

# **M3 Junction 9 Improvement**

**Scheme Number: TR010055**

## **6.3 Environmental Statement Appendix 8.1k - Terrestrial Entomological Walkover Survey Report 2017**

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

**Planning Act 2008**

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

**Volume 6**

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## Infrastructure Planning

### Planning Act 2008

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M3 Junction 9 Improvement  
Development Consent Order 202[x]

<p><b>6.3 ENVIRONMENTAL STATEMENT- APPENDIX 8.1k: TERRESTRIAL ENTOMOLOGICAL WALKOVER SURVEY REPORT 2017</b></p>
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# M3 JUNCTION 9 IMPROVEMENT SCHEME

## TERRESTRIAL ENTOMOLOGICAL WALKOVER SURVEY REPORT

**Highways England**

### **Second Issue**

Project no: 70016638

Date: August 2017



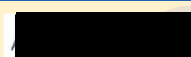



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# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b> .....	<b>0</b>
<b>1 INTRODUCTION</b> .....	<b>1</b>
1.1 PROJECT BACKGROUND.....	1
1.2 ECOLOGICAL BACKGROUND.....	1
1.3 AIMS AND OBJECTIVES.....	1
<b>2 METHODOLOGY</b> .....	<b>2</b>
2.1 WALKOVER SURVEY.....	2
DATES AND PERSONNEL .....	2
LIMITATIONS.....	2
<b>3 RESULTS AND DISCUSSION</b> .....	<b>3</b>
3.1 GENERAL.....	3
3.2 HIGH POTENTIAL FOR IMPORTANT INVERTEBRATE ASSEMBLAGES.....	3
3.3 LOW POTENTIAL FOR IMPORTANT INVERTEBRATE ASSEMBLAGES.....	4
<b>4 RECOMMENDATIONS</b> .....	<b>6</b>
<b>5 CONCLUSIONS</b> .....	<b>8</b>

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## TABLES

TABLE 4-1	FURTHER SURVEYS (IF REQUIRED) .....	6
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## EXECUTIVE SUMMARY

M3 Junction 9 has been proposed for redevelopment in order to help reduce congestion by improving the flow of traffic. Three options for this scheme are currently being investigated.

In order to carry out an evaluation of the potential conservation value of the Survey Area for invertebrate assemblages, an appraisal of the Survey Area (defined as the area to be affected by works and an additional 100 m buffer) was visited by an entomologist. The likely key habitats and features present in the Survey Area were assessed based on the diversity of the structure of the vegetation present and floristic diversity. Much of the Survey Area includes habitats unsuitable to support important invertebrate assemblages. This walkover did, however, identify several areas which are of high potential for important invertebrate assemblages including: two wet meadows to the west of the A34; two areas of dry grassland associated with woodland; and scrub margins and the verges of a lane (Easton Lane).

To obtain a more robust baseline of information and to be able to carry out an appropriate assessment of the likely impacts of the scheme, further surveys have been recommended for high potential areas likely to be impacted by the Proposed Works, with reference to best practice guidance (Drake *et al* 2007), where available.

# 1 INTRODUCTION

## 1.1 PROJECT BACKGROUND

1.1.1 Junction 9 of the M3 is a key transport interchange on the strategic road network which connects South Hampshire and the wider sub-region, with London via the M3 and the Midlands via the A34 (which also links to the principal east-west A303 corridor). M3 Junction 9 has been proposed for redevelopment in order to help reduce congestion around this stretch of the road by improving the flow of traffic.

1.1.2 The works are hereafter referred to as 'the Proposed Works'. Further details of the Proposed Works are presented within the PCF Stage 2 Environmental Study Report (ESR). The anticipated maximum extent of the works is shown on Figure 1, and is hereafter referred to as 'the Site'.

## 1.2 ECOLOGICAL BACKGROUND

1.2.1 An ecological desk study was undertaken with respect to the Proposed Works by WSP in 2016. 167 notable invertebrate species records were obtained from within a 2km radius of the Site, the vast majority of which were of butterflies and moths (Lepidoptera). Three records were obtained from grid squares that overlap with the Site: small heath butterfly *Coenonympha pamphilus*, silver wash fritillary butterfly *Argynnis paphia* and stag beetle *Lucanus cervus*.

1.2.2 A Phase 1 habitat survey was carried out by WSP during 2017, which confirmed the presence of habitats of potential value to notable invertebrate species and communities within the Site

## 1.3 AIMS AND OBJECTIVES

1.3.1 The aims of this report are to:

- Set out the methods and findings of an entomological walkover of the Survey Area (defined as all habitats within 100m of the Site).
- Provide an evaluation of the potential conservation value of the Survey Area for invertebrate assemblages, including an appraisal of key habitats/features likely to be of greatest invertebrate value.
- If appropriate, identify the need for further targeted surveys with reference to best practice guidance, where available.



# 2 METHODOLOGY

## 2.1 WALKOVER SURVEY

2.1.1 The walkover Survey Area comprised the footprint of all works and land within a 100m radius of this, where access was available, hereafter referred to as the 'Survey Area'. Habitats within the Survey Area were categorised as 'low' or 'high' potential for important invertebrate assemblages, dependent on the presence of features which might be of particular value for invertebrates, or which might limit invertebrate interest. High potential habitats are those with the potential to support noteworthy invertebrate assemblages and are therefore recommended for further targeted invertebrate surveys should they be either directly or indirectly affected by the development proposals. Owing to the lack of any defined or set methodology for invertebrate habitat quality assessment, the survey relied on the professional judgement of the surveyors and their experience of working on similar projects.

2.1.2 The categories given to the different habitat parcels are intended to represent the relative interest of the different areas within the Survey Area, rather than to indicate their quality on a National or Regional scale. However, the categories are to some extent habitat-specific (grassland is graded relative to other grassland, not to ancient woodland) and useful categorisation cannot be made without some consideration to the wider context.

### DATES AND PERSONNEL

2.1.3 The walkover survey was completed on the 25 June 2017 by Dr Jim Fairclough MCIEEM of BSG Ecology, with assistance from John Baker MCIEEM also of BSG Ecology. Jim is a Principal Ecologist with extensive experience in carrying out invertebrate surveys, has completed a PhD looking at invertebrate communities associated with dung in 2004, and provides training on invertebrate survey techniques and identification.

### LIMITATIONS

2.1.4 No areas of habitats immediately adjacent to the A34 or M3 carriageways were accessed during this survey. However, based on the findings of the Phase 1 habitat survey (for which roadside access was obtained), sufficient baseline information is available to make robust conclusions regarding the value of those habitats to invertebrates. Other than this, no limitations to the above survey were encountered.

# 3 RESULTS AND DISCUSSION

## 3.1 GENERAL

3.1.1 Across the Survey Area there are a range of different habitats and features of potential importance to invertebrates. Below, the habitats and areas present within the Survey Area are categorised into 'low' and 'high' potential for important invertebrate assemblages. Target Notes (TNs) and areas of high potential for invertebrates are shown on Figure 2.

## 3.2 HIGH POTENTIAL FOR IMPORTANT INVERTEBRATE ASSEMBLAGES

3.2.1 The Winnal Moors water meadows associated with the River Itchen are present in the north-western part of the Survey Area. These are designated as part of the River Itchen Site of Special Scientific Interest (SSSI) with the main channels of the river designated as a Special Area of Conservation (SAC). The land within the Survey Area comprises water meadows which are periodically inundated. At the time of the survey, these were dry, though water was present in the drains which demarcate their margins.

3.2.2 The sward in the meadow in Area 1 (see Figure 2) is tall (up to 80cm) with occasional areas of trampled ground as a result of it being grazed by a small number of cattle which had recently been moved to the meadow as part of the management of the site. This has created a more diverse sward structure. The vegetation recorded included: reed canary grass *Phalaris arundinacea* (the dominant grass species), yellow iris *Iris pseudacorus*, lesser pond sedge *Carex acutiformis*, hard rush *Juncus inflexus*, broad-leaved dock *Rumex obtusifolius*, curled dock *Rumex crispus*, woody nightshade *Solanum dulcamara*, common comfrey *Symphytum officinale*, common ragwort *Senecio jacobaea*, common nettle *Urtica dioica*, marsh thistle *Cirsium palustre*, red fescue *Festuca rubra*, amphibious bistort *Persicaria amphibia*, water mint *Mentha aquatica*, wild angelica *Angelica sylvestris*, marsh-bedstraw *Galium palustre* and tussock sedge *Carex paniculata*.

3.2.3 This meadow was bordered by woodland dominated by willow on the northern side and scattered willows (mainly goat willow *Salix caprea*) and alder *Alnus glutinosa* (TN1) were also present. On the north-eastern side of this meadow is a bank which slopes down from the verge of the A34. This supported a diverse sward structure with species such as hemp-agrimony *Eupatorium cannabinum*, common reed *Phragmites australis* and common nettle. Area 2 (see Figure 2) is of a similar composition and structure but no grazing was noted. The drain on the southern and western edge of Area 1 (TN2 and 3) supports a range of species of a similar composition to the meadow itself but grazing was excluded from the banks of the drain. The area between Area 1 and 2 supports a mix of wet meadow as described for Areas 1 and 2 and woodland.

3.2.4 A hay meadow is also present immediately to the south of Area 1 (TN4). This had recently been cut at the time of the survey, but it may support a wider diversity of herbs and graminoids (grasses and grass like species) than was immediately apparent. This should also, therefore, be included in the habitats of high potential as a precautionary measure. However, should further surveys be needed for Area 1, the need for surveys in this area (the hay meadow) will be determined based on the floristic diversity and structure of the sward present.

3.2.5 Overall, the habitats of the water meadows are likely to be of importance to invertebrates owing to: the varied structural diversity (grassland, scrub and trees); species diversity of herbs; relatively sheltered aspect afforded by trees and wooded belts; and seasonally inundated ground, which can support a range of specialist invertebrates (notably beetles and flies; Coleoptera and Diptera respectively).

- 3.2.6 The habitats enclosed by the roundabout of Junction 9 include some dense plantation woodland habitats with a dense scrub layer. The species include ash *Fraxinus excelsior*, hawthorn *Crataegus monogyna* and dogwood *Cornus sanguinea*. Although these offer limited diversity in terms of species composition, the structural diversity and shelter they provide heightens the interest to invertebrates of the adjacent open areas, especially at the ecotone between the woodland and open areas. These open areas adjacent to the road verges support grassland which, in places, is herb-rich. This includes Areas 3 and 4 (see Figure 2).
- 3.2.7 Area 3 includes an underpass on its western side and the banks created to accommodate this provide a range of aspects. The vegetation structure is fairly diverse and ranges from a long sward (50cm) down to much shorter swards, which either arise from drier conditions or management (mowing). The grasses recorded include false oat-grass *Arrhenatherum elatius*. This species made up about 40% of the sward. However, a number of other species were also present either as part of the taller sward or forming lower swards. These included: goldenrod *Solidago virgaurea*, early goldenrod *Solidago gigantea*, perforate St. John's-wort *Hypericum perforatum*, agrimony *Agrimonia eupatoria*, yarrow *Achillea millefolium*, goat's-beard *Tragopogon pratensis*, wild teasel *Dipsacus fullonum*, red clover *Trifolium pratense*, musk-mallow *Malva moschata*, welled thistle *Carduus crispus*, hogweed *Hareclum sphondylium*, bristly oxtongue *Helminthotheca echioides*, upright hedge parsley *Torilis japonica*, hemp-agrimony *Eupatorium cannabinum*, tufted vetch *Vicia cracca*, wild carrot *Daucus carota*, wild marjoram *Origanum vulgare*, wild basil *Cinopodium vulgare*, fairy flax *Linum catharticum*, oxeye daisy *Leucanthemum vulgare*, common bird's-foot-trefoil *Lotus corniculatus* and toadflax *Linaria vulgare*. Such a diversity of plants, with species (including the aforementioned shrubs) that flower through much of the growing season is likely to support a varied invertebrate fauna, either feeding off the foliage (phytophagous species) or visiting the flowers to collect nectar or pollen. The southern aspects of some of these areas, the shorter sward height and the sheltered position (in some places) will benefit warmth-loving (thermophilous) species, such as solitary bees and wasps (Hymenoptera: Aculeata).
- 3.2.8 Area 4 (see Figure 2) was less diverse in terms of structure, being dominated by a short sward with some patches of bare ground. Several anthills were noted as developing in this area. The species list was similar to that of Area 3 with further species including: bladder campion *Silene vulgaris*, white clover *Trifolium repens*, common centaury *Centarium erythraea*, hedge bedstraw *Galium mollugo*, common knapweed *Centaurea nigra*, evening primrose *Oenothera biennis*, goat's-rue *Galega officinalis*, common fleabane *Pulicaria dysenterica* and ploughman's-spikenard *Inula conyzae*.
- 3.2.9 To the east of the Junction (shown as Area 5 on Figure 2), Easton Lane runs south-west to north-east and is lined on both sides with mature hedgerows. These support species such as blackthorn *Prunus spinosa*, hawthorn, dog rose *Rosa canina* agg. and bramble *Rubus fruticosus* agg.. The blackthorn was suckering into the verges in places. These verges also support grassy margins, with false oat-grass as well a number of herb species, including common nettle, common knapweed, agrimony, hogweed, hedge bedstraw, black horehound *Ballota nigra*, field scabious *Knautia arvensis*, mugwort *Artemisia vulgaris* and wild onion *Allium vineale*. The structure, shelter and nectar and pollen sources afforded by the hedgerows along this lane makes it a linear sun trap that will benefit (amongst other groups) thermophilous (warmth-loving) species, spiders (Araneae), grasshoppers and crickets (Orthoptera), and butterflies and moths (Lepidoptera).

### 3.3 LOW POTENTIAL FOR IMPORTANT INVERTEBRATE ASSEMBLAGES

- 3.3.1 Certain areas within the River Itchen SSSI and Winnal Moors reserve were assessed as having low potential to support significant invertebrate assemblages. This included the drier meadows in the northern part of the Survey area (TN 5). For example, the area between the Itchen and the A34 (TN 6) is dominated by common reed with a fairly uniform structure.

- 3.3.2 Two large meadows (TN7) are present in the central part of the Survey Area, immediately to the north of the junction. These were grazed by cattle and managed relatively intensively, though the sward did show some diversity in terms of herb species the structure offered is very limited.
- 3.3.3 An area of grassland (TN8), with recently planted woodland, is present to the south of Easton Lane in the Survey Area. This appears to be recently unmanaged, and as such the structure of the sward is relatively uniform. The herb species recorded were limited, but included ploughman's spikenard, colt's-foot *Tussilago farfara*, teasel, mugwort, common fleabane and wild carrot. Therefore this habitat has been categorised as being of low potential although it may develop into a more diverse area in time.
- 3.3.4 The majority of the remainder of the Survey Area comprises intensively managed arable farmland with narrow field margins. This agricultural landscape offers very limited sheltering and foraging opportunities for invertebrates and is therefore regarded as low potential for invertebrates. Other habitats include the infrastructure associated with a supermarket (parking areas and the store itself) and industrial areas.

# 4 RECOMMENDATIONS

4.1.1 The information gathered has allowed habitats to be categorised as either low or high potential. All areas assessed as being of low potential will not need further targeted surveys.

4.1.2 It is recommended that those categorised as having high potential should be subject to further surveys if they are to be impacted directly or indirectly by the development proposal, with the exact methods tailored to suit the likely species composition of the assemblage. The recommendations presented in the Table 4-1 below are in line with current best practice guidance (Drake *et al.*, 2007).

**Table 4-1 Further surveys (if required)**

AREA	HABITAT	METHOD	TIMING	SURVEY FOCUS
1 & 2 (and adjacent hay meadow - TN4)	Wet meadow and hay meadow	Sweep netting / beating	Minimum of two surveys covering spring and summer	Pitfall traps will be deployed on up to two occasions in late spring and summer for a period of 10 – 14 days on each occasion. The surveys will focus on Coleoptera, Hemiptera and Orthoptera (grasshoppers & crickets)
3	Grassland and scrub/ woodland edge	Minimum of two surveys covering spring and summer	Minimum of two surveys covering spring and summer	Pitfall traps will be deployed on up to two occasions in late spring and summer for a period of 10 – 14 days on each occasion. The surveys will focus on Coleoptera, Hemiptera and aculeate Hymenoptera (bees, ants and wasps)
4	Grassland and scrub/ woodland edge	Sweep netting / beating Pitfall traps Pan traps	Minimum of two surveys covering spring and summer	Pitfall traps will be deployed on up to two occasions in late spring and summer for a period of 10 – 14 days on each occasion. The surveys will focus on Coleoptera, Hemiptera and aculeate Hymenoptera.
5	Hedgerow and lane verges	Sweep netting / beating Pitfall traps Pan traps	Minimum of two surveys covering spring and summer	Pitfall traps will be deployed on up to two occasions in late spring and summer for a period of 10 – 14 days on each occasion.

AREA	HABITAT	METHOD	TIMING	SURVEY FOCUS
				The surveys will focus on Coleoptera, Hemiptera, Orthoptera and aculeate Hymenoptera.

# 5 CONCLUSIONS

- 5.1.1 Whilst the majority of the Survey Area comprises intensively managed arable farmland largely unsuitable for notable invertebrate assemblages, there are several parts of the Survey Area that have the potential to support species and assemblages of conservation importance. These areas comprise wet meadow and grassland associated with scrub, woodland and hedgerows.
- 5.1.2 Areas 1 and 2 currently lie outside the proposed working footprint, and therefore further surveys, are not likely to be necessary unless the development proposals change. However, the north-eastern margin of Area 1 supports habitats associated with existing drainage ditches which are likely to be of high potential for invertebrates. Therefore should impacts to the banks of the A34 be impacted upon, further surveys will be required.
- 5.1.3 The further surveys recommended for Areas 3, 4 and 5 (where these areas are affected by the Proposed Works) and will inform the likely impacts of the scheme on the invertebrate assemblages present. These are likely to require at least two visits to covering both spring (typically early April to mid-June) and summer (typically late June to early September).

## BIBLIOGRAPHY

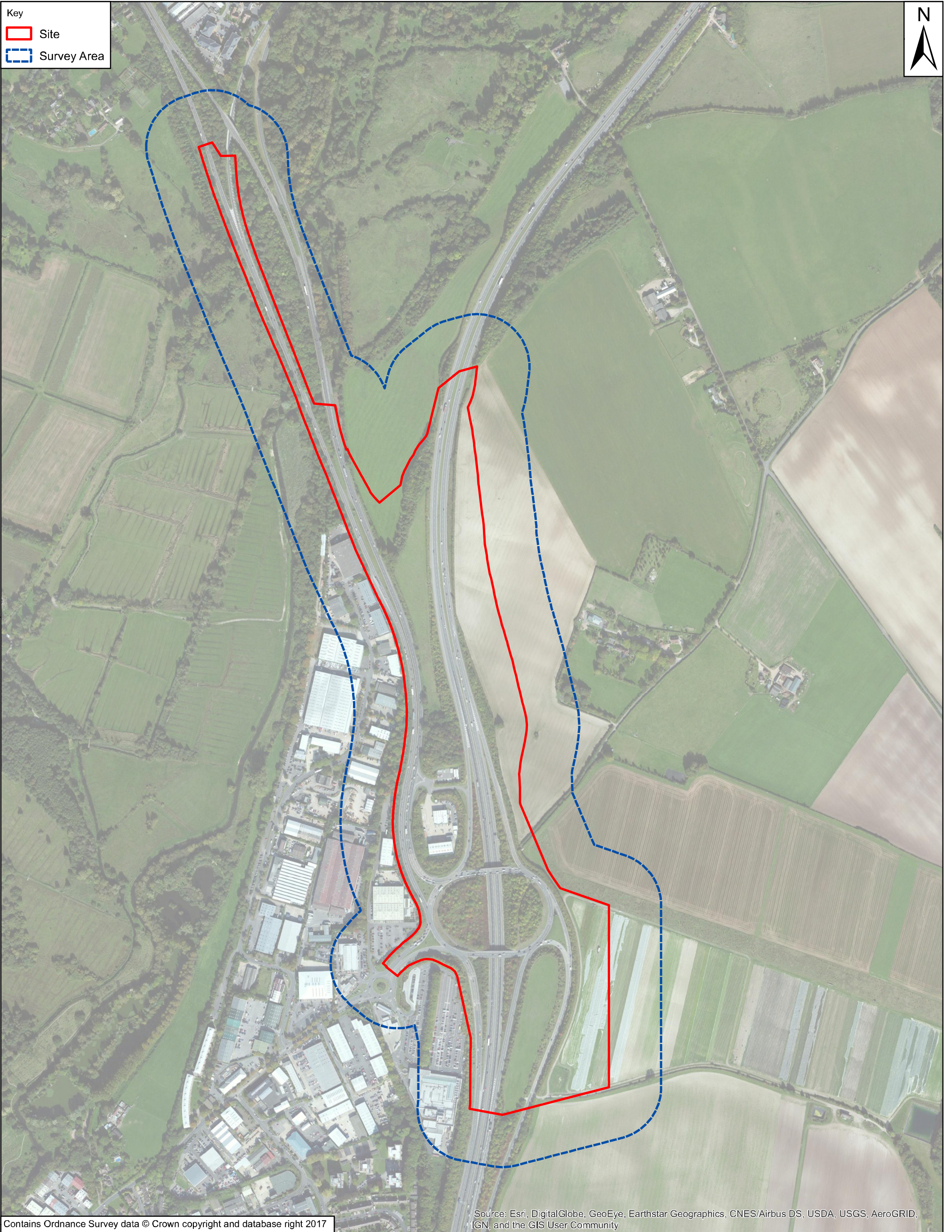
- Drake, C. M., Lott, D. A., Alexander, K. N. A. & Webb, J. (2007) Natural England Research Report NERR005: Surveying terrestrial and freshwater Invertebrates for conservation evaluation. Natural England.



Key

 Site

 Survey Area



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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





REV	DATE	BY	DESCRIPTION	CHK	APP
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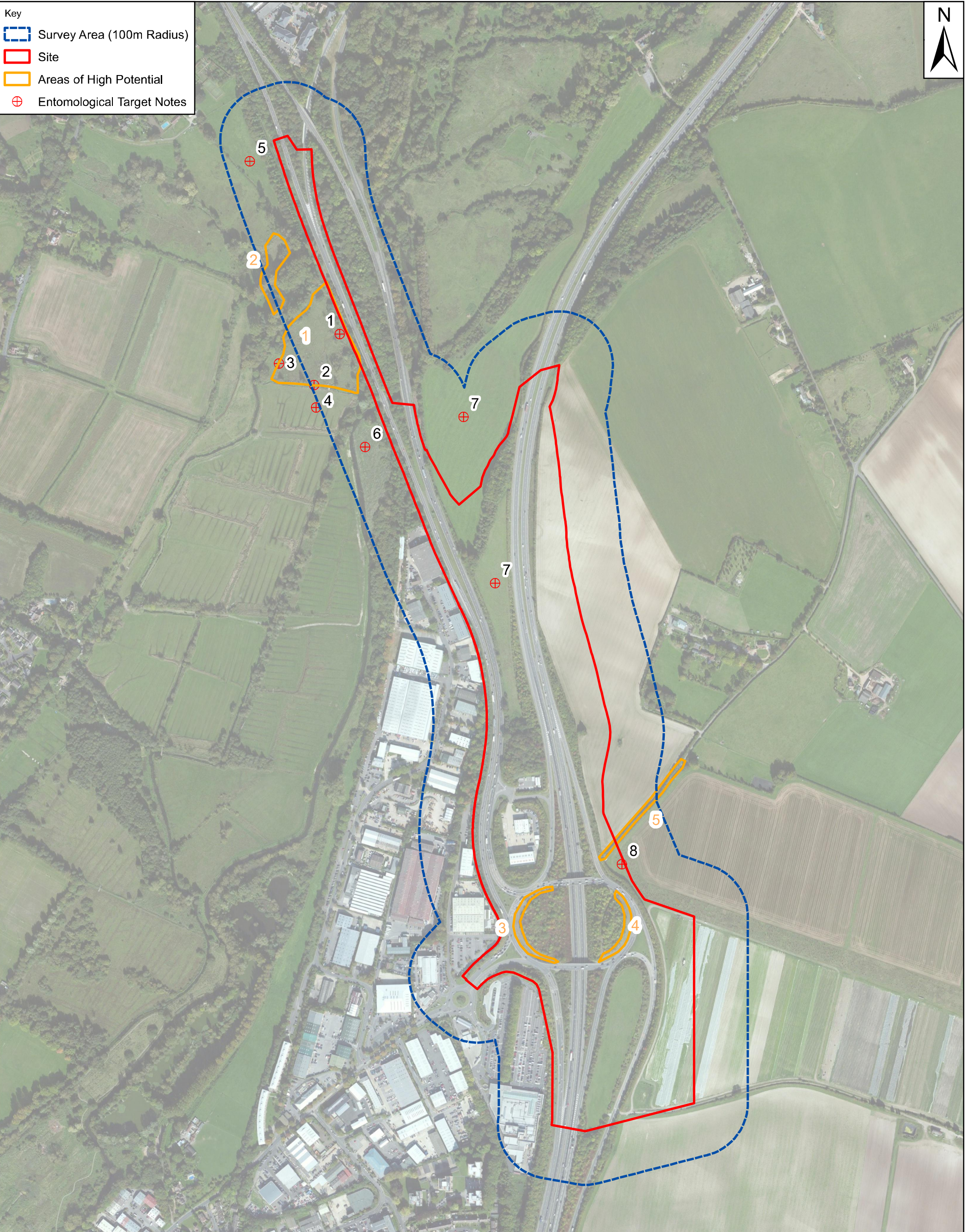



PROJECT: M3 Junction 9

TITLE: Site Location Plan

SCALE @ A3: 6,500	CHECKED: LR	APPROVED: HS
FILE: A3 Template	DRAWN: BW	DATE: August 2017
PROJECT No: 70016638	DRAWING No: 1	REV: A
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Key	
	Survey Area (100m Radius)
	Site
	Areas of High Potential
	Entomological Target Notes



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REV	DATE	BY	DESCRIPTION	CHK	APP
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TITLE:	Entomological Survey Results

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