark <i>Alauda arvensis</i> and yellowhammer <i>Emberiza citrinella</i>. Due to the intensively farmed nature of the arable habitats, and the limited number of registrations of these species, it is likely that only small populations are present within or adjacent to the Application Boundary. Two Schedule 1 species of the WCA 1981, Cetti's warbler <i>Cettia cetti</i> and kingfisher, were recorded along the River Itchen west of the A34 (outside the Application Boundary).</p> <p>An incidental sighting of a dead barn owl <i>Tyto alba</i> was made during the reptile surveys on 26/06/2017, located on the southbound M3, indicating this species is present in the local area. This species typically forages over farmland and wetland habitats and may use habitats within the Application Boundary for foraging.</p>	8.1d	<p><b>Local</b></p> <p>The surveys recorded some notable farmland species such as skylark and yellowhammer, within arable farmland habitats. Whilst these species are widespread in suitable habitat in Hampshire, their reliance on specific farmland habitats would make them of importance at a local level.</p>

Biodiversity feature	Summary description	Appendices (Document Reference 6.3)	Nature conservation importance and rationale
Wintering birds	<p>Records of bird species were received which could use habitats within the Application Boundary during winter such as lapwing <i>Vanellus vanellus</i>, redwing <i>Turdus iliacus</i> and starling <i>Sturnus vulgaris</i>.</p> <p>The River Itchen corridor supports a more notable bird community than other habitats, especially where it passes through Winnall Moors Nature Reserve. During the winter bird survey, 63 species were recorded, among them, four species listed under Schedule 1: common kingfisher, Cetti's warbler, red kite <i>Milvus milvus</i>, and redwing <i>Turdus iliacus</i>. Twelve additional species recorded during the surveys are featured in the RSPBs Birds of Conservation Concern Amber list and eleven in the Red list. A further seven species considered as SPI were also recorded.</p>		<p><b>Local</b></p> <p>Whilst some notable species were recorded, they are notable due to their declining breeding populations. However, these are all common and widespread during winter.</p> <p>The assemblages of wintering birds recorded within the study area were considered to be typical of the mix of riparian and agricultural habitats within the local area.</p>

Biodiversity feature	Summary description	Appendices (Document Reference 6.3)	Nature conservation importance and rationale
Reptiles	<p>The desk study identified three species of reptiles within a 2km radius, slow worm <i>Anguis fragilis</i>, grass snake <i>Natrix natrix</i>, and common lizard <i>Zootoca vivipara</i>.</p> <p>Field surveys in 2017 recorded two species of reptile within the Application Boundary; slow worm and common lizard. Reptile populations were associated with road verge grasslands and field margins, and populations within the Application Boundary varied from 'exceptional' to 'low'.</p> <p>Habitat assessment undertaken in 2020 did not identify significant changes to habitats and value to reptiles, and therefore the existing survey data is considered sufficient to inform this assessment.</p>	8.1j	<p><b>Local</b></p> <p>Whilst both common lizard and slow worm are common species, the presence of exceptional populations indicates an importance at a local level.</p>
Amphibians (including great crested newt)	<p>The desk study identified the presence of common toad <i>Bufo bufo</i> within 2km Application Boundary.</p> <p>A number of waterbodies are present within and adjacent to the Application Boundary. Environmental DNA (eDNA) surveys for great crested newt undertaken between 2017 and 2021 all returned negative results for this species. As such, great crested newt is considered to be absent from the Application Boundary and its surrounding area.</p> <p>Common toad <i>Bufo bufo</i> (a SPI) and common frog <i>Rana temporaria</i> have been incidentally recorded on several occasions, associated with the flood meadow habitats adjacent to the River Itchen outside the Application Boundary. Neither common toad or common frog has been recorded within the Application Boundary, and terrestrial habitats within the site are typically of negligible or low suitability for these species.</p>	8.1e, 8.1v	N/A

Biodiversity feature	Summary description	Appendices (Document Reference 6.3)	Nature conservation importance and rationale
	<p>Given great crested newt have not been recorded, and common toad has only been recorded outside the Application Boundary, amphibians are not considered further within this assessment.</p>		
Freshwater fish	<p>The River Itchen is known to support notable species including bullhead <i>Cottus gobio</i>, Atlantic salmon <i>Salmo salar</i> and brook lamprey <i>Lampetra planeri</i>. Brook lamprey are also known to be present throughout the River Itchen catchment where optimal habitats are present. Salmon would utilise optimal habitats within the main stem of the river and adjacent tributaries where water quality and barriers to migration allow. Salmon have been reported in the River Itchen around the existing road crossings and are expected to move through this reach during migration periods to upstream spawning areas.</p> <p>Other species recorded in this section of the River Itchen include brown trout <i>Salmo trutta</i>, grayling <i>Thymallus thymallus</i>, roach <i>Rutilus rutilus</i> and European eels <i>Anguilla anguilla</i>. It is likely that the River Itchen supports a diverse fish community as fish are classified at High quality under the Water Framework Directive, indicating a community demonstrating no, or very minor, deviation from reference condition.</p>	8.1y	<p><b>County</b></p> <p>The River Itchen is known to support notable species including bullhead, Atlantic salmon, and brook lamprey.</p> <p>These fish species are qualifying features of the River Itchen SAC, although population within the study area only forms a small part of this wider population.</p> <p>The diverse assemblage of fish species within the study area is considered</p>



Biodiversity feature	Summary description	Appendices (Document Reference 6.3)	Nature conservation importance and rationale
			to be of importance at a county level.
Terrestrial invertebrates	<p>The desk study identified 2000 records notable invertebrate species records within a 2km search radius. The majority of these records are from the Lepidoptera family (butterflies and moths).</p> <p>The 2017 walkover survey identified areas of high potential for important invertebrate assemblages. Further surveys during 2020 identified twelve notable species largely associated with the flower-rich grasslands within the motorway roundabout, and to the east of the motorway roundabout. The notable species recorded include those that are 'nationally scarce', 'local', SPI, or Hampshire BAP species.</p>	8.1k, 8.1o	<p><b>Local</b></p> <p>Surveys during 2020 have identified twelve notable species largely associated with the flower rich grasslands within the motorway roundabout, and to the east of the motorway roundabout.</p>
Aquatic invertebrates	<p>Two records of southern damselfly were received, both approximately 500m southwest of the Application Boundary. In addition, an anecdotal record of southern damselfly in 2021 was received from the Environment Agency to the northeast of the Application Boundary.</p> <p>Field surveys for suitable southern damselfly habitat undertaken in 2020 following methods set out in Thompson <i>et al.</i> (2003) have confirmed that habitats within and adjacent to the Application Boundary are sub-optimal for southern damselfly and unlikely to support this species.</p> <p>Until recently white-clawed crayfish were considered absent from this stretch of the River Itchen following an outbreak of crayfish plague in the 1990s. However, on the 18 January 2022 approximately 20 individual white-clawed crayfish were recorded in a small watercourse within Winnall Moors Nature Reserve approximately 100m west of the Scheme<sup>3</sup>. Surveys</p>	8.1n, 8.1o, and 8.1z2	<p><b>County</b></p> <p>Due to the habitats present within the River Itchen and adjacent areas, the study area is likely to support a diverse aquatic invertebrate community.</p> <p>White-clawed crayfish, a qualifying species of the River Itchen SAC (but not a primary reason for site selection) are present</p>

<sup>3</sup> Hampshire and Isle of White Wildlife Trust, pers comm.

Biodiversity feature	Summary description	Appendices (Document Reference 6.3)	Nature conservation importance and rationale
	<p>undertaken for the Scheme on the 7 September 2022 also confirmed the presence of white-clawed crayfish within this watercourse in Winnall Moors Nature Reserve.</p> <p>The watercourse where the white-clawed crayfish were found is hydrologically connected to the River Itchen. No white-clawed crayfish were recorded during surveys of the stretch of the River Itchen within the Application Boundary in September 2022. However, it can be difficult to detect low density crayfish populations on large rivers so therefore the presence of this species within the Application Boundary cannot be entirely ruled out. In addition, white-clawed crayfish could colonise this stretch of the River Itchen in the future, given its connectivity with known white-clawed crayfish habitat.</p> <p>It is likely that the River Itchen supports a diverse aquatic invertebrate community as aquatic invertebrates are classified at High quality under the Water Framework Directive, indicating a community demonstrating no, or very minor, deviation from reference condition.</p>		<p>adjacent to the Scheme. Southern damselfly is unlikely to be present within this section of the river, although may be present nearby.</p>
Notable Plants	<p>Eight species of orchid have been recorded within Application Boundary: bee orchid <i>Ophrys apifera</i>, broad-leaved helleborine <i>Epipactis helleborine</i>, chalk fragrant orchid <i>Gymnadenia conopsea</i>, greater butterfly orchid <i>Platanthera chlorantha</i>, pyramidal orchid <i>Anacamptis pyramidalis</i>, southern marsh orchid <i>Dactylorhiza praetermissa</i>, twayblade <i>Listera ovata</i>, and white helleborine <i>Cephalanthera damasonium</i>. White helleborine is a SPI for the conservation of biodiversity. The other orchid species have no legal status.</p>	8.1c, 8.1h, 8.1m, 8.1p	<p><b>Local</b></p> <p>White helleborine is widely distributed across southern England, and remains plentiful in suitable habitats<sup>4</sup>.</p> <p>A number of other notable plant species have been</p>

Biodiversity feature	Summary description	Appendices (Document Reference 6.3)	Nature conservation importance and rationale
	<p>Five species listed on the red list of vascular plants for England were recorded, including: dwarf spurge <i>Euphorbia exigua</i>, field scabious <i>Knautia arvensis</i>, sainfoin <i>Onobrychis viciifolia</i>, stinking chamomile <i>Anthemis cotula</i>, and wild strawberry <i>Fragaria vesca</i>.</p> <p>Six invasive non-native species have been recorded, including: Japanese knotweed <i>Fallopia japonica</i>, giant bramble <i>Rubus armeniacus</i>, goat's-rue <i>Galega officinalis</i>, Himalayan cotoneaster <i>Cotoneaster simonsii</i>, Michaelmas daisy <i>Aster sp.</i>, red-osier dogwood <i>Cornus sericea</i>, and wall cotoneaster <i>Cotoneaster horizontalis</i>. Of these the Japanese knotweed, Himalayan and wall cotoneaster are listed on Schedule 9 of the WCA 1981 making it an offence to plant or otherwise cause to grow in the wild these species.</p>		<p>recorded within the Application Boundary. Whilst notable, an assemblage of species such as these is likely to be typical in suitable habitat in Hampshire.</p>

## Baseline evolution

- 8.6.27 The baseline provided in the above sections describes the biodiversity features as they were in the years surveyed (2017-2022). The following describes the anticipated future biodiversity baseline at the assumed start date of construction (2024).
- 8.6.28 The majority of the land within the Application Boundary is existing highway infrastructure or adjacent agricultural land. As such the biodiversity baseline is unlikely to change significantly as these habitats are likely to be managed in a similar fashion into the future or are wholly artificial habitats.
- 8.6.29 **Appendix 15.1 (Long list of Cumulative Developments)** of the **ES (Document Reference 6.3)** provides a full list of schemes which have been identified as being likely to be in operation prior to the construction of the Scheme. These schemes form part of the future baseline scenario and have been taken into account in the assessment of likely significant effects from the Scheme (construction and operation) presented in this chapter.

## 8.7 Potential impacts

- 8.7.1 The Scheme has the potential for a range of impacts on important biodiversity features. As set out in Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018), impacts can be either direct or indirect:
- A direct impact is considered to be a direct/ immediate consequence of the Scheme, or particular activity, without any intervening steps. In this instance this is a physical loss or gain of a habitat, or direct mortality/ damage of an individual, or species population
  - An indirect impact is considered to be an impact on one individual, population, or habitat arising from an impact on an intermediary or as a result of an impact pathway
- 8.7.2 The characteristics of these impacts are discussed in relation to important biodiversity features (identified within **Section 8.7**) in **Section 8.9**.

### Construction (including site preparation)

- 8.7.3 The majority of potential impacts would arise during the construction phase. The potential impacts associated with construction are based on the construction phase lasting approximately three years. The potential impacts of the Scheme that are likely to relate to important biodiversity features are:
- **Habitat loss or gain:** These are direct impacts related to the change in land use resulting from the Scheme. This would include loss of habitats (including HPI) through vegetation clearance required to facilitate construction activities, change in land use such as the creation of drainage ponds, habitat creation and enhancement (as shown on **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)**)

- **Fragmentation of populations or habitats:** Indirect impacts due to breaking up of a habitat, ecosystem, or land-use type into smaller parcels, or the creation of partial or complete barriers to the movement of species such as bats and dormice, with a consequent impairment of ecological function
- **Disturbance:** An indirect impact resulting from a change in normal conditions (light, noise, vibration, human activity) that would result in the important biodiversity feature, such as fish or otter, changing its typical behaviour
- **Habitat degradation:** A direct or indirect impact resulting in quality of the habitat or the reduction in the suitability of the habitat for the identified important receptor. For instance, the impact of shading or changes in water quality to the River Itchen and the species which it supports
- **Species mortality:** A direct impact on a population of a species associated with mortalities due to construction activities

## Operation

8.7.4 The operational phase of the Scheme is considered to be when the Scheme becomes active; as such, the potential impacts are associated with the activity of vehicles using the Scheme itself, along with other operational requirements such as habitat management. The potential impacts of the Scheme during the operational phase that are likely to relate to important biodiversity features are:

- **Species mortality:** A direct impact on a population of a species associated with mortalities from collisions with vehicles (such as badger), possible pollution incidents (such as freshwater fish) and management practices
- **Habitat degradation:** An indirect impact resulting in reduction of the suitability of the habitat following construction for the identified important biodiversity features. Generally associated with increased light, noise, vibration and chemical pollution. For instance, increases in pollutants from exhaust emissions could result in degradation of habitats adjacent to the road network
- **Fragmentation:** An indirect impact resulting in fragmentation of populations of important biodiversity features such as bats, that are specifically associated with the operational phase, such as light spill associated with active vehicles
- **Disturbance:** An indirect impact resulting from a change in normal conditions that would result in the important biodiversity feature changing its typical behaviour. For instance, changes in operational noise levels which could affect otters using the River Itchen corridor

## 8.8 Design, mitigation and enhancement measures

- 8.8.1 Mitigation measures incorporated into the design of the Scheme are reported as embedded mitigation in **Chapter 4 (Environmental Assessment Methodology)** of the **ES (Document Reference 6.1)**; those relevant to biodiversity are included below. This section also outlines essential mitigation required. Essential mitigation is outlined within the **fiEMP (Document Reference 7.3)**. Prior to the implementation of mitigation, the Scheme has the potential to have adverse biodiversity impacts during construction and operation.
- 8.8.2 The mitigation hierarchy has been embedded within the assessment process, whereby the design has sought to avoid adverse impacts in the first instance through an iterative approach to design, e.g. informing alignment to avoid sensitive receptors where possible (see **Chapter 3 (Assessment of Alternatives)** of the **ES (Document Reference 6.1)**). In areas where avoidance is not possible, measures have been included to prevent or reduce potentially significant negative effects. As a last resort, measures to compensate negative effects have also been included, e.g. habitat creation to offset impacts associated with habitat loss and fragmentation where these cannot be avoided.
- 8.8.3 The Scheme incorporates measures that have been embedded into the design to mitigate adverse effects on important biodiversity features and compensate for the loss of habitats by the creation of new areas of habitat within the Scheme. It also includes working practices which would avoid impacts and provide mitigation for important biodiversity features during construction and operation. These measures have been identified and developed through the assessment process, including consultation with stakeholders and statutory bodies.

### Embedded mitigation

#### *Construction (including site preparation)*

- 8.8.4 The current design has been subject to review and options appraisal to enable potential effects to important biodiversity receptors to be avoided where possible. This has resulted in:
- The chosen route of the western walking route (see **Chapter 3 (Assessment of Alternatives)** of the **ES (Document Reference 6.1)**) being located wholly outside the River Itchen SAC and SSSI, other than the proposed new foot/cycle bridge which spans these designated areas
  - The proposed new foot/cycle bridge over the River Itchen SAC/SSSI would be a clear span structure, with no piers within the river channel. In addition, the abutments would be set back from the riverbank, outside of the SAC and SSSI



## *Operation*

- 8.8.5 The operational drainage system has been designed to modern highway standards and is likely to provide an improvement of water treatment compared to the existing situation. The drainage design includes a range of features to treat highway runoff including wetlands, attenuation basins, and swales. The drainage strategy is set out **Appendix 13.1 (Drainage Strategy Report)** of the **ES (Document Reference 6.3)**.
- 8.8.6 The design of the new foot/cycle bridge, with abutments set back from the River Itchen would allow passage of wildlife, in particular otter, to be maintained along the riverbank during operation. The bridge deck also follows the same horizontal alignment as the existing adjacent road bridges (Itchen Bridge and Kingsworthy Bridge), to make certain it does not present an additional blockage to animals such as bats commuting along the River Itchen.
- 8.8.7 New areas of woodland and scrub within the landscape design have been located to maintain and enhance connectivity for wildlife (including bats and dormice) within the Scheme and wider landscape during operation. Much of the additional woodland and scrub planting is adjacent to existing woodlands, or provides habitat links, which would enhance their ecological function (refer to **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)**).
- 8.8.8 The provision of substantial areas of chalk grassland, woodland and scrub along the eastern boundary of the Scheme would improve connectivity for wildlife in a north-south direction (refer to **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)**).
- 8.8.9 Fencing would be provided along the footpath/cycleway either side of the River Itchen to prevent pedestrians from entering woodland habitat potentially used by otter (although no otter signs were recorded during a specific survey of this woodland).
- 8.8.10 To avoid or minimise the risk of badgers and otters colliding with vehicles during operation, wildlife fencing would be provided in key locations as part of the Scheme. This has been located to avoid mammals crossing onto the highway network from adjacent areas, and to direct animals to alternative suitable habitat. One way return gates would also be provided through the fence to allow animals to exit the highway network.
- 8.8.11 Lighting has only been incorporated into the design of the Scheme within subways, underpasses, and at two gantries over the M3 south of junction 9, where it is essential for safety reasons. There would be no lighting elsewhere within the Scheme.



## Essential mitigation

### Construction (including site preparation)

8.8.12 **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)** illustrates the proposed landscape design. The design includes habitats of ecological value which are appropriate to the local area, including chalk grassland, species rich grassland (with chalk grassland characteristics), and woodland, with the aim of maximising biodiversity outputs from the Scheme in accordance with National Highways performance targets. Stakeholders including South Downs National Park Authority have been consulted on the design of the habitat compensation and enhancement package to make certain it is appropriate to the surrounding landscape and habitats, and future climatic conditions. The design of the habitat creation package draws on the successes of other mitigation schemes designed for highways in the local area<sup>5</sup>. The habitat creation package can be viewed on **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)**, with further details provided in **Appendix 7.6 (Outline Landscape and Ecological Management Plan)** of the **ES (Document Reference 6.3)**. Habitats to be created and restored would include:

- Areas of chalk grassland to the east of the M3. Grassland to be created using suitable seed mixes of local provenance. Chalk grassland would be created over exposed chalk substrate, or chalk that has been liberated during construction work, with little or no topsoil to enable a nutrient-poor substrate suitable for chalk grassland. The habitat creation would also provide connectivity between existing areas of chalk grassland in the wider landscape
- The creation of new areas of chalk grassland would provide habitats for a range of species including priority species of invertebrates and birds. As discussed during consultation with Butterfly Conservation, the seed mix used would include dark mullein *Verbascum nigrum*, the larval foodplant of the striped lychnis moth (a SPI and Local BAP species with very restricted national distribution). This species is known to be present on the A31 Petersfield Road, Chilcomb SINC (adjacent to the Scheme), and therefore should readily likely colonise new habitats within the Scheme assuming the correct foodplant is present. In addition, the seed mix would include kidney vetch *Anthyllis vulneraria* and horseshoe vetch *Hippocrepis comosa*, the foodplants of small blue (a SPI), Adonis blue and chalkhill blue butterflies.
- The creation of species rich grasslands on the highway cuttings and embankments elsewhere on the Scheme. These grassland areas will be low nutrient, with little or no topsoil, to ensure a diverse sward develops. Whilst unlikely to be true chalk grasslands like those proposed to the east of the

<sup>5</sup> Case Study: Dorset's Natural Influence at its best. Biodiversity net gains from the Weymouth Relief Road construction. (Dorset Local Nature Partnership)

M3, due to the underlying geology these species rich grasslands are likely to have characteristics of chalk grassland.

- A number of areas of native broadleaved woodland and native scrub, both on the highway estate and within adjacent farmland. Woodland and scrub has been located to maintain and enhance connectivity for wildlife (including bats and dormice) within the Application Boundary and adjacent landscape
- Species-rich grassland in farmland in the north of the Scheme to the west of the M3. Grassland is to be enhanced through a combination of overseeding and favourable management
- A mosaic of native scrub and natural regeneration would be created along a stretch of the redundant A34 between the M3J9 gyratory and the River Itchen crossing
- Where hedgerows cannot be retained, either during construction or following landscaping activities, these would be replaced or translocated where possible. This includes section of the hedgerow running alongside Easton Lane
- Whilst noting their primary function is for attenuation and treatment of surface water, some of the drainage features including wetlands and swales would provide semi-natural habitats of value to biodiversity

8.8.13 The redundant section of the A34 northwest of Junction 9 gyratory would be broken up and planted with native scrub and chalk grassland to provide habitat for wildlife such as hazel dormice, breeding birds and invertebrates.

8.8.14 Essential mitigation measures are outlined in the **fiEMP (Document Reference 7.3)**, in accordance with LA 120 Environmental management plans (Standards for Highways, 2020). As the design develops towards the construction phase, mitigation would be refined and included within the second iteration Environmental Management Plan (siEMP), which would be secured through a Development Consent Order (DCO) requirement. The EMPs would be drafted in consultation with statutory bodies, and regular contact would be had with these parties through the subsequent detailed design and delivery (construction) phases.

8.8.15 A comprehensive package of pollution prevention measures would be provided to avoid accidental pollution events during construction, with particular regard to the River Itchen. Measures would include source control, settlement tanks, silt fencing, and dust suppression.

8.8.16 Works near watercourses would be carried out in accordance with Construction Industry Research and Information Association (CIRIA) guidance, in particular *C532 Control of water pollution from construction sites*, *C650 Environmental Good Practice on Site*, and *CIRIA C648 Control of water pollution from linear construction projects* (detailed within the **fiEMP (Document Reference 7.3)**). This includes selecting appropriate probability rainfall events (10-year return

period) and overspill contingencies. Due to the sensitivity of the receptors, Factors of Safety would be incorporated, to be agreed with the regulatory bodies (Lead Local Flood Authority (LLFA) and the Environment Agency).

- 8.8.17 Fencing of adjacent designated areas and retained important habitat to protect the area/habitat would be installed to avoid accidental damage and avoid incidental species mortality. Easton Down SINC is located within the Application Boundary but would be fenced and protected throughout the construction phase.
- 8.8.18 Measures would be provided to avoid entrapment of animals during construction, such as covering excavations at night or where this is not feasible providing escape ramps.
- 8.8.19 Habitat clearance has been programmed to avoid sensitive periods for fauna such as breeding birds (including species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)), dormice, roosting bats and badgers. Where this is not possible, for instance if vegetation clearance is required during the bird breeding season, any vegetation would be checked by an ecologist prior to clearance to make certain no active nests are present. If active nests are found, vegetation clearance would be postponed until all birds have fledged and the nests are no longer in use.
- 8.8.20 Prior to construction, a Reptile Mitigation Strategy would be produced and implemented to allow reptiles to be safeguarded throughout the construction and operational phases. This strategy would include trapping and translocation of reptiles, as well as habitat manipulation and displacement of reptiles (this method has been successfully utilised on road schemes in the region and was supported by Natural England<sup>6</sup>). Prior to translocation, receptor sites would be enhanced to increase their carrying capacity for reptiles through creating mosaics of habitats including scrub, grassland and open areas; and creating reptile refuges and hibernacula. Receptor sites would be within National Highway landholding, or with the agreement of landowner, and would be managed in the long term to maintain suitability for reptiles.
- 8.8.21 Construction of the Scheme would adhere to guidance issued by the Environment Agency on working methods and timing restrictions in relation to avoiding impacts to fish within the River Itchen, including the qualifying species of the River Itchen SAC/SSSI. In-river working required for installation of drainage outflows would avoid sensitive periods (1 October to 31 May inclusive for salmonid fish, and 15 March to 1<sup>st</sup> June inclusive for cyprinid fish). Where dewatering of sections of the river is required to facilitate construction, fish would be removed from these areas using electrofishing, in agreement with the Environment Agency and under any necessary permits. Piling works required for the construction of the new foot/cycle bridge would be carried out using low vibration methods or would adhere to the timing restrictions detailed above.

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<sup>6</sup> Case study: A338 Major Maintenance Scheme A new approach for ensuring road schemes avoid harm to reptiles, including European Protected Species (EPS), while securing significant wildlife gains (Natural England, Dorset County Council)

- 8.8.22 To avoid risk to white-clawed crayfish and other aquatic species from introduction of non-native species or pathogens, biosecurity measures would be implemented when carrying out works within the watercourses. This would include disinfecting all equipment, personal protective equipment (PPE), and machinery with a broad-spectrum disinfectant. This treatment would be repeated whenever machinery, equipment or PPE is transferred to another site or watercourse. No in-river working activities to the river channel or its banks would be undertaken without prior checks for white-clawed crayfish. If found to be present within the working area, white-clawed crayfish would be moved to an adjacent (unaffected) section of the River Itchen. If required, a licence would be obtained for the works. The timing of in-river works would be scheduled between 1 July and 30 September to avoid the sensitive period for white-clawed crayfish.
- 8.8.23 Where practicable, construction phase lighting would be designed to reduce light spill on important light-sensitive important biodiversity features, in particular the River Itchen corridor which is known to support bats and otters. Measures would also include reference to measures in Section 10.4 (Temporary Floodlighting) of *Dark Skies Technical Advice Note 2*, (South Downs National Park, May 2021), this is noted in the **fiEMP (Document Reference 7.3)**.
- 8.8.24 To compensate for the loss of a main badger sett, an artificial badger sett would be provided. A licence under the Protection of Badgers Act 1992 would be obtained to legally allow closure of the existing sett and would include full details of appropriate mitigation strategies. All works affecting badgers shall be undertaken in accordance with the licencing requirements, and standing advice from Natural England. To compensate for the loss of the main sett, an artificial sett would be constructed and retained in perpetuity. The artificial sett would be located within the Application Boundary as close as possible to the existing main sett, but to avoid disturbance would be outside the area of main works and temporary works. Other setts identified within the Application Boundary would be retained and protected during the construction phase.
- 8.8.25 To compensate for the loss of hazel dormice habitat (woodland, scrub and hedgerow) within the Application Boundary, the landscape planting has provided compensatory planting to enable a net increase in dormouse habitat within the Application Boundary in the long term, and to maintain connectivity across the wider landscape. A European Protected Species licence would be obtained to legally allow clearance of dormouse habitat. The licence would require full details of appropriate mitigation strategies.
- 8.8.26 The **fiEMP (Document Reference 7.3)** includes measures to prevent the spread of non-native invasive species present within the Application Boundary and commits to the preparation of an Invasive Species Management Plan to be drafted prior to construction commencing.
- 8.8.27 An Ecological Clerk of Works (ECoW) would be present on site during key periods of the construction phase. The ECoW would be required to make certain that all committed mitigation measures are adhered to.

8.8.28 Due to the mobility of species and potential for changes in habitats, to make certain the ecological baseline is up-to-date and suitable to inform the **fiEMP (Document Reference 7.3)** and the discharge of Requirements, baseline ecological surveys would be updated prior to construction. The surveys would include, but are not limited to the following:

- Updated habitat and notable plant survey
- Updated bat roost surveys of all trees and buildings affected during construction
- Updated badger survey
- Updated dormice survey
- Updated otter survey
- Updated invasive species survey
- Updated reptile survey
- White-clawed crayfish surveys

8.8.29 Information on new species or change in distribution of existing species may require further surveys to be undertaken.

### **Operation**

8.8.30 During operation of the Scheme, essential mitigation in relation to important biodiversity receptors would include the management and monitoring of habitat creation and enhancement measures. Further details are provided within **Appendix 7.6 (Outline Landscape and Ecological Management Plan)** of the **ES (Document Reference 6.3)**, with a full Landscape and Ecological Management Plan (LEMP) secured through a DCO Requirement in consultation with statutory consultees.

8.8.31 Monitoring of the badger and dormice populations is necessary as part of the licencing requirements and would be agreed with Natural England.

### **Enhancements**

8.8.32 The Scheme includes provision of a road drainage scheme that would capture pollutants within road runoff and remove pollutants before the treated runoff is discharged. The scheme would provide a betterment on the existing road drainage system and improve the quality of water discharged into the River Itchen. The drainage strategy is set out in **Appendix 13.1 (Drainage Strategy Report)** of the **ES (Document Reference 6.3)**.

8.8.33 Habitat provision set out on **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)** would enhance connectivity for wildlife within the Scheme. New areas of woodland and scrub towards the north of the Scheme,



mostly located adjacent to existing habitats, would enhance connectivity for bats and dormice and other wildlife. The provision of substantial areas of chalk grassland, woodland and scrub along the eastern boundary of the Scheme would improve connectivity for a range of wildlife including bats, dormice, and terrestrial invertebrates in a north-south direction.

8.8.34 In areas of retained woodland within the Application Boundary removal of invasive species such as snowberry will be undertaken to provide improvements to this existing habitat. A commitment to delivering this is set out in the Record of Environmental Actions and Commitments within the **fiEMP (Document Reference 7.3)**.

8.8.35 **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)** identifies areas of the River Itchen where enhancement measures will be provided. Measures will align with the Environment Agency's River Itchen Restoration Strategy. These areas are likely to include riparian planting and / or channel narrowing by marginal planting. A commitment to delivering this is set out in the Record of Environmental Actions and Commitments within the **first iteration Environmental Management Plan (fiEMP) (Document Reference 7.3)**.

## 8.9 Assessment of likely significant effects

8.9.1 This section presents the assessment of likely significant effects for construction and operation on important biodiversity receptors set out in **Section 8.6**. As set out in **Section 8.4**, important biodiversity features have been identified, and the potential impacts from the Scheme on those receptors have been described in accordance with the criteria set out in **Table 8.4** and **Table 8.5**. The assessment of effects takes into account the potential impacts to each important biodiversity receptor following the implementation of mitigation measures set out in **Section 8.8**. The significance of residual effects has been assessed in line with CIEEM's EclA methodology, as set out in **Paragraph 8.4.17**, and presented in **bold** at the end of each section.

### Construction (including site preparation)

8.9.2 The majority of potential effects would arise during the construction phase. These are described in the following sections.

### European Designated Areas

8.9.3 Potential impacts to the River Itchen SAC associated with the construction phase would be:

- Habitat loss or gain
- Fragmentation of populations or habitats
- Disturbance
- Habitat degradation

- 8.9.4 The River Itchen SAC is crossed by the Scheme via existing road bridges on the M3, A34 and A33. The Scheme also includes a new foot/cycle bridge over the SAC between the existing Kingsworthy Bridge and Itchen Bridge (as shown on the **General Arrangement Plans (Document Reference 2.5)**, and improvement works to Kingsworthy Bridge. In addition, the surface water drainage system would require two new drainage outfalls into the SAC to be installed, and refurbishment of an existing outfall (see **Appendix 2.1 (Drainage Outfall Methodology Optioneering Report)** of the **ES (Document Reference 6.3)** for further information).
- 8.9.5 The construction/refurbishment of the three drainage outfalls would result in permanent loss of approximately 2m<sup>2</sup> of existing riverbank in each location, which would be replaced with a concrete headwall. In this area the riverbanks have been heavily modified during construction of the existing road bridges, and the Itchen Way footpath runs along the top of the bank. The predominant habitat along the riverbank is woodland and scrub which is not a qualifying feature of the SAC. There would be no permanent loss of qualifying habitats of the SAC (water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation).
- 8.9.6 Some of the temporary construction working areas would be located on the Itchen Way footpath, although some additional vegetation clearance would also be required. This loss would be temporary and short-term, and after construction is completed existing woodland and scrub would either be allowed to naturally regenerate, or replanted if required, with further details provided in **Appendix 7.6 (Outline Landscape and Ecological Management Plan)** of the **ES (Document Reference 6.3)**. In addition, temporary damming and dewatering of the River Itchen around each structure would be required. The short-term temporary damming and dewatering would be localised around the drainage outfalls, and extend approximately 5-10 metres along the riverbank, and across no more than 50% of the river width. This is likely to result in short-term temporary degradation of the river and riverbed during construction of the drainage outfalls. Works would be undertaken sequentially, so only one location would be degraded at any one time. There would be no permanent loss or degradation of qualifying SAC habitats. Given the nature of the habitats present within the works areas, and the small extent of area to be affected when considered within the context of the wider River Itchen SAC, the works are highly unlikely to affect the overall integrity of the River Itchen SAC, nor result in a significant reduction in the functioning of the habitat or species for which the SAC is designated.
- 8.9.7 Passage for fish along the River Itchen would be maintained at all times, and in-river working would follow timing restrictions set out by the Environment Agency. As such, potential fragmentation and disturbance impacts to fish would be avoided.
- 8.9.8 Whilst construction activities may temporarily reduce permeability for otter along the southern bank of the river in the short-term, otter would still be able to freely move along the channels of the River Itchen, the opposite (northern) riverbank, other channels of the river, and adjacent terrestrial habitats. In addition,



restriction on timing of works set out in the **fiEMP (Document Reference 7.3)** to avoid night-time working would avoid disturbance impacts to otter.

- 8.9.9 Construction of the new foot/cycle bridge over the River Itchen would result in additional shading of the River Itchen SAC which could result in habitat degradation through a variation in aquatic and terrestrial plant growth. The new foot/cycle bridge would be approximately 3.5m wide, and with an open fenced side panels designed to minimise shading. The bridge is located within a stretch of the river which is already heavily shaded by the adjacent Itchen Bridge, Kingsworthy Bridge and tree canopy. As such, potential impacts are likely to result in no change (no observable impact) compared to the existing situation.
- 8.9.10 The existing Kingsworthy Bridge may require strengthening of the existing concrete edge beams. If required, this strengthening would be in the form of carbon fibre plates that are stuck to the underside of the edge beams, following some concrete removal removed via grinding. In order to fix the carbon fibre plates onto the bridge, beam access is required for up to 3 weeks duration, either from a pontoon or from an overhung system from the bridge deck. Measures to prevent dust entering the river would be utilised, including a vacuum system and a dust protection frame with a cover placed across the river in the work area for the duration of the concrete grinding operation. This work is scheduled for Phase 1 – spring 2024 to winter 2025.
- 8.9.11 Construction works (including earthworks, piling, and spoil storage) have potential to result in short term temporary impacts from increased pollutants such as silt and dust, and as such, a reduction in water quality, which could result in habitat degradation. A package of pollution prevention measures designed to avoid increased pollution during construction, are set out in the **fiEMP (Document Reference 7.3)**.
- 8.9.12 There is potential for indirect impacts to the SAC as a result of changes to groundwater flows as a result of excavation and piling. As set out in **Chapter 13 (Road Drainage and the Water Environment)** of the **ES (Document Reference 6.1)**, following mitigation secured through the **fiEMP (Document Reference 7.3)**, there would no measurable change to groundwater receptors resulting in a negligible impact.
- 8.9.13 Following the inclusion of the mitigation outlined in **Section 8.8**, all identified potential impacts from construction activities would result in no change (no observable impact) or negligible impacts (being temporary with no effect on the integrity or key characteristics) to the River Itchen SAC (a receptor of International importance). This results in a 'slight' effect which is not significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to the River Itchen SAC would be **not significant**.
- 8.9.14 A Habitats Regulations Assessment of potential effects to the River Itchen SAC which is presented in the **Habitats Regulations Assessment (Document Reference 7.5)** concludes that once standard avoidance and mitigation

measures are applied, there would be **no significant effect** that would affect the integrity of the River Itchen SAC.

8.9.15 Mottisfont Bats SAC is located approximately 16km from the Scheme. Given the distance and absence of impact pathways, there would be no change to this SAC of International importance, resulting in a 'Neutral' effect which is not significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to Mottisfont Bats SAC would be **not significant**.

8.9.16 A Habitats Regulations Assessment of potential effects to Mottisfont Bats SAC which is presented in the **Habitats Regulations Assessment (Document Reference 7.5)** concludes that there would be **no likely significant effects** to Mottisfont Bats SAC.

#### *Other statutory designated areas*

8.9.17 Potential impacts to the River Itchen SSSI associated with the construction phase would be:

- Habitat loss or gain
- Fragmentation of populations or habitats
- Disturbance
- Habitat degradation

8.9.18 Many of the reasons for the designation of the River Itchen SSSI are broadly the same as those for the designation as the River Itchen SAC. Potential construction impacts associated with the River Itchen and species which it supports are described in the European Designated Areas section above.

8.9.19 Additionally, the SSSI citation also includes some habitats adjacent to the river channel (fen meadow, flood pasture and swamp habitats), and water vole. Construction of the Scheme would not result in direct effects through habitat loss or fragmentation to SSSI habitats, including habitats within the Winnall Moors Nature Reserve.

8.9.20 The SSSI designation includes a section of the M3 within the north-east of the Application Boundary. This area does not include qualifying features (habitats or species) of the SSSI, and it is likely to have been included in the SSSI boundary for ease of mapping. The only works currently proposed in this area are the installation of one Variable Message Sign (VMS) within the highway verge. Works to install the VMS sign would be restricted to the highway verge and would not result in direct effects to qualifying features of the SSSI, resulting in no change (no observable impact) to the SSSI.

8.9.21 Construction works (including earthworks, piling, and spoil storage) have potential to result in short term temporary impacts from increased pollutants such as silt and dust, and as such, a reduction in water quality, which could

result in degradation of SSSI habitats adjacent to the Scheme. However, a package of pollution prevention measures, designed to avoid increased pollution during construction have been set out in the **fiEMP (Document Reference 7.3)**.

- 8.9.22 There is potential for indirect impacts to the SSSI as a result of changes to groundwater flows as a result of excavation and piling. As set out in **Chapter 13 (Road Drainage and the Water Environment)** of the **ES (Document Reference 6.1)**, following mitigation secured through the **fiEMP (Document Reference 7.3)**, there would no measurable change to groundwater receptors resulting in a negligible impact.
- 8.9.23 Potential impacts to water vole, a qualifying feature of the SSSI, are set out in the Water Vole section below.
- 8.9.24 Following the inclusion of the mitigation outlined in **Section 8.8**, all identified potential impacts from construction activities would result in no change (no observable impact) or negligible impacts (being temporary with no effect on the integrity or key characteristics) to the River Itchen SSSI (a receptor of National importance). This results in an effect of 'Slight' significance which is not significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to the River Itchen SSSI would be **not significant**.
- 8.9.25 St Catherine's Hill SSSI is located approximately 500m south of the Scheme. No direct or indirect impacts on the SSSI are anticipated during the construction phase, due to the distance and physical separation from the Scheme. As such there would be no change (no observable impact) to the St Catherine's Hill SSSI (a receptor of National importance). This results in an effect of 'Neutral' significance which is not significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to St Catherine's Hill SSSI would be **not significant**.

#### **Non-statutory Designated Areas**

- 8.9.26 Potential impacts to non-statutory designated areas associated with the construction phase would be:
- Habitat loss or gain
  - Fragmentation of populations or habitats
  - Habitat degradation
- 8.9.27 Easton Down SINC is located partially within the Application Boundary, however the SINC would be fenced and protected at all times from construction activity resulting in no direct impacts from habitat loss or fragmentation. There is potential for habitat degradation within the SINC from indirect construction impacts such as dust. Measures to control dust and other pollutants during construction are set out in the **fiEMP (Document Reference 7.3)**. Following the

inclusion of the mitigation outlined in **Section 8.8**, construction activities would result in no change to the Easton Down SINC, resulting in a 'Neutral' impact which is not significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to Easton Down SINC would be **not significant**.

- 8.9.28 All other non-statutory designated areas (of county importance) (see **Appendix 8.1y (Desk Study Report)** of the **ES (Document Reference 6.3)**) fall outside the Application Boundary, and there would be no direct impacts from habitat loss. Those non-statutory designated areas in proximity to the Scheme have potential to be impacted by pollutants during construction such as dust, however measures to control dust and other pollutants during construction are set out in the **fiEMP (Document Reference 7.3)**. Following the inclusion of the mitigation outlined in **Section 8.8**, construction activities would result in no change to other non-statutory designated areas, resulting in a 'Neutral' impact which is not significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to all other non-statutory designated areas would be **not significant**.

### **Habitats**

- 8.9.29 The potential impacts to habitats associated with the construction phase would be:
- Habitat loss or gain
  - Fragmentation
  - Habitat degradation
- 8.9.30 The construction phase of the Scheme would result in habitat losses and gains of both temporary and permanent nature. Permanent gains are classified as habitat created in the National Highways soft estate (or land owned or managed by National Highway) and where habitat has been re-instated.
- 8.9.31 Habitat losses and gains are summarised in **Table 8.7**. These losses and gains are also set out in full within **Appendix 8.2 (Biodiversity Net Gain Assessment Report)** of the **ES (Document Reference 6.3)**, which also takes into consideration other factors such as habitat condition.
- 8.9.32 No irreplaceable habitats such as ancient woodland or veteran trees are present within the Application Boundary (see **Section 8.6**), and none would be affected during construction.
- 8.9.33 Habitats within the Application Boundary which would be lost during construction include those within the existing highway boundary, as well as habitat within adjacent farmland. HPI which would be lost and assessed to be of local importance include; hedgerows, lowland calcareous grassland and OMH. The area of lowland mixed deciduous woodland HPI within the Application Boundary would be retained. Other habitats (as described in

**Section 8.6)** would also be lost. N.B. Whilst ‘other habitats’ are of ‘less than local’ nature conservation importance and do not constitute important biodiversity features for the purpose of this assessment, all habitats have been included within the metric calculations set out in **Appendix 8.2 (Biodiversity Net Gain Assessment Report)** of the **ES (Document Refence 6.3)**. There would be no loss of internationally or nationally important habitats.

8.9.34 Habitats which would be gained during construction would include lowland chalk grassland, species rich grasslands, native broadleaved woodland and scrub, waterbodies and associated wetland habitats. An area of existing grassland to the west of the M3 would be enhanced through favourable management and overseeding.

Table 8.7: Summary of habitat losses (HPI only) and gains during construction

Existing habitat	Value	Habitat loss (ha)	New habitat	Habitat gain (ha)	Net area gain (ha) (gain - loss)
Lowland chalk grassland	Local	0.10	Chalk grassland / species rich grassland	9.60 / 8.09	+17.59
Other woodland types <sup>7</sup> (including broadleaved and mixed woodlands)	Less than local	8.73	Native broadleaved woodland	10.10	+1.37
OMH	Local	0.01	N/A	N/A	-0.01
Linear habitat	Value	Habitat loss (km)	New habitat (km)	Habitat gain (m)	Net length gain (m) (gain - loss)
Hedgerow	Local	1.07	1.24	Species rich hedgerow	0.17

8.9.35 The Scheme would lead to the loss of semi-natural habitats, some of which have been assessed as being of local value. All other habitats are of less than local importance and would be replaced by similar or better habitats in the Scheme,

<sup>7</sup> Whist not HPI, other woodlands have been included to provide context to overall losses and gains of woodland habitat



as shown on **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)**.

- 8.9.36 Although the Scheme crosses the River Itchen, there would be no loss of habitat from within River Itchen. As set out in the European Designated Areas section above, construction/refurbishment of the three drainage outflows would result in the permanent loss of approximately 2m<sup>2</sup> of woodland and scrub on the riverbank at each location, and temporary degradation of localised areas of riverbed to facilitate the construction work.
- 8.9.37 As shown on **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)**, there would be approximately 36ha of new habitats, including chalk grassland (9.60ha), species rich grassland (8.09ha) native broadleaved woodland (10.10ha), scrub (5.88ha). Overall, there would be an increase of approximately 18ha of semi-natural habitats within the Application Boundary. In addition, 2.87ha retained area of grassland would be enhanced.
- 8.9.38 Habitat management is set out in **Appendix 7.6 (Outline Landscape and Ecological Management Plan)** of the **ES (Document Reference 6.3)**. Habitat management, where required, would be designed to maximise the biodiversity benefit of the habitats, unless highway safety or other reasons preclude this.
- 8.9.39 The initial loss of habitats is likely to result in a short-term temporary moderate adverse impact to habitats of up to Local importance, resulting in a 'Slight' adverse effect which is not significant. There would be no loss of Internationally or Nationally important habitats. In the medium-term, as the new habitats develop this would contribute to improving the local natural environment, supporting nationally and locally important wildlife, and by improving local ecological networks that are more resilient to current and future pressures. Considering the overall increase in area of habitats of ecological value, and the improvements in connectivity across ecological networks, impacts through habitat gains would result in a moderate beneficial impact to habitats, resulting in a 'Slight' beneficial effect which is not significant.
- 8.9.40 There is potential for temporary indirect impacts to habitats from dust deposition, or other pollutants during the construction phase. Measures to control dust and other pollutants during construction are set out in the **fiEMP (Document Reference 7.3)**. Following the inclusion of the mitigation outlined in **Section 8.8**, there would be no indirect impacts to habitats from dust deposition, or other pollutants during the construction phase, resulting in a 'Neutral' effect which is not significant.
- 8.9.41 In summary, the residual effects associated with the Scheme on habitats of up to International importance are **not significant**. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to habitats would be **not significant**.

### **Badgers**

8.9.42 The population of badgers within the study area is considered to be of less than local importance (see **Section 8.4**), and as such an assessment of significance effects is not required. However, to ensure legal compliance, measures have been set out within **Section 8.8** to avoid impacts from habitat loss, direct mortality, and disturbance.

### **Bats**

8.9.43 The assemblage of foraging and commuting bat species within the study area has been assessed as being of county importance (see **Section 8.4**). No bat roosts have been identified within the Application Boundary, however the use of the bridges as a roosting resource on an occasional basis cannot be entirely ruled out. Potential impacts which could arise through the construction phase are:

- Habitat loss or gain
- Disturbance from noise, vibration, and lights
- Habitat fragmentation

8.9.44 The construction of the Scheme would result in the loss of woodland, scrub, and grassland which is likely to be used to a varying extent by the assemblage of bats recorded within the study area. Much of this habitat is located adjacent to the existing highway network and would be subject to existing noise and visual disturbance from traffic which would reduce its suitability for bats. The habitat creation shown on **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)** would result in a net increase in habitats suitable for foraging bats. Many of the new habitats are linked to existing areas of high-quality bat foraging habitat, such as the mosaic of woodland along the River Itchen corridor. The Scheme would not result in the loss of any confirmed bat roosts.

8.9.45 The initial loss of foraging and commuting habitats is likely to result in a temporary minor adverse impact to bats of county importance, resulting in a 'Slight' adverse effect which is not significant. 'Slight' has been chosen over 'Neutral' due to direct habitat loss, and to provide a precautionary assessment. In the medium-term, once new habitats have been created and matured, impacts through habitat gains would result in a minor beneficial impact to bats of county importance, resulting in a 'Slight' beneficial effect which is not significant.

8.9.46 Commuting and foraging bats may be disturbed by increased light levels during the construction period. Working measures detailed in the **fiEMP (Document Reference 7.3)** include measures to avoid light spill on bat commuting routes or foraging areas, in particular the River Itchen corridor. With the mitigation set out in the **fiEMP (Document Reference 7.3)**, possible light disturbance impacts to foraging and commuting bats of county importance would be negligible,



resulting in a 'Neutral' effect which is not significant. Given light disturbance can be avoided through measures set out above, 'Neutral' is considered to be the most appropriate significance level.

8.9.47 Commuting and foraging bats may be disturbed by increased noise levels during the construction period. Construction noise levels modelled at a location adjacent to the River Itchen at Itchen Bridge are provided below in **Table 8.8**<sup>8</sup>. This location was selected as representative of likely worst-case impacts due to the presence of construction works adjacent to habitats of likely value to bats (River Itchen corridor). The construction noise levels presented represent the highest noise levels anticipated to be experienced over a working day for each construction phase. These noise levels are a maximum and are not anticipated to occur for the duration of each phase.

Table 8.8: Predicted construction noise levels adjacent the River Itchen at Itchen Bridge

Construction Phase	Sound Level
Baseline	69 dB LAeq, 16hr
Phase 0	58 dB LAeq, T
Phase 1	77 dB LAeq, T
Phase 1a	79 dB LAeq, T
Phase 1b	68 dB LAeq, T
Phase 2	69 dB LAeq, T
Phase 3	50 dB LAeq, T
Phase 3a	78 dB LAeq, T
Phase 3b	78 dB LAeq, T

8.9.48 The modelling demonstrates that levels of construction noise would vary throughout the construction period, with noise levels during some construction phases being above the existing baseline, and in others being below the existing baseline. It also shows that at 69dB, existing baseline noise levels are relatively high (equivalent to a primary school classroom<sup>9</sup>). Therefore, bats currently present on this stretch of the River Itchen are likely to be habituated to high noise levels, and occasional increases to 79dB are unlikely to result in changes

<sup>8</sup> Note: Levels generated from the modelling presented in **Chapter 11 (Noise and Vibration)** of the **ES (Document Reference 6.1)**

<sup>9</sup> [REDACTED]

to bat activity. In addition, noise from construction activities would predominantly be generated during the day when bats are not active.

- 8.9.49 Working measures set out in the **fiEMP (Document Reference 7.3)**, including avoidance of night-time working where possible would control potential impacts to bats from construction disturbance. Possible noise disturbance impacts to foraging and commuting bats of county importance would be negligible, resulting in a 'Neutral' effect which is not significant. Given noise disturbance can be avoided through measures set out above, 'Neutral' is considered to be the most appropriate significance level.
- 8.9.50 The construction of the Scheme would result in fragmentation of some habitats likely to be used by foraging and commuting bats. However much of this habitat is located within or adjacent to the existing highway network resulting in a relatively fragmented selection of habitats, and would be subject to existing noise and visual disturbance from traffic which would reduce its suitability for bats. In particular, surveys of habitats located between the M3 and the A34 concluded this area is not used by high numbers of bats, indicating fragmentation in this area would only effect small numbers of bats. There would be no fragmentation of the optimal bat habitats along the River Itchen corridor, and bats would continue to move freely through these habitats during construction. The habitat creation included in **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)** would result provision of new bat habitats which have been located to link to existing areas of high-quality bat foraging habitat, such as the mosaic of woodland along the River Itchen corridor, and to provide a strong north south habitat link along the east of the Scheme.
- 8.9.51 The initial fragmentation of foraging and commuting habitats is likely to result in a medium term temporary minor adverse impact to bats of county importance, resulting in a 'Slight' adverse effect which is not significant. In the medium-term, once new habitats have been created and matured, these would result in a minor beneficial impact to bats of county importance, resulting in a 'Slight' beneficial effect which is not significant. Given the initial fragmentation effects, 'slight' is considered more appropriate than 'neutral'.
- 8.9.52 In summary, a number of 'Neutral' or 'Slight' adverse and beneficial effects have been identified to foraging and commuting bats of county importance, none of which are significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to foraging and commuting bats would be **not significant**.

#### **Hazel dormice**

- 8.9.53 The dormouse population within the study area has been assessed as being of local importance (see **Section 8.4**). Potential impacts which could arise through the construction phase are:
- Habitat loss or gain

- Habitat fragmentation
- Direct mortality

- 8.9.54 To enable construction work to proceed lawfully, a European Protected Species licence would be obtained for the majority of vegetation clearance within the Application Boundary. All works affecting dormice habitat would be undertaken in accordance with the requirements of the licence and standing advice from Natural England. Working methods set out in the licence would avoid potential impacts to dormice through direct mortality and would ensure the favourable conservation status of the dormice population is maintained.
- 8.9.55 Construction of the Scheme would result in impacts to dormice through habitat loss and fragmentation. In advance of clearance of dormouse habitat, compensatory woodland and scrub planting would be provided within the Application Boundary. Hazel dormouse habitat loss would be compensated through provision of replacement of habitat on a minimum of a 1:1 scale. In addition, enhancement of retained dormice habitats would be undertaken. Newly created dormouse habitats would include the range of plant species necessary to support dormice throughout the year. The habitat creation shown on **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)** would result in the provision of new dormice habitats which have been located to link to existing areas of dormice habitat. This includes the mosaic of woodland along the River Itchen corridor, and would provide a strong north-south habitat link along the east of the Scheme.
- 8.9.56 The initial loss and fragmentation of habitats is likely to result in a short-term temporary minor adverse impact to dormice of Local importance, resulting in a 'Slight' adverse effect which is not significant. Given the initial loss and fragmentation effects, 'Slight' is considered more appropriate than 'Neutral'. The average lifespan of a dormouse is 5 years. New habitats should start to provide suitable conditions for dormice within 2-3 years. Therefore, the short-medium term, once new habitats have been created and begun to mature, these would result in no change to dormice of local importance, resulting in a Neutral effect which is not significant.
- 8.9.57 In summary, a number of 'Neutral' or 'Slight' adverse and beneficial effects have been identified to hazel dormice of local importance, none of which are significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to hazel dormice would be **not significant**.

### **Otter**

- 8.9.58 The population of otter within the study area (recorded along the River Itchen) is considered to be of county Importance (see **Section 8.4**). Potential impacts to otter during the construction phase could arise through:
- Noise disturbance of otter resting places and commuting routes

- Habitat fragmentation, such as through impeding permeability
- Habitat degradation, relating to possible pollution of the watercourse

8.9.59 Otter resting places have been identified near to the Scheme, the closest being approximately 50m from the Application Boundary. Otter are also known to use the section of the River Itchen which flows through the Application Boundary. It is likely that otters present in the vicinity of the Scheme would be habituated to existing levels of disturbance from light, noise and vibration associated with the highway network. Construction noise levels modelled at a location adjacent to the River Itchen at Itchen Bridge are provided below in **Table 8.9**<sup>10</sup>. The construction noise levels presented represent the highest noise levels anticipated to be experienced over a working day for each construction phase. These noise levels are a maximum and are not anticipated to occur for the duration of each phase.

Table 8.9: Predicted construction noise levels adjacent the River Itchen at Itchen Bridge

Construction Phase	Sound Level
Baseline	69 dB LAeq, 16hr
Phase 0	58 dB LAeq, T
Phase 1	77 dB LAeq, T
Phase 1a	79 dB LAeq, T
Phase 1b	68 dB LAeq, T
Phase 2	69 dB LAeq, T
Phase 3	50 dB LAeq, T
Phase 3a	78 dB LAeq, T
Phase 3b	78 dB LAeq, T

8.9.60 In relation to noise disturbance to otter, the modelling demonstrates that levels of construction noise would vary throughout the construction period, with noise levels during some construction phases being above the existing baseline, and in others being below the existing baseline. It also shows that at 69dB, existing baseline noise levels are relatively high (equivalent to a primary school classroom<sup>11</sup>). Therefore, otter currently present on this stretch of the River Itchen are likely to be habituated to high noise levels and occasional increases

<sup>10</sup> Note: Levels generated from the modelling presented in **Chapter 11 (Noise and Vibration)** of the **ES (Document Reference 6.1)**

<sup>11</sup> [REDACTED]

to 79dB are unlikely to result in changes to their activity. Noise from construction activities would predominantly be generated during the day when otters are not active.

- 8.9.61 Working measures set out in the **fiEMP (Document Reference 7.3)**, including avoidance of night-time working (otters are predominantly nocturnal) where possible would control potential impacts to otter from construction disturbance.
- 8.9.62 Construction activities associated with the drainage outflows on the River Itchen could temporarily reduce permeability for otter along the southern bank of the river due to the presence of machinery and other equipment. However, passage for otter would be maintained along the channels of the River Itchen, the opposite (northern) riverbank, other channels of the river, and adjacent terrestrial habitats. As such, no impacts to otter through habitat fragmentation are anticipated.
- 8.9.63 Habitat degradation through accidental pollution events during construction may cause impacts to the aquatic habitats or a reduction of prey. Pollution prevention measures included in the **fiEMP (Document Reference 7.3)** would avoid pollution impacts associated with the construction phase.
- 8.9.64 The inclusion of the mitigation outlined above would result in no change to otters of County importance, resulting in a Neutral effect which is not significant. In accordance with Guidelines for Ecological Impact Assessment (CIEEM, 2018), the assessment also concludes effects to otter would be **not significant**.

#### **Water vole**

- 8.9.65 The population of water vole within the study area (largely associated within the floodplain habitats adjacent to, but outside the Application Boundary) is considered to be of local importance (see **Section 8.4**). As no water voles have been identified within the Application Boundary, the Scheme would not result in the damage or destruction of their burrows or the harm of individual water vole. Potential impacts from the construction phase could include:
- Habitat degradation, e.g. through pollution incidents
  - Disturbance from noise, vibration, and lights
- 8.9.66 Habitat degradation through accidental pollution events during construction may cause impacts to the aquatic habitats in which water vole adjacent to the Scheme live. Pollution prevention and control measures included in the **fiEMP (Document Reference 7.3)** would avoid pollution impacts associated with the construction phase.
- 8.9.67 In relation to disturbance, water voles present in the vicinity of the Scheme would be habituated to existing levels of disturbance from light, noise and vibration associated with the highway network. Water vole are not present within the Application Boundary, but are present in adjacent habitats to the west, and therefore disturbance generated within the Application Boundary is likely to be

less perceptible to animals present. Whilst construction could result in elevated levels of noise and vibration, and lighting, working measures set out in the **fiEMP (Document Reference 7.3)** would control potential impacts from construction disturbance.

8.9.68 The implementation of the outlined mitigation would avoid significant adverse impacts. As such, potential impacts from construction activities would result in no change to water voles. This results in a 'Neutral' effect which is not significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to water voles would be **not significant**.

### ***Birds (breeding and wintering)***

8.9.69 The assemblage of bird species (breeding and wintering) within the study area was assessed as being of local Importance (see **Section 8.4**). Potential impacts associated with the construction phase may include:

- Habitat loss and gain
- Disturbance from noise and visual activities
- Direct mortality

8.9.70 Construction of the Scheme would result in temporary loss of habitats used by small number of notable breeding birds, including yellowhammer and skylark. The temporary loss of habitat during the construction phase would be offset by the improvement of habitats for farmland birds to the east of the M3, as shown on **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)**. New habitats within the Application Boundary to be created such as the chalk grassland east of the M3 and the species-rich grassland between the M3 and A34, would be managed for the benefit of wildlife as set out in **Appendix 7.6 (Outline Landscape and Ecological Management Plan)** of the **ES (Document Reference 6.3)**. These habitats would provide additional nesting and feeding opportunities for both breeding birds (including yellowhammer and skylark), and wintering birds.

8.9.71 The initial loss of foraging habitats is likely to result in a short-term temporary minor adverse impact to birds of local importance, resulting in a 'Slight' adverse effect which is not significant. Professional judgement has been used to select 'Slight' over 'Neutral' due to direct habitat loss being incurred. In the medium-term, once new habitats have been created and are managed appropriately, impacts through habitat gains would result in a minor beneficial impact to birds of local importance, resulting in a 'Slight' beneficial effect which is not significant.

8.9.72 Birds using retained habitat within the Application Boundary may be temporarily disturbed through noise or visual disturbance. Construction noise levels adjacent to the River Itchen are set out in **Table 8.9**. This location has been chosen to provide a representative location within the Application Boundary, and is where some of the more sensitive species (e.g. kingfisher) may be



encountered. The modelling demonstrates that levels of construction noise would vary throughout the construction period, with noise levels during some construction phases being above the existing baseline, and in others being below the existing baseline. It shows that at 69dB, existing baseline noise levels are relatively high)<sup>12</sup>. Therefore, birds currently present on this stretch of the River Itchen are likely to be habituated to high noise levels, and occasional increases to 79dB are unlikely to result in changes to bird activity. Visual disturbance may also be an issue, however this is likely to impact only a limited number of bird species such as skylark. Much of the retained habitat is already adjacent to existing highway with existing high background levels of disturbance. Measures are included in the **fiEMP (Document Reference 7.3)** to ensure there would be no disturbance to Cetti's warbler and kingfisher listed on Schedule 1 of the WCA.

8.9.73 Potential impacts to breeding birds through direct mortality would be avoided through the working methods set out in the **fiEMP (Document Reference 7.3)**. This will restrict vegetation clearance activities to outside of the breeding bird season where possible. Where not possible any vegetation removal would first be checked by an ecological clerk of works, and any active nests protected until they are no longer in use. These measures would provide protection for birds and their nests throughout the construction period.

8.9.74 Following implementation of the outlined essential mitigation there would be no change to birds of local importance from disturbance or mortality. As such, potential disturbance or mortality effects are 'Neutral', and not significant.

8.9.75 In summary, a number of 'Neutral' or 'Slight' adverse and beneficial effects have been identified to birds of local importance, none of which are significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to birds would be **not significant**.

### **Reptiles**

8.9.76 The assemblage of reptile species within the study area has been assessed as being of local importance (see **Section 8.4**). Potential impacts associated with the construction phase may include:

- Habitat loss and gain
- Direct mortality
- Habitat fragmentation

8.9.77 Reptiles are not known to be particularly susceptible to disturbance from light noise or vibration, and no impacts from these pathways are anticipated.

8.9.78 Construction of the Scheme would result in the temporary loss of semi-natural habitat which supports reptiles, particularly the road verges and field margins. During the construction phase, reptiles would be displaced or moved to suitable

■ [REDACTED]



retained habitats which would be enhanced for reptiles. The habitat lost during construction would be offset by the creation of a diverse mosaic of habitats within the Scheme, including chalk grassland, scrub and woodland edge which would provide the range of habitats required by reptiles for all stages of their life cycle.

8.9.79 In the absence of mitigation, construction activities have the potential to harm or kill reptiles. Prior to construction, a Reptile Mitigation Strategy (noted within the **fiEMP (Document Reference 7.3)**) would be produced and implemented to make certain that reptiles are safeguarded throughout the construction phases. This strategy would include trapping and translocation of reptiles which would avoid impacts through mortality. Measures would be provided to avoid entrapment of animals during construction, such as covering excavations at night or where this is not feasible providing escape ramps.

8.9.80 The Scheme may also result in the fragmentation of habitat. Any effects from fragmentation during construction would be offset by the creation of a new habitats within the Scheme, which would link retained habitats.

8.9.81 The initial loss and fragmentation of habitats is likely to result in a short-term temporary minor adverse impact to reptiles of local importance, resulting in a 'Slight' adverse effect which is not significant. 'Slight' has been chosen over 'Neutral' due to direct habitat loss. In the medium-term, once new habitats have been created, these would result in no change to reptiles of local importance, resulting in a Neutral effect which is not significant.

8.9.82 In summary, both 'Neutral' and 'Slight' adverse impacts have been identified to reptiles of local importance both of which are not significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to reptiles would be **not significant**.

### **Freshwater fish**

8.9.83 The assemblage of fish species within the River Itchen has been assessed as being of county importance (see **Section 8.4**). Potential impacts associated with the construction phase could arise through:

- Direct mortality
- Habitat degradation
- Disturbance from noise and vibration

8.9.84 The Scheme requires construction/refurbishment of three drainage outfalls on the bank of the River Itchen. To facilitate construction, temporary damming and dewatering of the River Itchen around each structure would be required. The temporary damming and dewatering would be localised around the drainage outfall, and extend approximately 5-10 meters along the riverbank, and across no more than 50% of the river. This process could result in direct mortality of fish within the working area, habitat degradation through pollution events, and

disturbance from noise and vibration. However, mitigation is outlined in the **fiEMP (Document Reference 7.3)** which would avoid direct mortality, habitat degradation and disturbance impacts to fish. Mitigation would be refined following detailed design and consulted with the Environment Agency and set out in within the siEMP secured through the DCO Requirements.

8.9.85 Accidental pollution events during construction may cause impacts to the aquatic habitats in which fish live through habitat degradation. Pollution prevention measures included in the **fiEMP (Document Reference 7.3)** would avoid pollution impacts and habitat degradation associated with the construction phase.

8.9.86 Passage for fish along the River Itchen would be maintained at all times, and in-river working would follow timing restrictions set out by the Environment Agency. As such potential fragmentation and disturbance impacts to fish would be avoided.

8.9.87 The implementation of the mitigation set out in the **fiEMP (Document Reference 7.3)** would avoid adverse impacts to freshwater fish from direct mortality, habitat degradation or disturbance. As such, potential impacts would result in no change to freshwater fish of county importance, resulting in 'Neutral' effects which are not significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to freshwater fish would be **not significant**.

#### **Terrestrial invertebrates**

8.9.88 The assemblage of terrestrial invertebrates has been assessed to be of local importance (see **Section 8.4**). Potential impacts associated with the construction phase could arise through:

- Habitat loss and gain
- Habitat fragmentation

8.9.89 Construction of the Scheme would result in the direct, permanent loss and fragmentation of habitats which are known to support notable terrestrial invertebrates. Notable invertebrates are largely associated with the flower-rich grasslands within the motorway roundabout, and to the east of the motorway roundabout. This loss and fragmentation of habitats would be offset through the creation of a mosaic of habitats within the Scheme, more varied and extensive than existing habitats to be lost. This would include extensive areas of chalk grassland, scrub and woodland which would provide the range of habitats required by terrestrial invertebrates for all stages of their life cycle. As well as providing for invertebrates already recorded within the Application Boundary, the habitats have been designed to provide foodplants for other notable invertebrate species such as the striped lychnis moth and the small blue butterfly.

8.9.90 The initial loss and fragmentation of habitats is likely to result in a short-term temporary moderate adverse impact to terrestrial invertebrates of local importance, resulting in a 'Slight' adverse effect, which is not significant. 'Slight' has been chosen over 'Neutral' due to initial habitat loss. In the medium term, the creation of new habitats would result in moderate beneficial impact to terrestrial invertebrates of local importance, resulting in a 'Slight' beneficial effect which is not significant. Professional judgement has been used to classify this impact as 'Slight' over 'Neutral' due to large habitat gains.

8.9.91 In summary, both 'Slight' adverse and beneficial effects have been identified to terrestrial invertebrates of local importance neither of which are significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to terrestrial invertebrates would be **not significant**.

#### *Aquatic invertebrates*

8.9.92 The assemblage of aquatic invertebrates within the River Itchen has been assessed as being of county importance (see **Section 8.4**). Potential impacts associated with the construction phase could arise through:

- Habitat degradation
- Species mortality
- Habitat loss

8.9.93 Habitat degradation through accidental pollution events during construction may cause impacts to the aquatic habitats in which aquatic invertebrates live. Pollution prevention measures included in the **fiEMP (Document Reference 7.3)** would avoid pollution impacts associated with the construction phase.

8.9.94 The Scheme requires construction/refurbishment of three drainage outfalls on the bank of the River Itchen. To facilitate construction, temporary damming and dewatering of the River Itchen around each structure would be required. Mortality of white-clawed crayfish could arise during in-river working, if present in this section of the River Itchen. Mitigation measures set out in Section 8.8 and included in the **fiEMP (Document Reference 7.3)** would avoid impacts through mortality associated with the construction phase.

8.9.95 Temporary damming and dewatering would be localised around the drainage outfalls, and extend approximately 5-10 meters along the riverbank, and across no more than 50% of the rivers width. This process which would be completed in a number of weeks, would result in short-term temporary habitat loss for aquatic invertebrates, including white-clawed crayfish (if present in this section of the River Itchen). Given the abundance of alternative suitable habitat within the River Itchen system this temporary adverse impact would not affect the key characteristics of the aquatic invertebrate population, and is considered to be negligible, resulting in 'Slight' effect on aquatic invertebrates of county Importance, which is not significant. In accordance with *Guidelines for*

*Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to the aquatic invertebrates would be **not significant**.

### **Notable plants**

8.9.96 The assemblage of notable plants has been assessed to be of local importance. Potential impacts associated with the construction phase could arise through:

- Habitat loss and gain

8.9.97 Construction of the Scheme would result in the direct, permanent loss of habitats which are known to support notable plants, including white helleborine a SPI. This includes five species listed on the red list of vascular plants for England, although all five species are relatively widespread in England. Notable plants are largely associated with the flower-rich grasslands within the motorway roundabout, and to the east of the motorway roundabout. This loss of habitats supporting notable plants would be offset through the creation of a mosaic of habitats within the Scheme, more varied and extensive in area than existing habitats to be lost. This would include extensive areas of chalk grassland, scrub and woodland which would provide the range of habitats required by notable plants to colonise naturally.

8.9.98 The initial loss of habitats supporting notable plants is likely to result in a temporary moderate adverse impact to notable plants of local importance, resulting in a 'Slight' adverse effect which is not significant. 'Slight' has been chosen over 'Neutral' due to initial habitat loss. In the long term, assuming natural colonisation by notable species, the creation of extensive areas new habitats would result in moderate beneficial impacts to notable plants. This would result in a 'Slight' beneficial effect which is not significant. Professional judgement has been used to classify this impact as 'Slight' over 'Neutral' due to large habitat gains.

8.9.99 In summary, both 'Slight' adverse and beneficial effects have been identified to notable plants of local importance, neither of which is significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes effects to notable plants would be **not significant**.

### **Operation**

#### **European designated areas**

8.9.100 No direct impacts are anticipated on the River Itchen SAC from operation of the Scheme. Indirect effects could arise through habitat degradation impacts during operation, as follows.

8.9.101 Air quality modelling set out in **Chapter 5 (Air Quality)** of the **ES (Document Reference 6.1)** and the associated ecological assessment of potential effects in **Appendix 8.3 (Assessment of Operational Air Quality Impacts on Biodiversity)** of the **ES (Document Reference 6.3)** shows effects from

localised changes in air quality from the Scheme will be not significant to the River Itchen SAC, of international importance.

8.9.102 There is potential for indirect impacts from pollution events such as traffic collisions with an associated reduction in water quality with subsequent effects to qualifying habitats and species. The mitigation measures set out in **Appendix 13.1 (Drainage Strategy Report)** of the **ES (Document Reference 6.3)** for managing surface water runoff from the road which includes provision of measures for treatment of surface water would avoid adverse operational impacts and are likely to be an improvement compared to the existing situation. The inclusion of the mitigation would result in a negligible beneficial impact to the River Itchen SAC of international importance, resulting in a 'Slight' beneficial effect, which is not significant.

8.9.103 In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to the River Itchen SAC would be **not significant**.

8.9.104 Mottisfont Bats SAC is over 16km from the Scheme and as such there would be no direct impacts from operation. In addition, the Scheme is located over 8.5km from a 7.5km buffer zone around the SAC considered to be most important to barbastelle bats for which the SAC is designated. As such there would be no indirect effects to the SAC e.g. from collision of bats with vehicles. Therefore potential impacts to Mottisfont Bats SAC of international importance would result in no change, resulting in 'Neutral' effects, which are not significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to the Mottisfont Bats SAC would be **not significant**.

8.9.105 Further assessment in relation to European sites can be found in the accompanying **Habitats Regulations Assessment (Document Reference 7.5)**.

#### **Other statutory designated areas**

8.9.106 The majority of the River Itchen SSSI is a component of the River Itchen SAC and the operational impacts relevant to the SSSI are the same as those described for the SAC.

8.9.107 The potential impacts on the River Itchen SSSI have been described above in the operation section on the River Itchen SAC. The SSSI is also designated for additional areas of terrestrial habitats (fen meadow, flood pasture and swamp habitats), and water voles that do not form part of the SAC. The closest area of these designated habitats to the Scheme are adjacent to the Application Boundary along its western and northern boundaries. Water voles are known to be present downstream of the Scheme. Potential impacts to terrestrial habitats and water voles (qualifying features of the River Itchen SSSI) associated with the operation phase would include:

- Habitat degradation



- 8.9.108 There is potential for habitat degradation associated with a reduction in water quality from pollution events such as traffic collisions. The mitigation measures set out in **Appendix 13.1 (Drainage Strategy Report)** of the **ES (Document Reference 6.3)** for managing surface water runoff from the road which includes provision of measures for treatment of surface water would avoid adverse operational impacts and are likely to be an improvement compared to the existing situation. The inclusion of the mitigation would result in no change to the River Itchen SSSI of national importance, resulting in Neutral effect which is not significant.
- 8.9.109 Air quality modelling (**Chapter 5 (Air Quality)** of the **ES (Document Reference 6.1)** interpreted in **Appendix 8.3 (Assessment of Operational Air Quality Impacts on Biodiversity)** of the **ES (Document Reference 6.3)**) demonstrates that where there are increases in pollutants, these are below the relevant screening thresholds, and therefore effects from localised changes in air quality from the Scheme will be not significant to the River Itchen SSSI, a designated site of national importance.
- 8.9.110 In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to the River Itchen SSSI would be **not significant**.
- 8.9.111 Air quality modelling of the Scheme (**Chapter 5 (Air Quality)** of the **ES (Document Reference 6.1)** interpreted **Appendix 8.3 (Assessment of Operational Air Quality Impacts on Biodiversity)** of the **ES (Document Reference 6.3)** has identified that for St Catherine's Hill SSSI, Cheesefoot Head SSSI, River Test SSSI, Highclere Park SSSI increases in nitrogen are below the relevant screening threshold where sensitive habitats are present, or if above the thresholds further ecological assessment of potential effects to habitats has indicated there is unlikely to be loss of species diversity and therefore effects are **not significant** to these sites of national importance.
- 8.9.112 Localised changes in air quality from the Scheme to Burghclere Beacon SSSI were below the relevant screening thresholds and were scoped out of further assessment.
- 8.9.113 In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to St Catherine's Hill SSSI, Cheesefoot Head SSSI, River Test SSSI, Highclere Park SSSI, and Burghclere Beacon SSSI would be **not significant**.

#### **Non-statutory designated areas**

- 8.9.114 The main potential for operational impacts to nearby non-statutory designated areas (details of these are presented in **Appendix 8.1y (Desk Study Report)** of the **ES (Document Reference 6.3)**), would be through habitat degradation as a result of a reduction in air quality, principally oxides of nitrogen and nitrogen deposition during operation. Any sites located over 200m from the live carriageway are unlikely to result in adverse effects of NO<sub>x</sub> or nitrogen deposition (**Chapter 5 (Air Quality)** of the **ES (Document Reference 6.1)**).



8.9.115 Air quality modelling of the Scheme (**Chapter 5 (Air Quality)** of the **ES (Document Reference 6.1)** interpreted in **Appendix 8.3 (Assessment of Operational Air Quality Impacts on Biodiversity)** of the **ES (Document Reference 6.3)** has identified that for the majority of non-designated sites, increases in nitrogen are below the 1% threshold, or if above the 1% threshold, absolute changes are below 0.4 kg N/ha/yr. Where the assessment has identified increases above the 1% threshold and 0.4 kg N/ha/yr, further ecological assessment of potential effects to habitats in **Appendix 8.3 (Assessment of Air Quality Impacts on Biodiversity)** of the **ES (Document Reference 6.3)** has indicated there is unlikely to be loss of species diversity and therefore effects are **not significant** to non-statutory sites of county importance.

8.9.116 In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment concludes operational effects to non-statutory designated areas would be **not significant**.

### **Habitats**

8.9.117 The main potential for operational impacts to the identified HPs (coastal and floodplain grazing marsh, lowland calcareous grassland, lowland fens, lowland meadows, lowland mixed deciduous woodland, purple moor grass and rush pastures, reedbeds, rivers, hedgerows, and wet woodland) and ancient woodland would be through habitat degradation as a result of a reduction in air quality, principally oxides of nitrogen and nitrogen deposition.

8.9.118 The air quality modelling set out in **Chapter 5 (Air Quality)** of the **ES (Document Reference 6.1)** and described in **Appendix 8.3 (Assessment of Air Quality Impacts on Biodiversity)** of the **ES (Document Reference 6.3)** demonstrates that effects to designated areas which contain the HPs listed above would not be **significant**.

8.9.119 **Chapter 5 (Air Quality)** of the **ES (Document Reference 6.1)** and **Appendix 8.3 (Assessment of Air Quality Impacts on Biodiversity)** of the **ES (Document Reference 6.3)** shows the effects from localised changes in air quality from the Scheme to the ancient woodlands within 200m of the ARN would not be significant to these habitats of national importance.

8.9.120 There is potential for habitat degradation associated with a reduction in water quality from pollution events such as traffic collisions. The mitigation measures set out in **Appendix 13.1 (Drainage Strategy Report)** of the **ES (Document Reference 6.3)** for managing surface water runoff from the road which includes provision of measures for treatment of surface water would avoid adverse operational impacts and are likely to be an improvement compared to the existing situation. The inclusion of the mitigation would result in no change to habitats of up to international importance, resulting in 'Neutral' effects which are not significant.

8.9.121 In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment concludes operational effects to habitats would be **not significant**.

### **Badgers**

- 8.9.122 The population of badgers within the study area is considered to be of less than local importance (see **Section 8.4**), and as such an assessment of significance effects has not been provided. However, to accord with best practice, measures have been set out within **Section 8.8** to avoid impacts to badgers through direct mortality.

### **Bats**

- 8.9.123 Potential impacts to foraging and commuting bats during the operational phase could arise through direct mortality from collision with traffic as a result of increased traffic or traffic speed. However, bat activity within the Application Boundary is generally low. And whilst the Scheme would result in widening of the M3 and provision of new slip roads, there would not be substantive changes relative to the current road network, indicating the risk of mortality to bats is unlikely to increase from the existing situation.
- 8.9.124 In addition, the provision of strategically placed planting of habitats suitable for foraging and commuting bats as part of the Scheme would link and enhance existing habitats and maintain a permeable landscape for foraging and commuting bats in the wider landscape.
- 8.9.125 Potential impacts to foraging and commuting bats during the operational phase could arise through disturbance from lighting. However, lighting has only been incorporated into the design of the Scheme within subways, underpasses, and at two gantries over the M3 south of junction 9, where it is essential for safety reasons. These are discrete areas none of which are likely to be of value to foraging and commuting bats (see **Table 8.6**). There would be no lighting elsewhere within the Scheme.
- 8.9.126 As such there would be no change from the existing situation to bats of county importance, resulting in 'Neutral' effect which is not significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to bats would be **not significant**.

### **Hazel Dormice**

- 8.9.127 There is potential for operational impacts to dormice during operational habitat management. However, **Appendix 7.6 (Outline Landscape and Ecological Management Plan)** of the **ES (Document Reference 6.3)** sets out measures to protect dormice during routine habitat maintenance, and as such there would be no impacts on dormice associated with the operational phase.
- 8.9.128 As such there would be no change from the existing situation to hazel dormice of local importance, resulting in a 'Neutral' effect which is not significant. In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to hazel dormice would be **not significant**.

## Otter

- 8.9.129 There is potential for operational impacts to otter through direct mortality resulting from collision with traffic. Whilst there would be widening of the M3 and new slip roads provided, and an increase in vehicle numbers, the Scheme would not introduce any significant new infrastructure relative to the current road network, indicating the risk to otter is unlikely to increase from the existing situation. However as set out in **Section 8.8** wildlife fencing would be provided in key locations to separate wildlife, including otter, from the live highway network. The provision of this fencing would result in a minor beneficial impact to otter of county value, resulting in a 'Slight' beneficial effect which is not significant.
- 8.9.130 There is potential for operational impacts to otter through disturbance from pedestrians and cyclists using the walking/cycling path which crosses the River Itchen, and the linking footpath to the Itchen Way. Cyclists and pedestrians using the new path are considered unlikely to present significant increase in disturbance when compared to the existing situation with the Itchen Way footpath adjacent to the river. Use would mostly be during daylight hours, whereas otter are predominantly nocturnal. Fencing will be provided along the footpath/cycleway either side of the River Itchen to avoid impacts through preventing pedestrians from entering woodland habitat potentially used by otter (although no otter signs were recorded during a specific survey of this woodland). As such potential impacts to otter would result in no change, resulting in a 'Neutral' effect which is not significant.
- 8.9.131 There is potential for operational impacts to otter through noise disturbance during operation. Noise levels modelled at a location adjacent to the River Itchen at Itchen Bridge shown only small increases in noise levels, as shown in **Table 8.10**<sup>13</sup>.

Table 8.10: Predicted operational noise levels adjacent the River Itchen at Itchen Bridge

Receptor	Daytime L <sub>Aeq,16hours</sub> (dB)					
	2027 Do Minimum	2027 Do Something	Change	2042 Do Minimum	2042 Do Something	Change
River Itchen	69.1	70.4	+1.3	65.8	68.1	+2.3

- 8.9.132 In the context of the existing high levels of noise at Itchen Bridge, these small increases in operational noise to otter of county importance would result in a negligible impact to otter, resulting in a 'Slight' effect which is not significant.

<sup>13</sup> Taken from **Chapter 11 (Noise and Vibration)** of the **ES (Document Reference 6.1)**

- 8.9.133 In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to otter would be **not significant**.

#### **Water vole**

- 8.9.134 Potential impacts to water voles could arise through habitat degradation associated with a reduction in water quality from pollution events such as traffic collisions. The mitigation measures set out in the **Appendix 13.1 (Drainage Strategy Report)** of the **ES (Document Reference 6.3)** for managing surface water runoff from the road which includes provision of measures for treatment of surface water would avoid adverse operational impacts and are likely to be an improvement compared to the existing situation. The inclusion of the mitigation would result in no change to water vole of local importance, resulting in 'Neutral' effect which is not significant.
- 8.9.135 In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to water vole would be **not significant**.

#### **Birds (breeding and wintering)**

- 8.9.136 Potential impacts to birds during the operational phase could arise through direct mortality from collision with traffic as a result of increased traffic or traffic speed. As mentioned in **Table 8.6** a dead barn owl was identified on the M3 in 2017, likely a casualty of collision with traffic. Whilst the Scheme would result in widening of the M3 and provision of new slip roads and an increase in vehicle numbers, there would not be substantive changes relative to the current road network, indicating the risk of mortality to birds is unlikely to increase from the existing situation.
- 8.9.137 Potential impacts to birds during the operational phase could arise through disturbance from lighting. However, lighting has only been incorporated into the design of the Scheme within subways, underpasses, and at two gantries over the M3 south of junction 9, where it is essential for safety reasons. There would be no lighting elsewhere within the Scheme.
- 8.9.138 As such during the operational phase there would be no change to birds of local importance from the existing situation, resulting in 'Neutral effect' which is not significant.
- 8.9.139 In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to birds would be **not significant**.

#### **Reptiles**

- 8.9.140 There is potential for operational impacts to reptiles from direct mortality during routine management of habitats within the Scheme, such as mowing and scrub clearance. However, **Appendix 7.6 (Outline Landscape and Ecological**

**Management Plan)** of the **ES (Document Reference 6.3)** sets out measures to protect reptiles during routine habitat maintenance, which would avoid impacts to reptiles during the operational phase.

- 8.9.141 As such during the operational phase there would be no change to reptiles of local importance from the existing situation, resulting in 'Neutral effect' which is not significant.
- 8.9.142 In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to reptiles would be **not significant**.

#### **Freshwater fish**

- 8.9.143 Potential impacts to freshwater fish could arise through habitat degradation associated with a reduction in water quality from pollution events such as traffic collisions. The mitigation measures set out in **Appendix 13.1 (Drainage Strategy Report)** of the **ES (Document Reference 6.3)** for managing surface water runoff from the road which includes provision of measures for treatment of surface water would avoid adverse operational impacts and are likely to be an improvement compared to the existing situation. The inclusion of the mitigation would result in no change to freshwater fish of county importance, resulting in 'Neutral' effect which is not significant.
- 8.9.144 In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to freshwater fish would be **not significant**.

#### **Terrestrial invertebrates**

- 8.9.145 There is potential for operational impacts to terrestrial Invertebrates during operational habitat management. However, **Appendix 7.6 (Outline Landscape and Ecological Management Plan)** of the **ES (Document Reference 6.3)** sets out measures to avoid impacts to terrestrial Invertebrates during routine habitat maintenance. The inclusion of the mitigation would result in no change to terrestrial Invertebrates of local importance, resulting in 'Neutral' effect which is not significant.
- 8.9.146 In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to terrestrial invertebrates would be **not significant**.

#### **Aquatic invertebrates**

- 8.9.147 Potential impacts to aquatic invertebrates could arise through habitat degradation associated with a reduction in water quality from pollution events such as traffic collisions. The mitigation measures set out in **Appendix 13.1 (Drainage Strategy Report)** of the **ES (Document Reference 6.3)** for managing surface water runoff from the road which includes provision of measures for treatment of surface water would avoid adverse operational



impacts and are likely to be an improvement compared to the existing situation. The inclusion of the mitigation would result in no change to aquatic invertebrates of county importance, resulting in 'Neutral' effect which is not significant.

- 8.9.148 In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to aquatic invertebrates would be **not significant**.

#### **Notable plants**

- 8.9.149 There is potential for operational impacts to notable plants during operational habitat management. However, **Appendix 7.6 (Outline Landscape and Ecological Management Plan)** of the **ES (Document Reference 6.3)** sets out measures to avoid impacts to notable plants during routine habitat maintenance. The inclusion of the mitigation would result in no change to notable plants of local importance, resulting in 'Neutral' effect which is not significant.
- 8.9.150 In accordance with *Guidelines for Ecological Impact Assessment* (CIEEM, 2018), the assessment also concludes operational effects to notable plants would be **not significant**.

### **8.10 Monitoring**

- 8.10.1 The assessment of effects from the Scheme has not identified effects which are considered likely to be significant, and therefore in EIA terms monitoring is not required. However, during operation of the Scheme, essential mitigation in relation to important biodiversity receptors would include the management and monitoring of habitat creation and enhancement measures. Further details are provided within **Appendix 7.6 (Outline Landscape and Ecological Management Plan)** of the **ES (Document Reference 6.3)**, with a full LEMP secured through DCO Requirement in agreement with statutory consultees.
- 8.10.2 Monitoring of the badger and dormice populations is necessary as part of the licencing requirements and would be agreed with Natural England. The duration of monitoring would be agreed with Natural England.

### **8.11 Summary**

- 8.11.1 This assessment has been guided by *DMRB LA 108 Biodiversity* (Highways England, 2020) along with *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018).
- 8.11.2 Data collection has included a desk study and a range of field surveys undertaken between 2017 and 2021. A number of important biodiversity receptors have been identified within the study area. These include various designated areas such as the River Itchen SAC/SSSI, Habitats of Principal Importance, and protected and notable species such as dormice and badgers.
- 8.11.3 Potential impacts from construction, operation, and maintenance of the Scheme that could relate to important biodiversity receptors include: habitat loss and



gain, fragmentation of populations or habitats, disturbance, habitat degradation, and species mortality.

8.11.4 The mitigation hierarchy has been embedded within the assessment process, whereby the design has sought to avoid adverse impacts in the first instance through an iterative approach to design, e.g. informing alignment to avoid sensitive receptors where possible. In areas where avoidance is not possible, measures have been included to prevent or reduce potentially significant negative effects. As a last resort, measures to compensate negative effects have also been included, e.g. habitat creation to offset impacts associated with habitat loss and fragmentation where these cannot be avoided. A package of mitigation measures have been provided, as set out in **Section 8.8**, including provision of substantial areas of habitats of ecological value which are appropriate to the local area, including chalk grassland, native broadleaved woodland and scrub.

8.11.5 The assessment identifies a number of adverse and beneficial impacts to biodiversity receptors, however in all cases the residual effects are not significant.