

M3 Junction 9 Improvement

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6.3 Environmental Statement Appendix 8.1c - Botanical Survey Report 2017

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BOTANICAL SURVEY REPORT

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

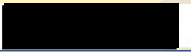
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EXECUTIVE SUMMARY

M3 Junction 9 has been highlighted as requiring redevelopment in order to help reduce congestion. This will be achieved by improving the flow of traffic and three options are currently being considered for implementation (hereafter 'the Proposed Works').

An ecological desk study and Phase 1 habitat survey were undertaken by WSP in 2016 and 2017 respectively, which identified the presence or potential presence of notable plant species and habitats within *the Site* (*i.e.* the anticipated maximum extent of the works area) and *the Survey Area* (*i.e.* a 250m radius around the Site).

In order to investigate the potential for notable plant species and habitats to be negatively affected by the Proposed Works, a botanical survey was carried out. The botanical survey focused on those habitats within or close to the Site which are most likely to be directly affected by the Proposed Works. A variety of approaches were utilised including visual searches, National Vegetation Classification (NVC) survey and hedgerow surveys.

The botanical survey identified the presence of two notable plant species (greater butterfly orchid and white helleborine) occurring on the verge of the M3 (outside of the Site) and broadleaved woodland (including one location within the Site), respectively. Both species are listed on the National Red Data book as being vulnerable to extinction but are relatively widespread in the local area. White Helleborine is a Species of Principal Importance (SPI) for the conservation of Biodiversity under the Natural Environment and Rural Communities (NERC) Act (2006). Neither species receives specific legal protection.

The NVC survey concluded that the surveyed grasslands represent atypical examples of widespread grassland communities, MG1 *Arrhenatherum elatius* grassland and MG6 *Lolium perenne-Cynosurus cristatus* grassland. None of the grasslands are considered to represent examples of Habitats of Principal Importance (HPI), though some of the stands contain a relatively high diversity of species. No notable or legally protected species were identified within the grassland habitats.

Four hedgerows were surveyed of which two are considered to be 'Important' as defined under the Hedgerow Regulations (1997); these hedgerows would be directly affected by two of the three design options under consideration. All hedgerows are considered to be HPI.

A preliminary assessment was made of the conservation value of the surveyed habitats in accordance with good practice guidelines (CIEEM, 2016). They are all considered to be of Local value, with the exception of the grassland within Easton Down Site of Importance for Nature Conservation (SINC). It is located to the north of the Site and may be of value at up to the County Scale, although the grassland is of limited interest.

Under a range of local and national planning policy, development is expected to avoid impacts to habitats and species of conservation value and achieve biodiversity net-gain where possible. In addition, under the NERC Act (2006) all public bodies must have regard to the conservation of biodiversity in exercising their functions, with SPI and HPI identified in order to guide them in fulfilling this duty. Accordingly recommendations have been made for mitigation and compensation/enhancement measures, including:

- Translocating colonies of notable plants species affected by the Proposed Works and reusing associated topsoil in habitat creation
- Replacing hedgerows lost to the Proposed Works on at least a like for like basis
- Consideration given to translocating sections of Important hedgerow affected by the Proposed Works

- Including the creation of ecologically valuable habitats within development proposals including species rich grassland
- Enhancing retained habitats such as Easton Down SINC which is in poor ecological condition due to lack of management

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

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). A large volume of traffic currently uses the interchange (approximately 6,000 vehicles per hour during the peak periods), which acts as a bottleneck on the local and strategic highway network, causing significant delays. 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 Three options have been taken forward to Project Control Framework (PCF) Stage 2 and assessed within this report, namely:

- Option 14: Northbound and Southbound A34 Free Flow Design
- Option 16B: Incremental Delivery – Northbound A34 Free Flow Link
- Option 16C: Incremental Delivery – Southbound A34 Free Flow Design

1.1.3 The works are hereafter referred to as the 'Proposed Works'. Further details of the Proposed Works are presented within the PCF Stage 2 Environmental Assessment Report (EAR) (HE551511-WSP-GEN-M3J9PCF2-RP-LE-00041). The anticipated maximum extent of the works is shown on Figure 8.1, and is hereafter referred to as 'the Site.' An ecological Survey Area has been defined comprising land within 250m of the Site.

1.2 ECOLOGICAL BACKGROUND

1.2.1 An ecological desk study was carried out with respect to the Proposed Works in 2016 (WSP, 2016). This identified the presence of HPI within the vicinity of Junction 9 in addition to records of notable plant species from grid squares that overlap with the Site.

1.2.2 Three designated Sites occur within the Survey Area (see WSP, 2016) In order to give context to this report a brief summary of these designated sites in relation to the Site:

- The River Itchen passes underneath the A34 and A33 roads in the north of the Site, flowing in a south-westerly direction. The river channel is designated at a European level as a Special Area of Conservation (SAC) and at a national level as a Site of Special Scientific Interest (SSSI). The extent of SSSI designated land is broader, extending into floodplains associated with the river. These sites are both designated in part due to their important botanical communities. The Site boundary only overlaps with the edge of these designated sites and they should not be directly affected by the Proposed Works. Detailed consideration of the potential for effects (direct or indirect) upon the SAC will be provided within a Habitats Regulations Assessment accompanying the EAR and they are not considered further within this report.
- Easton Down SINC is designated at a local level on the basis of the presence of relict unimproved calcareous grassland. It is located just to the north of the Site boundary.
- The distribution of these sites is shown on Figure 8.2.

1.2.3 A Phase 1 habitat survey was carried out of a Survey Area comprising the Site plus a 250m buffer, with field visits largely carried out during March and April (WSP, 2017). As this is outside of the optimal period for botanical survey in grassland habitats, grasslands within and close to the Site have been included within the botanical survey.

1.3 BRIEF AND OBJECTIVES

1.3.1 WSP were commissioned to:

- Undertake botanical surveys (including a combination of hedgerow surveys, NVC and visual searching for rarer species in suitable habitat areas)
- Provide a concise technical report setting out the survey methods used, reporting the survey results, and providing outline recommendations in relation to the project and botanical communities and species (with reference to relevant legislation and planning policy)

2 METHODS

2.1 OVERVIEW

2.1.1 Data gathered during the desk study and Phase 1 habitat survey were used to devise an appropriate suite of surveys to gather detailed botanical data regarding habitats within the Site.

2.2 VISUAL SEARCHES

WOODLAND HABITATS

2.2.1 The Phase 1 habitat survey was undertaken during March and April 2017, with additional visits made to the woodland habitats during May and June by the surveyors during which time observations were made regarding woodland flora. These visits span the optimal survey period for surveying woodland ground flora.

2.2.2 The Phase 1 habitat survey report (WSP, 2017) contains notes regarding each woodland parcel including details of woodland habitat structure and flora recorded. The woodlands within the Site comprise a mixture of young plantation woodland and secondary woodland that has predominantly developed on the remnants of a disused railway cutting that traverses the Site. Whilst it was not considered that woodland habitats warranted detailed botanical assessment, incidental records of a notable species were made during the course of ongoing survey work and are detailed within this report.

GRASSLAND ON THE M3 VERGE

2.2.3 The verges of the M3 largely comprise semi-improved calcareous grasslands. A species list was compiled of grassland species present during multiple visits made under traffic management between May and August 2017.

2.2.4 The DAFOR scale was used to indicatively assess the relative abundance of plant species recorded within surveyed habitats, as follows:

- D: Dominant
- A: Abundant
- F: Frequent
- O: Occasional
- R: Rare

2.2.5 Additionally, the prefix 'L' is used to denote a species with a markedly local distribution.

2.3 NVC SURVEY

2.3.1 The NVC was carried out in accordance with the following best practice survey guidance:

- National Vegetation Classification: Users' Handbook (JNCC, 2008)
- British Plant Communities: Volume 3 – Grasslands and montane communities (Rodwell, 1992)
- Review of coverage of the National Vegetation Classification. Joint Nature Conservation Committee Report No. 302 (Rodwell et al., 2000)

2.3.2 Four stands of grassland were selected for further assessment due to their proximity to the Site and because the Phase 1 habitat survey was undertaken outside of the optimal period for botanical assessment of grassland habitats. They are detailed within Table 2-1 below and their distribution can be seen on Figure 8.3.

Table 2-1: Grassland selected for further survey

HOMOGENOUS STAND OF GRASSLAND (PHASE 1 HABITAT CODE (SEE WSP, 2017))	DESCRIPTION/NOTES
SI3	Unmanaged grassland within Easton Down SINC
SCG15	Area of pasture between the M3 and A34
SCG16	Area of pasture between the M3 and A34
PMW/SI1	Area of grassland occurring amongst an area of recently planted woodland east of Winnal Roundabout

2.3.3 The surveyor carried out an initial walk-over of each of the areas of grassland to confirm that they could be considered as homogenous stands of vegetation. A quadrat size of 2 metres (m) x 2 m was selected as appropriate to sample the range of variation present in each stand of grassland. Five quadrat samples were then collected from each stand of vegetation. Quadrat locations were selected to sample all parts of a parcel, whilst avoiding areas which did not conform to the typical stand type within the parcel, for example areas in close proximity to hedgerows, where additional non-typical species may extend into the parcel, or where nutrient enrichment as a result of grazing localised is evident. The quadrat locations were indicatively annotated upon a plan of the Site.

2.3.4 Within each quadrat, all species of higher plant were recorded with the percentage cover for each plant species was estimated according to the *Domin* scale (see Table 2-2 below).

Table 2-2: The Domin Scale

DOMIN VALUE	COVER
1	<4% Rare
2	<4% Occasional
3	<4% Frequent
4	4-10%
5	11-25%
6	26-33%
7	34-50%
8	51-75%
9	76-90%
10	91-100%

2.3.5

Data were collated in floristic tables and frequency values were calculated. Frequency values describe how often a species is encountered in different stands or samples of a vegetation type, irrespective of the abundance of that species is present in each stand or sample. It is summarised in floristic tables using the Roman numerals I-V and referred to in descriptions of vegetation types using the terms listed in Table 2-3 below.

Table 2-3: Vegetation frequency class

FREQUENCY CLASS	RANGE OF FREQUENCY CLASS	TERMS USED TO DESCRIBE FREQUENCY CLASS
I	1-20% (i.e. appears in 1 quadrat sample in 5)	Scarce
II	21-40%	Occasional
III	41-60%	Frequent
IV	61-80%	Constant
V	81-100%	Constant

2.3.21

This information was then used in conjunction with the key in British Plant Communities Volume 3 Grassland and Montane Communities to assign the most closely corresponding NVC community type based on the abundance and frequency of plant species within each plot. The computer software MAVIS (Modular Analysis of Vegetation Information System) by the Centre for Ecology and Hydrology was used to produce 'matching coefficients' indicating the confidence level by which field data matches data published in British Plant Communities.

2.3.22 As a result of the variation in natural plant communities and the fact that NVC communities are based on average species composition considering numerous samples from across the UK; it is rare for a matching coefficient for any individual stand of vegetation to exceed 0.6 (60% similarity to the published NVC communities). For this reason also, MAVIS analysis is rarely conclusive. The final decision as to which NVC community a stand of vegetation relates to must be made using the results of MAVIS analysis alongside published community descriptions in Rodwell (1992) and surveyor experience.

2.4 ECOLOGICAL SURVEY OF HEDGEROWS

2.4.1 Four species rich hedgerows (as defined within JNCC 2010) were selected for further surveys. These comprised all of the hedgerows within the Site that which were not dominated by one species during the Phase 1 habitat survey (WSP, 2017). These are described in Table 2-4 below and displayed on Figure 8.3. These were subject to further survey in order to establish whether they qualified as 'Important Hedgerows' under the Hedgerow Regulations 1997 (hereafter referred to as 'the Regulations').

Table 2-4: Hedgerows selected for survey

HEDGEROW REFERENCE (SEE WSP, 2017)	APPROXIMATE LENGTH	DESCRIPTION
RHT1 (Easton Lane south)	180m	Heavily flailed hedgerow with small number of <i>Acer</i> sp. trees. c. 1m x 1m (w, h)
RHT4 (Easton Lane north)	200m	Mature hedgerow north of Easton Lane, c. 2m x 4m (w, h).
PHT5 (Easton Down south)	220m	Established hedgerow with mature trees along the A34. c 3m x 4m (w, h).
RHT5 (Easton Down north)	320m	Dense mature hedgerow c. 3m x 4m (w, h) with some mature trees present.

2.4.2 In accordance with the Regulations the hedgerows were measured from the point or points where they met another hedgerow(s) or where there was a gap of more than 20 metres between the end of the hedgerow and the nearest line of hedgerow. Gaps within a hedgerow were included in the total length provided they were 20 metres or less in length.

2.4.3 Notes were made on the following in accordance with the criteria outlined in Schedule 1, Part II of the Regulations:

- Number of woody species, on average, in a 30 metre length
- Presence of rare tree species such as black poplar *Populus nigra ssp. betulifolia*, large-leaved lime *Tilia platyphyllos* and small-leaved lime *Tilia cordata* and wild service tree *Sorbus torminalis*
- Number of standard trees, on average, within each 50 metre section
- Number of gaps in the hedge
- Presence of woodland ground flora species listed in Schedule 2 of the Regulations
- Presence of ditches, banks or walls
- Number of connections with other hedgerows, ponds or woodland
- Presence of parallel hedges within 15 metres of the hedge
- Presence of bridleways, footpaths, byways or public paths

2.4.4 In accordance with the Regulations the number of woody species present per 30 metre length was recorded in the following manner:

- Where the length of the hedgerow did not exceed 30 metres, the total number of woody species present in the hedgerow was recorded
- Where the hedgerow was between 30 metres and 100 metres in length, the number of woody species present in the central 30 metre stretch was recorded
- Where the hedgerow length was between 100 metres and 200 metres, the number of woody species present in the central 30 metre stretches of the two halves of the hedgerow were recorded and the mean of the two calculated
- Where the length of the hedgerow was over 200 metres, the numbers of woody species present in the central 30 metre stretch of each third of the hedgerow were recorded and the mean of

the three calculated

2.4.5 With regard for the Hedgerow Survey Handbook (2nd Edition) (DEFRA, 2007) further details, not required under the Regulations, such as hedgerow height, width, integrity, structure, and management history were recorded.

2.4.6 The field survey information was then assessed to establish whether each hedge fulfilled the Wildlife and Landscape criteria within the Regulations.

2.5 EVALUATION

2.5.1 The results of the above surveys were used to provide a preliminary valuation of conservation value using the CIEEM guidance (CIEEM, 2016). This guidance recommends that valuation of nature conservation importance is made with reference to a geographical framework, e.g. a site is of local, district, county, regional or national value.

2.5.2 The following sources of reference were used to inform the evaluation:

- Criteria for Selecting Sites of Importance for Nature Conservation in Hampshire HCC, 1996); Habitat of Principal Importance definitions listed by Maddock (2011)
- Hampshire Local Biodiversity Action Plan (LBAP)
- The Vascular Plant Red Data List for Great Britain (Cheffings *et al.* 2005)
- Hampshire Rare Plant Register (Rand & Mundell, 2011)

2.6 DATES OF SURVEY AND PERSONNEL

2.6.1 The botanical survey was completed by an Associated Member of the Chartered Institute for Ecology and Environmental Management with WSP who has over 6 years' experience of ecological survey. This includes extensive experience of habitat surveys on a variety of sites across the UK and holds a Field Studies Identification Certificate at Level 4 which is recommended by the Botanical Society of Britain and Ireland as the competence threshold for NVC survey.

2.6.2 Visual searches were undertaken throughout spring in summer during multiple visits to the Site to complete a variety of ecological surveys. The hedgerow and NVC surveys were carried in late August 2017. The weather conditions were dry and fine and were not a constraint to the Survey. August is within the optimal period for botanical survey of grassland when a large proportion of species are in flower and readily identifiable.

2.7 NOTES AND LIMITATIONS

VISUAL SEARCHES

2.7.1 The visual searching was undertaken on an *ad-hoc* basis. This is considered appropriate due to the nature of the habitats present which are comparatively recent in origin or disturbed by adjacent land uses.

2.7.2 Some of the embankments to the M3 are very steep and not accessible for health and safety reasons. Whilst the species lists collated with respect to these habitats may not comprise a complete inventory of species present, it is considered that sufficient information has been gathered to make an informed evaluation of habitat value.

NVC SURVEYS

- 2.7.3 The NVC surveys were completed in late August which is within the optimal season for grassland survey and therefore considered sufficient to gain an understanding of the botanical value of these habitats. It should be noted that botanical survey of grasslands is seasonally limited; some species such as soft brome *Bromus hordeaceus* and sweet vernal grass *Anthoxanthum odoratum* flower early in the season, whilst others, such as bents *Agrostis* spp. flower later in the summer. Whilst early flowering species will still be present within the sward later in the season it is likely the perception of dominance will change, whilst late flowering species may not be noticeable early in the season. Therefore, there is no one time at which it is optimal to complete grassland surveys and any survey will always be a snapshot of the condition of a grassland, with perception of species dominance potentially changing dependent upon the seasonal timing of the survey.

HEDGEROW SURVEYS

- 2.7.4 One qualifying criterion within the Hedgerow Regulations 1997 relates to whether the hedgerow in question supports protected species and, or species of conservation concern. It is not possible to establish the presence or likely absence of all protected species within one visit. Therefore information relating to protected species within the hedgerows has been excluded from this assessment. Further surveys for legally protected species which may be associated with hedgerows have been recommended as separate assessments of the Site and are not reported within this document.
- 2.7.5 Only Wildlife and Landscape criteria of the Regulations were considered within this assessment. Therefore, it is possible hedgerows which do not qualify as 'important hedgerows' under these criteria may still qualify under archaeology and history criteria.
- 2.7.6 All hedgerows on the Site are believed to be over 30 years old. Therefore, for the purpose of this assessment all hedgerows have been considered as though subject to the Regulations.
- 2.7.7 The hedgerow surveys were undertaken in late-August and as such woody species were readily identifiable. However, some woodland specialist species are only evident during spring and as such may not have been recorded during this survey. It was possible to make a robust assessment of whether hedgerows qualify as Important under the regulations and make a robust evaluation of their nature conservation value.

3 RESULTS

3.1 VISUAL SEARCHES

WOODLAND HABITATS

3.1.1 The ground flora of the woodland areas within the Site is generally comprised of common and widespread species such as bramble *Rubus fruticosus* agg. and nettle *Urtica dioica*. However, one notable species, white helleborine *Cephalanthera damasonium* was recorded as detailed within Table 3-1 below and Figure 8.3.

Table 3-1 Notable plan species recorded within woodland area

SPECIES	CLASSIFICATIONS	LOCATION
White helleborine <i>Cephalanthera damasonium</i>	<ul style="list-style-type: none"> → SPI for the conservation of biodiversity under the Natural Environment and Rural Communities Act (2006). → National status: Vulnerable, not scarce. → Local status: Not ranked (not rare) 	Recorded in two of the woodlands occurring close to and within the Site respectively, at SU4951 3075 and SU 49599 30810 (see Figure 8.3). Several individuals were observed in these locations.

GRASSLAND ON THE M3 VERGE

3.1.3 The verges of the M3 comprise varying extents of grassland habitat ranging between around 1m wide up to around 4m wide. The grassland occurs in mosaic with scrub with ivy *Hedera helix* dominant in places. Beyond the grassland, the verges are bound by hedgerows or plantation woodland. Extensive cuttings with steep banks occur along most of the verge. The verges are thought to date from the construction of the motorway during the 1980s.

3.1.4 A total of 44 species were recorded on the western verge of the M3 and 49 species were recorded on the eastern verge, which includes more extensive areas of grassland. The species lists are included within Appendix A. The species recorded are characteristic of infrequently managed coarse grassland on calcareous soils. One notable plant species was recorded, as detailed within Table 3-2 below and on Figure 8.3.

Table 3-2 Notable plant species recorded on the M3 verge

SPECIES	CLASSIFICATIONS	LOCATION
Greater butterfly-orchid <i>Platanthera chlorantha</i>	<ul style="list-style-type: none"> → National status: Vulnerable, not scarce. → Local status: Not ranked (not rare) 	Recorded in one location on the eastern verge of the M3 outside of the Site (SU 49715 31668, see Figure 8.3).

EVALUATION

3.1.5 With respect to the woodland habitats, the presence of white helleborine, a widespread species of some conservation concern, means that the woodlands should be valued at least local importance.

3.1.6 With respect to the verges of the M3, these support a relatively high diversity of species, including one species listed as nationally vulnerable to extinction, although is relatively widespread in the local area. The grasslands will provide foraging opportunities to a range of fauna, particularly invertebrates. The verges are a relatively recently created habitat and one that can be readily recreated. Overall they are considered to be of value at up to the local scale.

3.2 NATIONAL VEGETATION CLASSIFICATION SURVEY

3.2.1 Frequency tables for each grassland parcel are presented in Appendix B. Figure 8.3 shows the location of each of the surveyed grassland parcels and the location of quadrat samples. Photographs of grassland parcels are also shown in Appendix B.

3.2.2 Table 3-3 presents the findings of the NVC survey and an evaluation of the nature conservation importance of each of the surveyed grasslands in the Site.

Table 3-3: NVC Survey Results

STAND	AREA (HA)	NUMBER OF SPECIES RECORDED	MAVIS NVC COEFFICIENTS	DESCRIPTION AND ANALYSIS	ASSESSMENT OF CONSERVATION VALUE
SI3	0.05ha	17	MG1b 53.99 OV24 46.64 OV24b 44.39 MG1a 42.92 S26b 41.79	<p>This stand comprises unmanaged, rank, overgrown grassland that is dominated by the coarse grass false-oat grass <i>Arrhenatherum elatius</i>. It is located on a relatively steep slope and is fenced off from the adjacent cattle grazed pastures. Salad burnet <i>Sanguisorba minor</i>, a species characteristic of less-improved calcareous grassland, occurred in one quadrat. This probably indicates that historically the grassland was an unimproved or semi-improved calcareous grassland which has succeeded to rough grass with the cessation of grazing.</p> <p>The closest match from MAVIS analysis was for MG1b <i>Arrhenatherum elatius</i> grassland, <i>Urtica dioica</i> sub-community. Review of Rodwell (1992) indicates that this is an appropriate classification. MG1 grasslands are characteristic of ungrazed grasslands, representing a temporary stage in succession to scrub and woodland.</p>	<p>The stand forms a significant part of the Easton Down SINC, which is designated as it met the criteria '<i>Grasslands which have become impoverished through inappropriate management but which retain sufficient elements of relic unimproved grassland to enable recovery</i>'. Given the lack of species present, the grassland itself is considered to be of no more than local value. However, it forms part of a wider SINC which it is appropriate to value on a county level.</p>

STAND	AREA (HA)	NUMBER OF SPECIES RECORDED	MAVIS NVC COEFFICIENTS	DESCRIPTION AND ANALYSIS	ASSESSMENT OF CONSERVATION VALUE
SCG15	1.5ha	35	OV23 40.85 MG6a 40.64 MG6 39.54 MG7E 39.36 MG11a 39.18	<p>This stand comprises a relatively herb-rich cattle grazed pasture. Whilst it has been treated as a homogenous stand some variation was observed including an area of wet ground in the north of the parcel (which was excluded from sampling). In addition, it was noted that peripheral areas tended to be more herb-rich than central areas. It is considered that sampling captured this variation.</p> <p>The strongest MAVIS coefficient was for OV23 <i>Lolium perenne</i> - <i>Dactylis glomerata</i> community though with a relatively weak coefficient. OV23 is described as a coarse weedy grassland characteristic of resown recreational areas such as play grounds and institutional grounds. Whilst the stand clearly bears some resemblance to this community, given the land use MG6 <i>Lolium perenne</i>-<i>Cynosurus cristatus</i> grassland is considered to be a more appropriate classification. MG6 is the characteristic improved pasture community. It is noted that the stand is significantly more species rich than the typical community is detailed within Rodwell (2006), with a lower cover and frequency of <i>Lolium perenne</i>. It is likely that the grassland has a history of agricultural improvement but is gradually reverting to a more species rich community. Historical disturbance and/ or reseeding could account for the poor fit to NVC communities with a broad range of species present including ruderal species such as bristly ox-tongue <i>Helminthotheca echioides</i> and those characteristic of calcareous conditions such as marjoram <i>Origanum vulgare</i>.</p>	<p>This grassland contains a reasonable diversity of herbaceous vegetation which will provide resources for a range of invertebrates and associated fauna. It is formed of common and widespread species. The habitat type is reasonably widespread in the local area and can readily be recreated. It does not meet criteria to qualify as a SINC or HPI. Overall, it is considered appropriate to value the stand as of importance on a local level.</p>

STAND	AREA (HA)	NUMBER OF SPECIES RECORDED	MAVIS NVC COEFFICIENTS	DESCRIPTION AND ANALYSIS	ASSESSMENT OF CONSERVATION VALUE
SCG16	6.3	22	MG11a 48.87 MG11 45.16 MG7B 43.15 MG6 41.93 MG6c 41.70	<p>This stand is similar in nature to SCG15 to which it is adjacent, though less species rich. Some variation occurs across the stand likely relating to the sloped nature of the habitat parcel.</p> <p>The strongest coefficient was for MG11 <i>Festuca rubra</i>- <i>Agrostis stolonifera</i>- <i>Potentilla anserina</i> grassland, a community characteristic of free draining soils that are frequently inundated. This may be appropriate for the lower lying parts of this stand, but overall it is considered that the stand is best described by MG6 <i>Lolium perenne</i>-<i>Cynosurus cristatus</i> grassland, albeit an atypical fit. Differences could be due to historical disturbance and/ or land uses. For example it is reasonably likely that these fields will have been used for arable production at some stage in the past. The diversity of species present indicates the residual fertility soil is declining.</p>	As for SCG 15- Local value
PMW/SI1	1.6	22	MG1a 46.28 MG1b 46.08 MG1 37.13 OV25b 36.20 MG9b 36.18	<p>This stand comprises a relatively diverse area of grassland which is not obviously managed. The grassland is located to the periphery of arable fields and it likely to be relatively recent in origin. The grassland occurs amongst recently planted trees.</p> <p>The strongest match from MAVIS analysis was for MG1a <i>Arrhenatherum elatius</i> grassland, <i>Festuca rubra</i> sub-community, which is considered to be an appropriate classification for this stand.</p>	

3.3 ECOLOGICAL SURVEY OF HEDGEROWS

- 3.3.1** Of the four hedgerows surveyed, two qualify as 'Important Hedgerows' under the Wildlife and Landscape criteria of the Regulations. They qualify largely due to their position adjacent to a public right of way located on Easton Lane.
- 3.3.2** These hedgerows are considered to be of local nature conservation value on the basis that they constitute important ecological features providing resources and habitat connectivity to a range of flora and fauna. Hedgerows of this sort are likely to be widespread in the surrounding landscape.
- 3.3.3** The results are summarised within Table 3-4 below. Hedgerow locations are shown on Figure 8.3 and survey data is included within Appendix C.

Table 3-4: Hedgerow Survey Results

PHASE 1 HEDGEROW REFERENCE		PHASE 1 CLASSIFICATION	PHASE 1 DESCRIPTION	EVALUATION OF HEDGEROW IMPORTANCE UNDER THE WILDLIFE AND LANDSCAPE CRITERIA OF THE REGULATIONS					
				7 woody species	6 woody species and 3 associated features	6 woody species, including black poplar, large leaved lime, small leaved lime, wild service tree	5 woody species and 4 associated features	Is adjacent to a PROW or road or byway and includes 4 woody species and 2 associated features	Important under ecological criteria
RHT1 (Easton Lane south)	Species hedgerow with trees	Heavily flailed hedgerow with small number of Acer sp. trees. c. 1m x 1m (w, h)	N	N	N	N	N	Y	Y
RHT4 (Easton Lane north)	Species rich hedgerow with trees	Mature hedgerow north of Easton Lane, c. 2m x 4m (w, h).	N	N	N	N	N	Y	Y
PHT5 (Easton Down south)	Species poor hedgerow with trees	Mature hedgerow north of Easton Lane, c. 2m x 4m (w, h).	N	N	N	N	N	N	N
RHT5 (Easton Down north)	Species hedgerow with trees	Established hedgerow with mature trees along the A34. c 3m x 4m (w, h).	N	N	N	N	N	N	N

4 LEGISLATIVE AND POLICY FRAMEWORK

4.1 LEGAL COMPLIANCE

WILDLIFE AND COUNTRYSIDE ACT 1981 (AS AMENDED)

- 4.1.1 Under the Wildlife and Countryside Act 1981 (as amended), it is an offence if one: 'intentionally picks, uproots or destroys any wild plant included in Schedule 8'. No such plant species were recorded in the Site.

HEDGEROW REGULATIONS (1997)

- 4.1.2 Under the Hedgerow Regulations it is an offence to remove a hedgerow (as defined within the Regulations) without applying to the local planning authority (LPA) for permission. Should the hedgerow be deemed unimportant according to the criteria within the Regulations the LPA is obliged to allow removal. However, if the hedgerow qualifies as 'Important' under the Regulations the LPA must decide whether the reasons for removal justify the loss of an 'Important Hedgerow', with a presumption for retention. It is not necessary to apply for permission to remove a hedgerow if it is included within a planning application, as will be the case with the Proposed Works. Furthermore, the Hedgerow Regulations stipulate that '*The removal of any hedgerow to which these Regulations apply is permitted if it is required.... for the carrying out by the Secretary of State of his functions in respect of any highway for which he is the highway authority(22) or in relation to which, by virtue of section 4(2) of the Highways Act 1980, he has the same powers under that Act as the local highway authority.*

NATURAL ENVIRONMENT AND RURAL COMMUNITIES ACT 2006

- 4.1.3 The NERC Act 2006 places a duty on all public authorities, including planning authorities, to have regard for the conservation of biodiversity when discharging their duties. The NERC Act refines the definition of biodiversity conservation, stating that it includes restoring or enhancing a population or habitat.
- 4.1.4 Habitats and species of principal importance (HPIs and SPIs) for the conservation of biodiversity in England are listed in accordance with Section 41 of the NERC Act in order to guide public authorities in exercising their duty.
- 4.1.5 Grassland habitats surveyed within this report are not considered to meet the criteria to qualify as HPI, whereas all hedgerows and broadleaved woodlands within the Survey Area are considered to be HPI. Greater butterfly orchid is a SPI.

4.2 PLANNING POLICY

RELEVANT PLANNING POLICY

- 4.2.1 As the project qualifies as a Nationally Significant Infrastructure Project (NSIP), it must adhere to the National Policy Statement (NPS) for National Networks (Department for Transport 2014). This states inter alia that the principals and objectives of the government's 2012 Natural Environment White Paper (NEWP) and Biodiversity 2020 strategy should be adhered to. These promote moving progressively from net biodiversity loss to net gain by supporting healthy, well-functioning ecosystems and establishing more coherent ecological networks that are more resilient to current and future pressures. The NPS also states that the likely significant effects on internationally, nationally and locally designated sites of ecological conservation importance, on protected species and on habitats, on other species identified as being of principal importance for the conservation of biodiversity and that potential impacts on ecosystems should be clearly set out.
- 4.2.2 At the national level the National Planning Policy Framework (NPPF) (2012) forms the basis for planning system decisions with respect to conserving and enhancing the natural environment, including great crested newts. The Office of the Deputy Prime Minister circular 06/2005 also provides supplementary guidance, including confirmation that *'the presence of a protected species is a material consideration when a planning authority is considering a development proposal'*.
- 4.2.3 The NPPF sets out, amongst other points, how at an overview level the *'planning system should contribute to and enhance the national and local environment by:*
- *...recognising the wider benefits of ecosystem services*
 - *minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures...'*
- 4.2.4 A list of principles which local planning authorities should follow when determining planning applications is included in the NPPF, and includes the following:
- *'- if significant harm resulting from a development cannot be avoided...adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused*
 - *- ...opportunities to incorporate biodiversity in and around developments should be encouraged*
 - *- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland...unless the need for, and benefits of, the development in that location clearly outweigh the loss...'*
- 4.2.5 At a local level, Winchester City Council and the South Downs National Park have adopted the Winchester District Local Plan Part 1 (Adopted 2013). Chapter 9 is entitled 'High Quality Environment' with policy CP16 entitled *Biodiversity*. This states *'The Local Planning Authority will support development which maintains, protects and enhances biodiversity across the District, delivering a net gain in biodiversity, and has regard to the following:*
- *protecting sites of international, European, and national importance, and local nature conservation sites, from inappropriate development. supporting habitats that are important to maintain the integrity of European sites*
 - *new development will be required to show how biodiversity can be retained, protected and enhanced through its design and implementation, for example by designing for wildlife, delivering BAP targets and enhancing Biodiversity Opportunity Areas*
 - *new development will be required to avoid adverse impacts, or if unavoidable ensure that impacts are appropriately mitigated, with compensation measures used only as a last resort*

- *Development proposals will only be supported if the benefits of the development clearly outweigh the harm to the habitat and/or species*
- *maintaining a District wide network of local wildlife sites and corridors to support the integrity of the biodiversity network, prevent fragmentation, and enable biodiversity to respond and adapt to the impacts of climate change*
- *supporting and contributing to the targets set out in the District's Biodiversity Action Plan (BAP) for priority habitats and species*
- *Planning proposals that have the potential to affect priority habitats and/or species or sites of geological importance will be required to take account of evidence and relevant assessments or surveys*

5 RECOMMENDATIONS

5.1 OVERVIEW

- 5.1.1 The results of the botanical survey are considered in context of design drawings available at the time of writing and the legal and planning policy context. Outline recommendations for mitigation measures are made for consideration.

5.2 AVOIDANCE AND MITIGATION MEASURES

NOTABLE PLANT SPECIES

- 5.2.1 Review of design drawings indicate one of the white helleborine colonies is likely to be directly affected by all of the route alignments. In order to mitigate these affects the following outline recommendations are made:

- The individual colonies within the affected area could be translocated. This would be achieved by hand digging the orchid colonies, including surrounding topsoil, and moving them to a similar area of habitat in the close vicinity, matching as closely as possible for habitat type.
- This could be supplemented by the collection of seed at an appropriate time of year (indicatively early summer) which would be stored and reseeded in an appropriate location during early spring.
- Subsequent to the translocation of individual colonies, topsoil from the area of woodland supporting this species should be retained and reused within areas of woodland planting within the Proposed Works as it is likely to contain a seedbank that includes white helleborine.
- Following completion of the Proposed Works, monitoring could be implemented and where the above measures were not successful revised attempts could be made using seed gathered from nearby colonies.

- 5.2.2 The identified greater butterfly orchid colony is not likely to be affected by the Proposed Works, though in light of the access limitations the potential for further colonies within the works footprint cannot be ruled out. In the event of colonies being identified within the works footprint, the above mitigation measures should be implemented.

GRASSLAND

- 5.2.3 Grassland within SCG16, SCG16 and PMW/SI1 is likely to be affected to some degree by all of the design options, whilst road verge habitat will also be lost. It is recommended that provision should be made for replacing grassland habitat lost on at least a like for like basis. The following measures are advised with respect to newly created grassland within the Proposed Works:

- Grassland created within the Proposed Works is more likely to develop into a diverse community where soil fertility is kept to a minimum. Accordingly, it is advised that the use of topsoil and fertilizers should be avoided as far as possible.
- Where grassland seed is used, appropriate locally sourced mixes should be used, appropriate for the calcareous soils that characterise the local area.

HEDGEROWS

- 5.2.4 Where possible, it is recommended effects upon hedgerows (in particular 'Important Hedgerows RHT1 and RHT4) are avoided as possible. Review of current design drawings indicates that all of

the Options will affect hedgerows to some degree, whereas options 14 and 16c would directly affect Important Hedgerows RHT1 and RHT4.

- 5.2.5 Where hedgerows are to be retained, the risk of negative effects during the construction phase should be considered and mitigation measures implemented as necessary, for example protection following methods described in BS5837:2012 'Trees in relation to design, demolition and construction – Recommendations'.
- 5.2.6 Where hedgerow retention (in entirety or in part) will not be possible, it is advised the mitigation or compensation measures would be required. These could include replacement planting or hedgerow translocation.
- 5.2.7 Where hedges are replaced by new planting, the new hedgerows should comprise native species of local provenance, with species composition based on those naturally found to be present within hedgerows in the local area, and where possible and appropriate, enhanced to be more species rich than the hedgerows to be lost. Where possible new hedgerows should incorporate bank and ditch features and standard trees.
- 5.2.8 With respect to translocation, which is particularly advised with respect to the Important hedgerows, a detailed mitigation strategy would need to be prepared. In summary, it would include the following methods:
- Translocation should be carried out in Autumn when the soils are warm and moist and new root growth is possible before winter
 - Digging of trenching receptor area immediately prior to translocation to prevent drying out
 - Sectional movement of the hedgerow, retaining as much of the root as possible and retaining thick horizontal sections where possible
 - Placement in receptor trench with careful backfilling to minimise soil compaction
 - Subsequent aftercare, such as replacement planting and watering as appropriate

5.3 OPPORTUNITIES FOR ENHANCEMENTS

- 5.3.1 Grassland within Easton Down SINC (SI3) is under grazed, with a resultant suppression of species diversity. It is likely that the grassland represents relict calcareous grassland, and therefore there is a significant opportunity to restore the grassland to a habitat of greater conservation value here by reintroducing grazing to the SINC and selectively clearing some of the invasive scrub.
- 5.3.2 The Proposed Works could achieve a net-gain in biodiversity, as is promoted by planning policy and guidance by creating sufficient amounts of ecologically valuable habitat to offset those lost to development. This will be explored in detail within the net-gain assessment which will accompany the EAR. These habitats should include hedgerow and grassland creation as detailed above, in addition to other habitats such as wetlands and woodlands. Habitat creation should include native species appropriate to the local area and be designed with regard to strengthening habitat connectivity wherever possible.

6 CONCLUSION

6.1.1

The botanical surveys identified that the surveyed habitats are of conservation value in the local context and therefore mitigation measures should be incorporated into the Proposed Works to ensure compliance with planning policy and guidance. A range of mitigation options are presented for consideration which if pursued should be investigated in greater detail.

7 REFERENCES

7.1 PROJECT REFERENCES

- WSP (2016) M3 Junction 9 Improvement PCF Stage 1. Ecological Desk Study
- WSP (2017) M3 Junction 9 Improvement PCF Stage 2. Phase 1 Habitat Survey

7.2 TECHNICAL REFERENCES

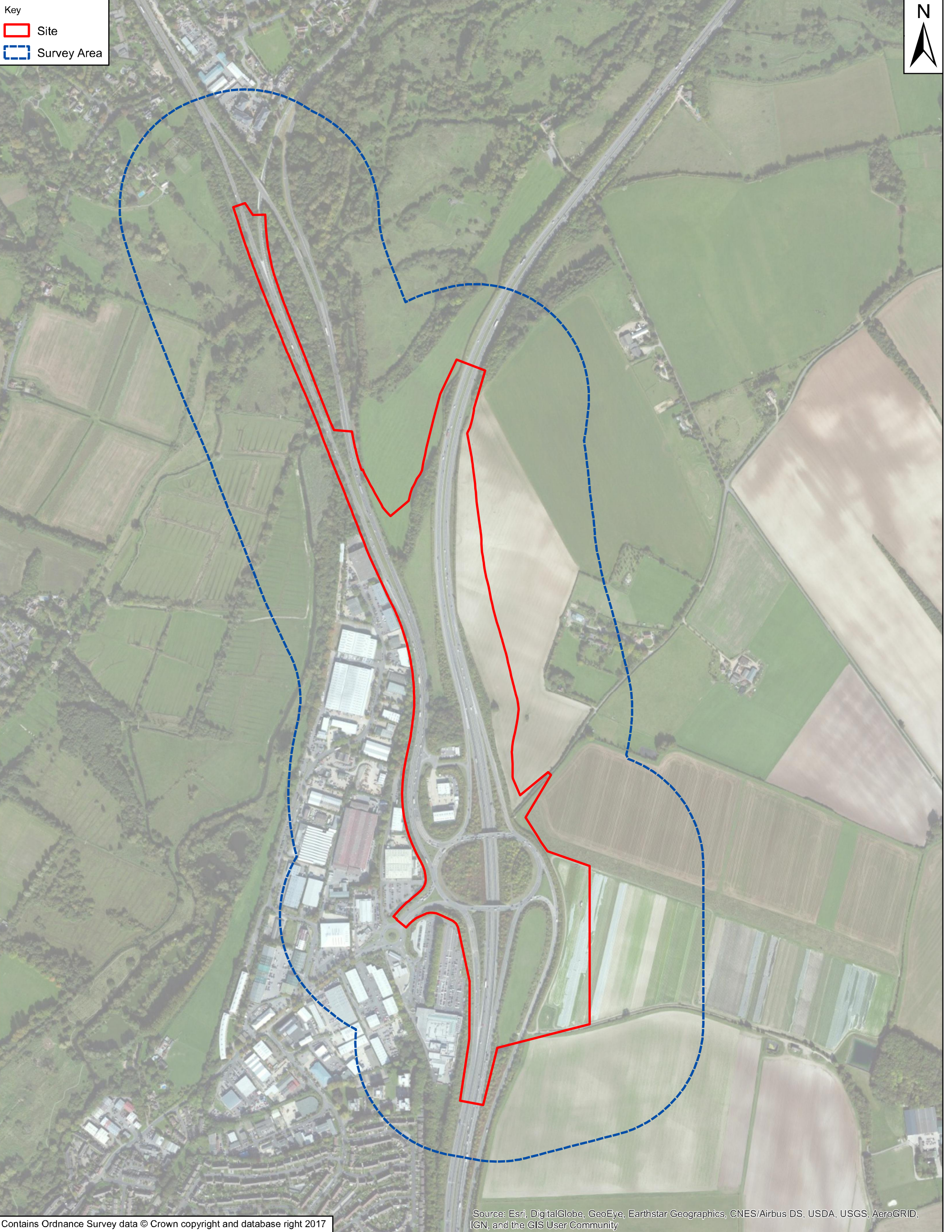
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8

FIGURES

FIGURE 8.1 SITE LOCATION PLAN

Key
 Site
 Survey Area



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

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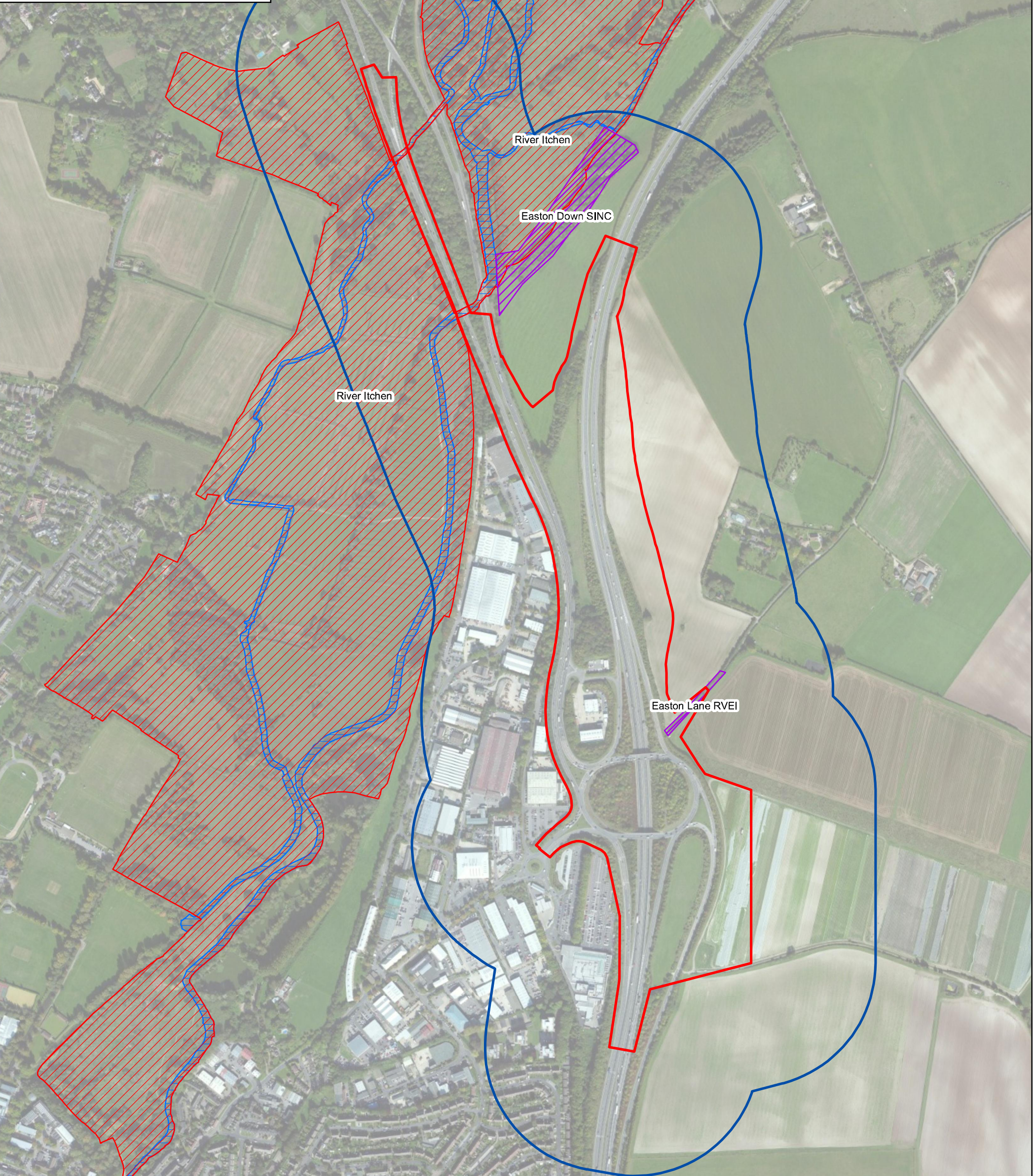
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FIGURE 8.2 DESIGNATED SITES

Key

	Site
	Survey Area
	Non-Statutory Designated Sites
	Site of Special Scientific Interest (Eng)
	Special Area of Conservation (Eng)



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

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REV	DATE	BY	DESCRIPTION	CHK	APP

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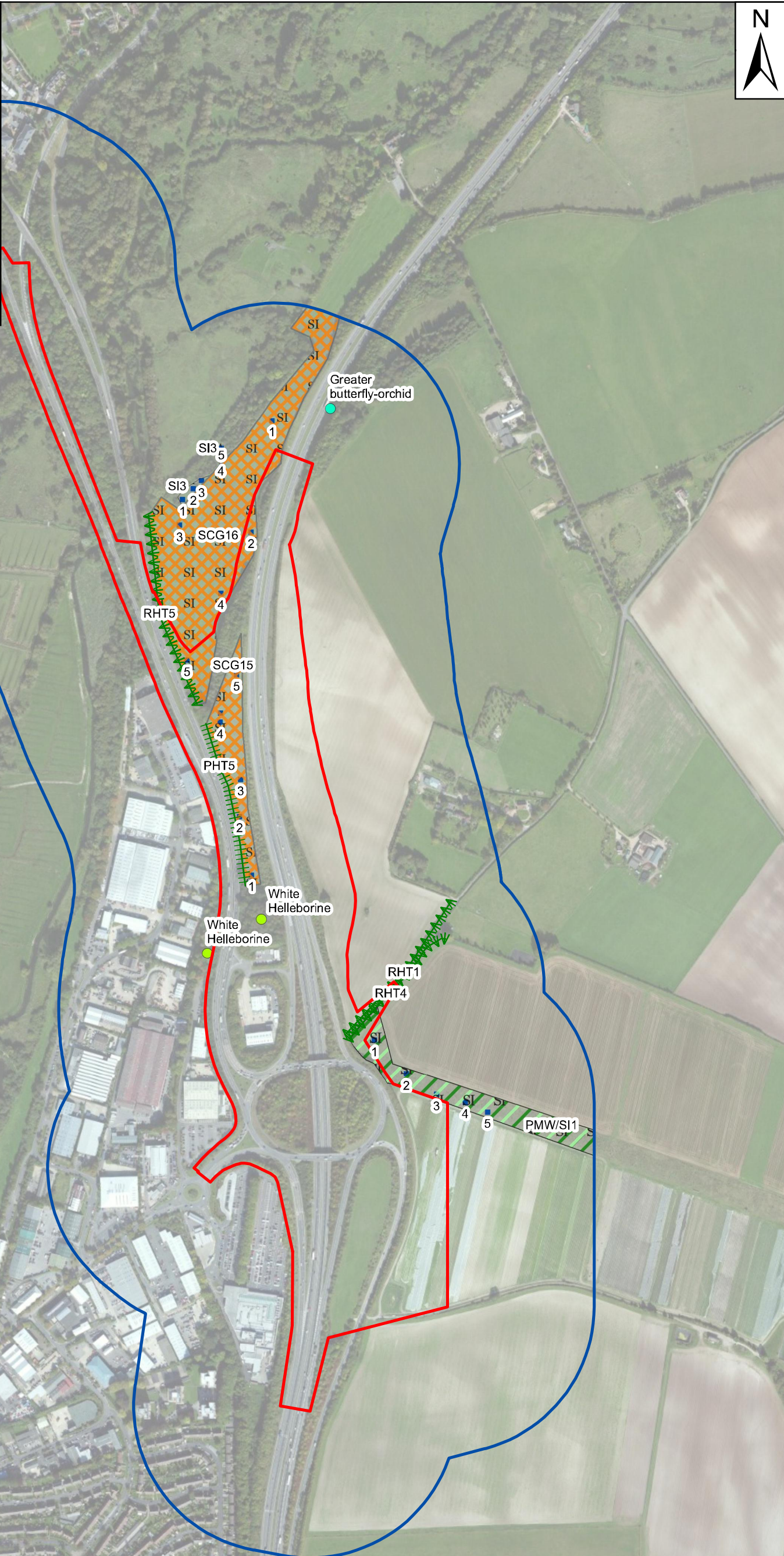
PROJECT:
M3 Junction 9

TITLE:
Figure 8.2 - Designated Sites

SCALE @ A3: 7,500	CHECKED: LR	APPROVED: APP
FILE: 2	DRAWN: BW	DATE: September 2017
PROJECT No: 70016638	DRAWING No: 2	REV: A
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FIGURE 8.3 BOTANICAL SURVEY

	Site
	Survey Area
	Hedge with Trees - Species-Poor (PHT5)
	Hedge with Trees - Species-Rich (RHT1/4/5)
	Calcareous Grassland - Semi-Improved (SCG15/16)
	Mixed Woodland - Plantation (PMW/SI1)
	Poor Semi-Improved Grassland (SI3)
	White Helleborine
	Greater Butterfly Orchid
	Quadrats



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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
DRAWING STATUS: FINAL					




PROJECT:	M3 Junction 9
TITLE:	Figure 8.3 - Botanical Survey

SCALE @ A3:	7,500	CHECKED:	LR	APPROVED:	APP
FILE:	3	DRAWN:	BW	DATE:	September 2017
PROJECT No:	70016638	DRAWING No:	3	REV:	A
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Appendix A

M3 VERGE GRASSLAND SPECIES LISTS

TABLE A1 NORTHBOUND/ WESTERN VERGE GRASSLAND SPECIES LIST

SPECIES NAME	COMMON NAME	DAFOR
<i>Arrhenatherum elatius</i>	False oat grass	D
<i>Hedera helix</i>	Ivy	LD
<i>Brachypodium sylvaticum</i>	False brome	A
<i>Clematis vitalba</i>	Traveller's joy	A
<i>Dactylis glomerata</i>	Cock's foot	A
<i>Eupatorium cannabinum</i>	Hemp agrimony	A
<i>Festuca rubra</i>	Red fescue	A
<i>Leucanthemum vulgare</i>	Ox eye daisy	A
<i>Anacamptis pyramidalis</i>	Pyramidal orchid	LA
<i>Epipactis helleborine</i>	Broad-leaved helleborine	LA
<i>Artemisia vulgaris</i>	Mugwort	F
<i>Bromus hordeaceus</i>	Soft brome	F
<i>Cochlearia danica</i>	Danish scurvy-grass	F
<i>Daucus carota</i>	Wild carrot	F
<i>Dipsacus fullonum</i>	Teasel	F
<i>Galium album</i>	Hedge bedstraw	F
<i>Linaria vulgaris</i>	Common toad flax	F
<i>Medicago lupulina</i>	Black medick	F
<i>Solidago canadensis</i>	Canadian goldenrod	F
<i>Achillea millefolium</i>	Yarrow	O
<i>Bellis perennis</i>	Common daisy	O
<i>Bromus sterilis</i>	Barren brome	O
<i>Hypericum perforatum</i>	Perforate St John's-wort	O
<i>Origanum vulgare</i>	Wild Marjoram	O
<i>Plantago lanceolata</i>	Ribwort plantain	O
<i>Poa trivialis</i>	Rough meadow grass	O
<i>Reseda lutea</i>	Wild mignonette	O
<i>Silene vulgaris</i>	Bladder campion	O
<i>Vicia cracca</i>	Tufted vetch	O
<i>Vicia sativa</i>	Common vetch	O
<i>Allium oleraceum</i>	Field garlic	R
<i>Anagallis arvensis</i>	Scarlet pimpernel	R
<i>Centaurea scabiosa</i>	Greater knapweed	R
<i>Filipendula ulmaria</i>	Meadow sweet	R
<i>Fumaria sp.</i>	Fumitory sp.	R
<i>Galium verum</i>	Ladies bedstraw	R
<i>Trifolium campestre</i>	Hop trefoil	R
<i>Trifolium repens</i>	White clover	R
<i>Tussilago farfara</i>	Colt's foot	R
<i>Verbascum blattaria</i>	Moth mullein	R

SPECIES NAME	COMMON NAME	DAFOR
<i>Verbascum thapsus</i>	Great mullein	R
<i>Veronica hederifolia</i>	Ivy speedwell	R
<i>Veronica persica</i>	Field speedwell	R

TABLE A2 NORTHBOUND/ WESTERN VERGE GRASSLAND SPECIES LIST

SPECIES NAME	COMMON NAME	DAFOR
<i>Arrhenatherum elatius</i>	False oat grass	D
<i>Brachypodium sylvaticum</i>	False brome	A
<i>Clematis vitalba</i>	Traveller's joy	A
<i>Festuca rubra</i>	Red fescue	A
<i>Leucanthemum vulgare</i>	Ox eye daisy	A
<i>Anacamptis pyramidalis</i>	Pyramidal orchid	LA
<i>Artemisia vulgaris</i>	Mugwort	F
<i>Cochlearia danica</i>	Danish scurvy-grass	F
<i>Dactylis glomerata</i>	Cock's foot	F
<i>Daucus carota</i>	Wild carrot	F
<i>Eupatorium cannabinum</i>	Hemp agrimony	F
<i>Linaria vulgaris</i>	Common toad flax	F
<i>Plantago lanceolata</i>	Ribwort plantain	F
<i>Pulicaria dysenterica</i>	Common fleabane	F
<i>Solidago canadensis</i>	Canadian goldenrod	F
<i>Bromus hordeaceus</i>	Soft brome	O
<i>Bromus sterilis</i>	Barren brome	O
<i>Cirsium arvense</i>	Creeping thistle	O
<i>Glechoma hederacea</i>	Ground ivy	O
<i>Hypericum perforatum</i>	Perforate St John's-wort	O
<i>Jacobaea vulgaris</i>	Common ragwort	O
<i>Myosotis sp.</i>	Forget-me-not	O
<i>Origanum vulgare</i>	Wild Marjoram	O
<i>Poa trivialis</i>	Rough meadow grass	O
<i>Silene vulgaris</i>	Bladder campion	O
<i>Stachys sylvatica</i>	Hedge woundwort	O
<i>Trifolium dubium</i>	Lesser trefoil	O
<i>Verbascum blattaria</i>	Moth mullein	O
<i>Veronica serpyllifolia</i>	Thyme-leaved speedwell	O
<i>Vicia cracca</i>	Tufted vetch	O
<i>Vicia sativa</i>	Common vetch	O
<i>Agrimonia eupatoria</i>	Agrimony	R
<i>Blackstonia perfoliata</i>	Yellow-wort	R
<i>Centaurea scabiosa</i>	Greater knapweed	R
<i>Centaureum erythraea</i>	Common Centaury	R

SPECIES NAME	COMMON NAME	DAFOR
<i>Conium maculatum</i>	Hemlock	R
<i>Schedonorus arundinaceus</i>	Tall fescue	R
<i>Geranium pyrenaicum</i>	Hedgerow cranesbill	R
<i>Heracleum sphondylium</i>	Hogweed	R
<i>Knautia arvensis</i>	Field scabious	R
<i>Mentha sp.</i>	Mint sp.	R
<i>Orobanche sp.</i>	Broomrape sp.	R
<i>Platanthera chlorantha</i>	Greater butterfly orchid	R
<i>Poa pratensis</i>	Smooth meadow grass	R
<i>Reseda lutea</i>	Wild mignonette	R
<i>Tragopogon pratensis</i>	Goat's beard	R
<i>Veronica chamaedrys</i>	Germander speedwell	R
<i>Vicia hirsuta</i>	Hairy tare	R

Appendix B

NVC FLORISTIC TABLES

SCIENTIFIC NAME	COMMON NAME	FREQUENCY	QUADRAT/ DOMIN SCORE				
			1	2	3	4	5
<i>Arrhenatherum elatius</i>	False oat grass	V	10	10	10	10	10
<i>Urtica dioica</i>	Common nettle	IV	4	1	2	4	
<i>Dactylis glomerata</i>	Cock's foot	III			4	4	4
<i>Eupatorium cannabinum</i>	Hemp agrimony	III	1		1		2
<i>Cirsium arvense</i>	Creeping thistle	II		1			3
<i>Festuca rubra</i>	Red fescue	II		2	4		
<i>Glechoma hederacea</i>	Ground ivy	II				2	3
<i>Heracleum sphondylium</i>	Hogweed	II				1	3
<i>Lamium album</i>	White nettle	II	1	1			
<i>Centaurea nigra</i>	Common knapweed	I					1
<i>Odontites vernus</i>	Red bartsia	I			1		
<i>Potentilla reptans</i>	Creeping cinquefoil	I					3
<i>Pulicaria dysenterica</i>	Common fleabane	I	1				
<i>Sanguisorba minor</i>	Salad burnet	I		2			
<i>Silene vulgaris</i>	Bladder campion	I					1
<i>Solanum dulcamara</i>	Bittersweet	I	1				
<i>Torilis japonica</i>	Upright hedge parsley	I					2

TABLE B1- FLORISTIC TABLE FOR SI3

HABITAT PHOTOGRAPHS



TABLE B2- FLORISTIC TABLE FOR SCG15

SCIENTIFIC NAME	COMMON NAME	FREQUENCY	QUADRAT/ DOMIN SCORE				
			1	2	3	4	5
<i>Dactylis glomerata</i>	Cock's foot	V	5	6	4	3	3
<i>Festuca rubra</i>	Red fescue	V	5	5	7	9	9
<i>Trifolium repens</i>	White clover	V	4	3	3	4	4
<i>Linum catharticum</i>	Fairy flax	IV	2	1	3	2	
<i>Torilis japonica</i>	Upright hedge parsley	IV	2	3	3		2
<i>Agrostis stolonifera</i>	Creeping bent	III		3	3		4
<i>Clematis vitalba</i>	Traveller's joy	III		1	1		2
<i>Crepis tectorum</i>	Narrow leaved hawks beard	III			3	3	3
<i>Daucus carota</i>	Wild carrot	III	3	2		2	
<i>Eupatorium cannabinum</i>	Hemp agrimony	III	1	1	4		
<i>Holcus lanatus</i>	Yorkshire fog	III	2		4		4
<i>Senecio erucifolius</i>	Hoary ragwort	III	2		3	1	
<i>Senecio vulgaris</i>	Common ragwort	III	2	1			1
<i>Lolium perenne</i>	Perennial rye-grass	III	5	4			3
<i>Medicago lupulina</i>	Black medick	III	1	3			3

SCIENTIFIC NAME	COMMON NAME	FREQUENCY	QUADRAT/ DOMIN SCORE				
			1	2	3	4	5
<i>Achillea millefolium</i>	Yarrow	II	3			2	
<i>Agrostis capillaris</i>	Common bent	II			3	3	
<i>Anagallis arvensis</i>	Scarlet pimpernel	II			2	2	
<i>Bromus hordeaceus</i>	Soft brome	II	4				1
<i>Vicia tetrasperma</i>	Smooth tare	II	2	2			
<i>Arrhenatherum elatius</i>	False oat grass	I			1		
<i>Cerastium fontanum</i>	Common mouse-ear	I	3				
<i>Cirsium arvense</i>	Creeping thistle	I			3		
<i>Dipsacus fullonum</i>	Teasel	I		1			
<i>Epilobium montanum</i>	Broad-leaved willowherb	I	1				
<i>Erigeron acris</i>	Blue fleabane	I	3				
<i>Geranium molle</i>	Dove's-foot cranesbill	I	1				
<i>Helminthotheca echioides</i>	Bristly ox tongue	I	1				
<i>Hypericum pulchrum</i>	Slender St John's-wort	I			1		
<i>Inula conyzae</i>	Ploughman's-spikenard	I		1			
<i>Leucanthemum vulgare</i>	Ox-eye daisy	I					5
<i>Origanum vulgare</i>	Marjoram	I				2	
<i>Ranunculus repens</i>	Creeping buttercup	I					4
<i>Sherardia arvensis</i>	Field madder	I	1				
<i>Veronica persica</i>	Field speedwell	I	1				



TABLE B3- FLORISTIC TABLE FOR SCG16

SCIENTIFIC NAME	COMMON NAME	FREQUENCY	QUADRAT/ DOMIN SCORE				
			1	2	3	4	5
<i>Agrostis stolonifera</i>	Creeping bent	5	5	3	3	5	3
<i>Bromus hordeaceus</i>	Soft brome	5	5	3	3	8	5
<i>Dactylis glomerata</i>	Cock's foot	5	5	4	4	4	5
<i>Festuca rubra agg.</i>	Red fescue	5	5	9	3	4	4
<i>Trifolium repens</i>	White clover	5	3	3	1	3	4
<i>Geranium molle</i>	Dove's-foot cranesbill	4	2	1	3	2	

SCIENTIFIC NAME	COMMON NAME	FREQUENCY	QUADRAT/ DOMIN SCORE				
			1	2	3	4	5
<i>Medicago lupulina</i>	Black medick	3	1	3		1	
<i>Lolium perenne</i>	Perennial rye-grass	III	1			1	5
<i>Cirsium arvense</i>	Creeping thistle	III	1		2	1	
<i>Cerastium fontanum</i>	Common mouse-ear	III			1	1	1
<i>Clematis vitalba</i>	Traveller's joy	II	1			1	
<i>Senecio erucifolius</i>	Hoary ragwort	II		1	1		
<i>Odontites vernus</i>	Red bartsia	II	1		1		
<i>Taraxacum agg.</i>	Dandelion	II			3	1	
<i>Agrostis capillaris</i>	Common bent	I	3				
<i>Arrhenatherum elatius</i>	False oat grass	I			1		
<i>Bromus erectus</i>	Upright brome	I	2				
<i>Helictotrichon pubescens</i>	Downy oatgrass	I		2			
<i>Holcus lanatus</i>	Yorkshire fog	I			2		
<i>Hypericum pulchrum</i>	Slender St John's-wort	I		1			
<i>Tragopogon pratensis</i>	Goat's beard	I				3	
<i>Veronica persica</i>	Field speedwell	I	1				



TABLE B4- FLORISTIC TABLE FOR PMW/SI1

SCIENTIFIC NAME	COMMON NAME	FREQUENCY	QUADRAT/ DOMIN SCORE				
			1	2	3	4	5
<i>Dactylis glomerata</i>	Cock's foot	V	8	7	5	5	8
<i>Taraxicum agg.</i>	Dandelion	V	2	2	3	2	3
<i>Jacobaea erucifolia</i>	Hoary ragwort	IV	4	1	1	3	
<i>Arrhenatherum elatius</i>	False oat grass	III		8	2	9	
<i>Cirsium arvense</i>	Creeping thistle	III	1			2	2
<i>Festuca rubra</i>	Red fescue	III	2		9		5
<i>Elymus repens</i>	Common couch	II		4			4
<i>Epilobium parviflorum</i>	Hoary willowherb	II			3	2	
<i>Inula conyza</i>	Ploughman's-spikenard	II			1	1	
<i>Plantago lanceolata</i>	Ribwort plantain	II	1	1			
<i>Rubus fruticosus</i>	Bramble	II		1	1		
<i>Crategus monogyna</i>	Hawthorn	I					1
<i>Daucus carota</i>	Wild carrot	I	1				
<i>Epilobium montanum</i>	Broad-leaved willowherb	I		3			
<i>Geranium molle</i>	Dove's-foot cranesbill	I	2				
<i>Holcus lanatus</i>	Yorkshire fog	I		2			
<i>Hypericum perforatum</i>	Perforate St John's-wort	I			3		
<i>Plantago major</i>	Greater plantain	I	2				

SCIENTIFIC NAME	COMMON NAME	FREQUENCY	QUADRAT/ DOMIN SCORE				
			1	2	3	4	5
<i>Sonchus asper</i>	Prickly sow thistle	1	2				
<i>Trifolium dubium</i>	Lesser trefoil	1	1				
<i>Trifolium repens</i>	White clover	1	1				
<i>Tussilago farfara</i>	Colt's foot	1	1				

