A303 Sparkford to Ilchester Dualling Scheme TR010036

6.3 Environmental Statement

Appendix 8.2 National Vegetation Classification Technical Report

APFP Regulation 5(2)(a)
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The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

A303 Sparkford to Ilchester Dualling Scheme

Development Consent Order 201[X]

6.3 Environmental Statement
Appendix 8.2 National Vegetation Classification Technical Report

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Executive summary

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

National Vegetation Classification (NVC) surveys were undertaken in areas of sensitive habitat likely to be affected by the scheme. This report presents the results of the NVC surveys undertaken in April and July 2017 in grassland and woodland habitats. It also presents the further recommendations for mitigation, compensation and enhancement based on the preliminary assessment of ecological impacts.

The botanical surveys were undertaken in areas likely to be adversely impacted by the scheme, including the scheme footprint and a 200 metre buffer around it. A total of 15 sites were selected for surveys, 11 woodland and 4 grassland. Eight sites were identified as being within the following non-statutory designated sites for nature conservation: Downhead Manor Farm Local Wildlife Site (LWS), Camel Hill Transmitter Site LWS, Parson's Steeple LWS, Lindsay House Quarry LWS, Ridge Copse LWS and Hazlegrove Park LWS.

The following Section 41 habitats of principal importance were recorded: 2 areas of lowland meadow and 9 areas of deciduous mixed woodland. Three rare or notable plant species were recorded including the Near Threatened quaking-grass *Briza media*, field scabious *Knautia arvensis* and devil's-bit scabious *Succisa pratensis*.

The semi-natural woodlands surveyed consisted of the following NVC sub-communities, which are all considered to be habitats of principal importance:

- W8a *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Primula vulgaris-Glechoma hederacea* sub-community
- W8d *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Hedera helix sub-community*
- W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Geranium robertianum* sub-community
- W12a *Fagus sylvatica-Mercurialis perennis* woodland, *Mercurialis perennis* sub-community

The semi-improved and unimproved neutral grasslands including scrub and tall ruderal communities surveyed consisted of the following NVC sub-communities, of which, only the MG5 communities are considered habitats of principal importance:

- MG1a *Arrhenatherum elatius* grassland, *Festuca rubra* sub-community
- MG5a *Cynosurus cristatus-Centaurea nigra* grassland, *Lathyrus pratensis* sub-community
- MG5b *Cynosurus cristatus-Centaurea nigra* grassland, *Galium verum* sub-community
- OV24a *Urtica dioica-Galium aparine* sub-community

- MG7c *Lolium perenne* leys and related grasslands, *Lolium perenne-Alopecurus pratensis-Festuca pratensis* grassland
- W24a *Rubus fruticosus-Holcus lanatus* underscrub, *Arrhenatherum elatius-Heracleum sphondylium* sub-community

Woodland sites 6, 8, 9 and 13 and grassland sites 3 and 4, would be directly impacted by the scheme with habitat removal during construction. Woodland sites 8, 9 and 13 are the only habitats of principle importance that would be directly impacted. No principally important grassland habitats (MG5) would be directly impacted. Indirect impacts for the remaining woodland and grassland sites are likely.

Recommendations for mitigation include:

- Habitats of principal importance would be avoided where possible, or impacts would be reduced. Where this is not possible, habitat would be compensated through habitat creation as part of the Environmental Masterplan (Figure 2.8 of the Environmental Statement, Volume 6.2). Recreated woodland habitat would be maintained and monitored for 5 years (grassland habitat of principal importance would not be directly impacted).
- Temporary habitat disturbance would be mitigated through appropriate routing of access and assembly areas in areas of low conservation importance.
- Follow best practice to protect all trees to be retained.
- Use of matting and staff awareness to reduce damage to habitats of principal importance where construction works would be located within them.
- Reduction of edge effects during operation through appropriate management of habitats adjacent to scheme.

1 Introduction

1.1 Overview of the scheme

Existing corridor

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

Existing road

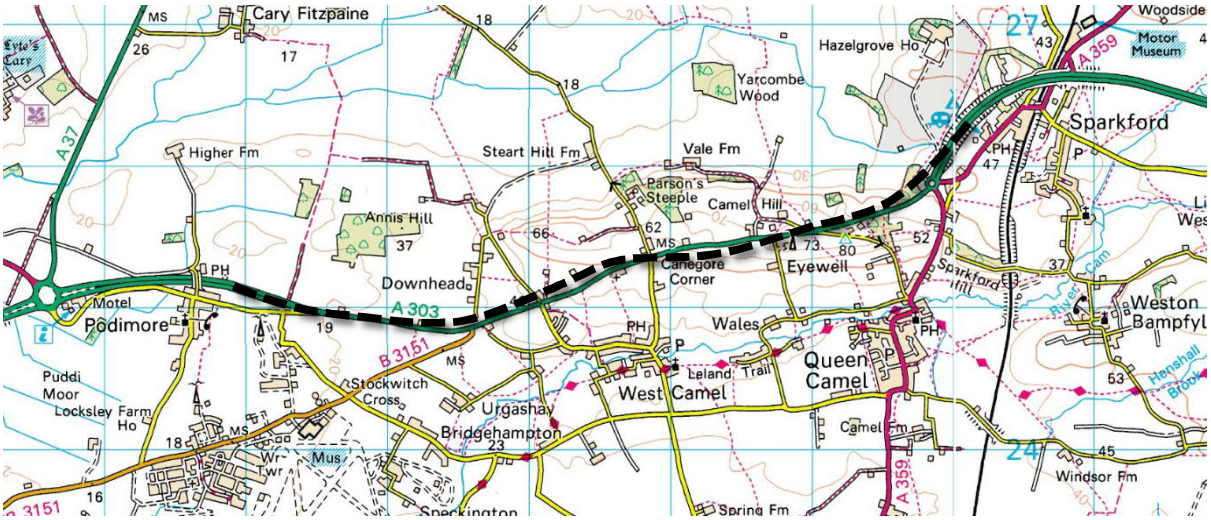
1.1.2 The section of the A303 that is being upgraded as part of this scheme commences at the eastern limits of the existing dual carriageway, the Podimore Bypass. Travelling east, the corridor reaches the junction with the B3151 before bearing north east and rising upwards through Canegore Corner to reach the crest of Camel Hill at Eyewell. This section of the corridor is characterised by a single lane road, with double white lines negating overtaking and subject to a 50 miles per hour speed limit. There are several priority junctions along the route giving access to the settlements of Queen Camel and West Camel to the south and Downhead to the north, as well as several farm accesses and parking laybys.

1.1.3 From the crest of Camel Hill, the corridor descends to meet the roundabout at the western limit of the dual carriageway Sparkford Bypass (Hazlegrove Roundabout). This section comprises 2 lanes in the westbound direction, 1 lane in the eastbound direction and is also subject to a 50 miles per hour speed limit. Hazlegrove Roundabout forms a junction between the A303 and the A359 which runs south through Queen Camel and north-east through Sparkford. The roundabout also provides access to a service station, and to a school at Hazlegrove House.

1.1.4 The section of the A303 that is to be upgraded is almost 3.5 miles, or approximately 5.6 kilometres long.

1.1.1 The extents of the scheme are illustrated in Figure 1.1 below. Figure 2.1 of Volume 6.2 shows the proposed red line boundary for the scheme.

Figure 1.1: Scheme extents



Source: Mott MacDonald Sweco Joint Venture

Scheme proposals

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

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

1.2 Scope of the report

1.2.1 The objectives of this report are:

- to present the results of the National Vegetation Classification (NVC) surveys
- to identify sensitive habitats and plant communities present within the Zone of Influence (Zol)
- to identify protected, rare and notable plant species
- to assess the composition, structure and conservation importance of these habitats, plant communities and species
- to assess the potential impacts of the scheme on these habitats, plant communities and species
- to provide recommendations for further survey work, mitigation, compensation and enhancement
- provide an ecological impact assessment following the methodology in the *Design Manual for Roads and Bridges* (DMRB) and CIEEM (2016)

1.3 Zone of influence

1.3.1 The Zol for a project is the area over which ecological features may be subject to significant effects as a result of the proposed scheme and associated activities[1]. The Zol for this scheme for notable habitats has been set at 200 metres from the permanent and temporary land acquisition areas of the red line boundary of the scheme. This buffer was selected based on professional judgement of the likely direct and indirect impacts of the scheme on habitats.

1.3.2 The aim of the botanical surveys is to assess the composition, structure and conservation importance of the plant communities present in the semi-improved neutral grassland and semi-natural woodland within the Zol.

[1] Chartered Institute of Ecology and Environmental Management (CIEEM) (2016). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd Edition*. CIEEM; Winchester.

2 Methodology

2.1 Desk study

2.1.1 A detailed biological records search was requested from Somerset Environmental Records Centre (SERC) in May 2017, within a 2 kilometre radius of the scheme. All records for protected species, priority habitats and designated sites were returned. Plant records within 200 metres of the scheme are summarised in Table 2.1 below and records for the full 2 kilometre search are mapped in appendix A, and fully listed in appendix B.

Table 2.1: SERC plant record data return 2017

Record	Scientific Name	Common name	Site location	Grid reference	Date	Distance from scheme metres	Direction
3	*Daphne laureola*	Spurge-laurel	Ridge Copse	ST597257	26/04/1989	10	S
4	*Cirsium eriophorum*	Woolly Thistle	Ridge Copse	ST597257	26/04/1989	10	S
5	*Anacamptis pyramidalis*	Pyramidal Orchid	Gason Lane Field	ST592255	01/01/1990	50	SE
13	*Anacamptis pyramidalis*	Pyramidal Orchid	Camel Hill Transmitter Site	ST588255	08/07/1991	In Footprint	N/A
16	*Anacamptis pyramidalis*	Pyramidal Orchid	Camel Hill Transmitter Site	ST588255	24/06/1992	In Footprint	N/A
17	*Cirsium dissectum*	Meadow Thistle	Gason Lane Field	ST592255	25/11/1991	50	SE
18	*Cirsium eriophorum*	Woolly Thistle	Gason Lane Field	ST592255	25/11/1991	40	S
24	*Blackstonia perfoliata*	Yellow-wort	Lindsay House Quarry	ST568255	15/07/1992	210	NW
26	*Daphne laureola*	Spurge-laurel	Parson's Steeple &	ST579258	09/05/1991	140	N
28	*Tilia cordata*	Small-leaved Lime	Ridge Copse	ST595255	13/05/1991	128	S
40	*Daphne laureola*	Spurge-laurel	Parson's Steeple &	ST579258	08/02/1993	140	N
41	*Anacamptis pyramidalis*	Pyramidal Orchid	Lindsay House Quarry	ST568255	25/06/1993	210	NW
52	*Ononis spinosa*	Spiny Restharrow	Camel Hill Farm	ST587257	13/09/1988	20	N

2.2 NVC surveys

2.2.1 NVC surveys were undertaken in April and July 2017 for habitats that fall within 200 metres of the scheme. These habitats were identified during the Phase 1 habitat surveys undertaken in 2016 and 2017 (see Figure 8.1 of the Environmental Statement, Volume 6.2) as being particularly diverse or

sensitive, of a type restricted in the UK or region, and which could be directly or indirectly affected by the scheme. The areas subject to surveys are shown in appendix C.

2.2.2 These habitat areas were surveyed using methods based on Rodwell (2006)[2] and Rodwell et al (1991[3]; 1992[4]; 2000[5]).

2.2.3 At each site selected for an NVC survey, habitats were sampled using vegetation quadrats following NVC methodology. Stands of homogenous vegetation were identified and an appropriate number of quadrats of a size appropriate to the vegetation type were randomly surveyed within each stand. For grassland, this involved sampling up to 5 stands of homogenous or representative habitat using quadrats 2 metres by 2 metres in size. For woodland, this involved sampling up to 5 quadrats of appropriate size for the layers present; woodland field layers 4 metres by 4 metres, dense scrub layer 10 metres by 10 metres and canopy and understorey layer 50 metres by 50 metres. Where the area was relatively small or where access was restricted, fewer quadrats were used.

2.2.4 Within each quadrat, all species were recorded with an estimate of cover or abundance using the Domin scale (Table 2.2). The data was subsequently combined to produce a floristic table for each type of vegetation.

2.2.5 The location of each quadrat was then recorded, a GPS coordinate taken and the extent of each plant community recorded within the area survey area.

2.2.6 Full plant species lists were compiled for each plant community and the relative abundances and frequencies of the plant species were recoded using the Domin and DAFOR scales (Tables 2.2 and 2.3).

2.2.7 Each vegetation community was described in terms of key species, vegetation structure, management and relationship with neighbouring vegetation.

Table 2.2: Assessment of species percentage cover using Domin Scale

Domin Scale	Percentage Cover
10	91-100
9	76-90
8	51-75

[2] Rodwell, J.S. (2006). *National Vegetation Classification: User's Handbook*. Joint Nature Conservation Committee, Peterborough.
[3] Rodwell, J.S, Pigott, C., Ratcliffe, D., Malloch, A., Birks, H., Proctor, M., Shimwell, D., Huntley, J., Radford, E., Wigginton, M. and Wilkins, P. (1991) *British Plant Communities. Volume 1: Woodlands and scrub*. Joint Nature Conservation Committee, Peterborough.
[4] Rodwell, J.S, Pigott, C., Ratcliffe, D., Malloch, A., Birks, H., Proctor, M., Shimwell, D., Huntley, J., Radford, E., Wigginton, M. and Wilkins, P. (1992) *British Plant Communities. Volume 3: Grasslands and montane communities.* Joint Nature Conservation Committee, Peterborough.
[5] Rodwell, J.S., Dring, J.C., Averis, A.B.G., Proctor, M.C.F., Malloch, A.J.C., Schaminee, J.H.J. & Dargie, T.C.D. (2000). *Review of Coverage of the National Vegetation Classification*. Joint Nature Conservation Committee, Peterborough.

Domin Scale	Percentage Cover
7	34-50
6	26-33
5	11-25
4	4-10
3	<4%, many individuals
2	<4%, several individuals
1	<4%, few individuals

Table 2.3: Assessment of species abundance and frequency using the DAFOR scale

DAFOR Scale	Meaning
D	Dominant
A	Abundant
F	Frequent
O	Occasional
R	Rare

2.2.8 The nomenclature for the vascular plants in this report follows Stace[6] for both scientific and English names. The bryophyte nomenclature follows Atherton[7] for scientific names.

2.3 Data analysis

2.3.1 The data from each plant community were tabulated and a constancy value for each species calculated for each defined group of quadrats as shown in Table 2.4 below. Where fewer than 5 quadrats were used, the constancy value was interpreted appropriately.

Table 2.4: Constancy values used in NVC surveys

Constancy Value	Percentage Cover
I	1-20%
II	21-40%
III	41-60%
IV	61-80%
V	81%

2.3.2 The constancy tables were used to assign each plant community to a community or sub-community type according to Rodwell et al (1991[8]; 1992[9]).

[6] Stace, C.S. (2010). *New Flora of the British Isles. 3rd Edition*. Cambridge University Press, Cambridge.
[7] Atherton, I., Bosanquet, S. and Llawley, M. (Eds.) (2010). *Mosses and Liverworts of Britain and Ireland: A Field Guide*. British Bryological Society.
[8] Rodwell, J.S, Pigott, C., Ratcliffe, D., Malloch, A., Birks, H., Proctor, M., Shimwell, D., Huntley, J., Radford, E., Wigginton, M. and Wilkins, P. (1991) *British Plant Communities. Volume 1: Woodlands and scrub*. Joint Nature Conservation Committee, Peterborough.
[9] Rodwell, J.S, Pigott, C., Ratcliffe, D., Malloch, A., Birks, H., Proctor, M., Shimwell, D., Huntley, J., Radford, E., Wigginton, M. and Wilkins, P. (1992*) British Plant Communities. Volume 3: Grasslands and montane communities.* Joint Nature Conservation Committee, Peterborough.

2.4 Limitations of survey methods

2.4.1 Ecological surveys are limited by factors such as time of year, which affect the ability to detect plants. Optimal survey times vary between species and species groups therefore, a single survey visit may overlook or under-record certain species. The site surveys were undertaken in April and July 2017, which is considered to be within the optimal time of year for species of these habitat types. The survey, together with the desk study, is considered sufficient to identify constraints for these habitats.

3 Results

3.1.1 This section provides a summary of the survey results. The locations of the survey areas are shown within appendix C. The survey data is appended in appendix D for woodlands and appendix E for grasslands, and survey photographs in appendix F.

3.2 Woodland sites

Woodland site 3

3.2.1 This small block of semi-natural broad-leaved woodland most resembles *W8d Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Hedera helix* sub-community. Ash and field maple are present within the canopy, whilst ivy is constant and locally dominant throughout. This woodland is approximately 1,570m² in size and is located on steep and uneven ground. The northern perimeter of the woodland is adjacent to a public bridleway (Slate Lane), whilst agriculturally managed pasture grassland is situated to the south and west. The woodland canopy layer, with an average height of 8 metre, is patchy and comprises frequent semi-mature ash with rarely occurring English elm, hawthorn and field maple.

3.2.2 The species composition of the sub-canopy layer (average height of 4 metre) is more dense and diverse, comprised of frequent and locally abundant elder, occasional hazel, English elm, plus rare hawthorn, dogwood, blackthorn and dog-rose *Rosa canina*. The ground flora is species-poor and dominated by ivy throughout. Other species present include occasional lords-and-ladies, bramble and lesser celandine, plus rare common hogweed *Heracleum sphondylium*, and cleavers. Ivy and lords-and-ladies are both constant species within the woodland site, whilst rough-stalked feather moss is the only bryophyte in the ground layer. Small patches of bare ground and leaf litter are present throughout and dead wood occurs occasionally.

Woodland site 5

3.2.3 Site 5 includes 2 linear features approximately 600 metres in length along a bridleway (Slate Lane) between Downhead lane and Steart Hill, encompassing scrub, scattered trees and hedgerow. As this site does not include woodland habitat, no NVC data (quadrats) was collected. A hawthorn-elm-privet hedge is present on the south side of the bridleway, whilst a dry ditch is also present towards the eastern extent. Trees include frequent ash and field maple, whilst scrub includes frequent field maple saplings and elder, frequent to locally frequent wild privet plus occasional ash saplings, hazel, dog rose *Rosa canina*, blackthorn, and dogwood.

3.2.4 Ivy is abundant and locally dominant in the ground flora. Also present is occasional to locally abundant cow parsley *Anthriscus sylvestris*, occasional to locally frequent elm seedlings, occasional lords-and-ladies, cleavers, lesser celandine, blackthorn and dogwood seedlings plus rare elder seedlings, garlic mustard, traveller's joy *Clematis vitalba*, wood avens, bramble, herb-Robert *Geranium robertianum*, curled dock, pendulous sedge, hogweed, hart's-tongue *Phyllitis scolopendrium*, red campion *Silene dioica*, ground-ivy *Glechoma hederacea*, ivy-leaved speedwell *Veronica hederifolia* and black bryony. Grass species were present though sparse with occasional rough meadow grass and false brome. Other ground flora present that are often found on the edge of woodlands include occasional broad-leaved dock plus rare spear thistle *Cirsium vulgare*, perforate St. John's wort *Hypericum perforatum*, tutsan *Hypericum androsaemum*, hemlock *Conium maculatum*, lesser burdock *Arctium minus* and white dead-nettle *Lamium album*. Rough-stalked feather moss is present occasionally as the only bryophyte within the ground layer.

Woodland site 6

3.2.5 Site 6 is a green lane between arable fields, which has previously been felled and may once have been a woodland (tree stumps are visible). Only a few trees remain on the boundaries of this site and both linear features have been managed as hedgerows. An NVC survey was not considered appropriate as no woodland habitat was present.

3.2.6 The western extent of the site comprises a line of semi-mature trees including frequent wild privet, frequent to locally frequent blackthorn, occasional ash, field maple, hawthorn and elder, as well as rare guelder-rose *Viburnum opulus* and grey willow *Salix cinerea*. The ash trees within this area have been coppiced. The eastern boundary comprises of a more heavily managed hedgerow with an average height of 1 metre. Species present include frequent to locally abundant blackthorn, occasional ash, elder, wild privet, field maple and hawthorn with rare dog-rose *Rosa canina*, traveller's joy and redcurrant *Ribes rubrum*.

3.2.7 The ground flora in the green lane is relatively species-rich and comprises occasional to locally abundant common nettle and false oat-grass, occasional to locally frequent red campion, lords-and-ladies, figwort *Scrophularia nodosa*, curled dock, ground ivy, enchanter's nightshade, garlic mustard and pendulous sedge. Occasional species present include dandelion, cleavers, broad-leaved dock, lesser burdock *Arctium minus* and greater burdock. Rare species present include hedge woundwort *Stachys sylvatica*, ivy-leaved speedwell *Veronica hederifolia*, false brome, common field speedwell *Veronica persica*, cowslip, woodruff *Galium odoratum*, violet species, wood avens, creeping thistle *Cirsium arvense*, wild teasel *Dipsacus fullonum*, wood sedge *Carex sylvatica*, Yorkshire fog *Holcus lanatus*, creeping buttercup *Ranunculus repens*, perforate St.John's wort, bristly ox-tongue *Picris echioides*, germander speedwell, elder seedlings,

bramble and Russian comfrey *Symphytum x uplandicum*. One ancient woodland indicator species was recorded: *tutsan Hypericum androsaemum*.

3.2.8 Towards the northern extent of the site (approximately 250m²), the ground flora transitions into an improved grassland habitat with abundant false oat-grass, frequent hogweed, occasional curled dock, occasional to locally abundant common nettle, plus rare broad-leaved dock and garlic mustard.

Woodland site 7

3.2.9 This block of woodland is located adjacent to the A303 to the north and grazed grassland to the south and east. A footpath runs north to south towards the eastern extent of the woodland. This woodland is approximately 10,650m² in size. Due to the frequent distribution of sycamore in the canopy layer of this woodland block, as well as the presence of hart's tongue *Phyllitis scolopendrium*, cleavers, common nettle, ivy and fox-tail feather moss, this site most resembles *W8e Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Geranium robertianum* sub-community.

3.2.10 The canopy layer (average height of 12 metre) comprises abundant ash, frequent sycamore, occasional English oak (though more frequent towards the northern extent) and rare sweet chestnut *Castanea sativa*. The sub-canopy layer (average height of 3 metre) is patchy and comprises abundant wild privet, occasional hazel, field maple and cherry laurel *Prunus laurocerasus* plus rare hornbeam *Carpinus betulus*. The ground flora quadrats comprise constant and abundant ivy and wild privet. Other constant species within the ground layer include lords-and-ladies and sycamore seedlings, though both latter species are less abundant. Hart's tongue is also present though infrequent within the woodland. Other species present within the quadrats, though as rarities, include; common nettle, ash seedlings, cleavers, enchanter's nightshade, stinking iris *Iris foetidissima*, lesser celandine, common twayblade *Listera ovata* and wood avens. Hawthorn is also present as a rarity but was present outside of the quadrat sampling. Mosses present include occasional fox-tail feather-moss and rare rough-stalked feather moss.

Woodland site 8

3.2.11 This woodland is bordered by the A303 to the south and by arable land to the north, west and east. This woodland has a very similar structure and species composition to LP7 and can be attributed to W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Geranium robertianum* sub-community. This is due to the presence of ash and sycamore in the canopy layer and field maple saplings in the sub-canopy layer, whilst ivy, cleavers, hart's tongue and common nettle are occasional to frequent in the ground flora.

3.2.12 This woodland is approximately 23,400m² in size and has evidence of past management with coppiced hazel present. A dry ditch is also present towards the northern extent of the woodland. The canopy (average height of 12 metre) comprises abundant ash, frequent to locally abundant sycamore, occasional English elm and rare false-acacia *Robinia pseudoacacia*, horse chestnut *Aesculus hippocastanum* and small-leaved lime *Tilia cordata*. The sub-canopy (average height of 5 metre) is sparse and comprises occasional hazel, elder, snowberry *Symphoricarpos albus*, hawthorn, English elm, wild privet and ivy, as well as rare dogwood, ash saplings, field maple and box *Buxus sempervirens*. One ancient woodland indicator species was recorded: small-leaved lime.

3.2.13 Ground flora quadrats include constant and locally dominant ivy. Other constant species present, though less abundant, include lesser celandine and lords-and-ladies. Less frequent species include occasional common nettle, English elm seedlings, cleavers and locally abundant dog's mercury. Infrequent species present include enchanter's nightshade and hart's tongue, whilst species rarely occurring are stinking iris, false brome, snowberry seedlings, bramble, black bryony, curled dock, pendulous sedge, ivy-leaved speedwell and wild garlic *Allium ursinum*.

3.2.14 Species recorded, but outside of the quadrats includes occasional wild privet, ash and sycamore seedlings, and rare male fern *Dryopteris filix-mas*, wood avens, common twayblade, bugle, ground-ivy, wood sedge, violet species, and hawthorn and hazel seedlings. Moss species present include constant fox-tailed feather-moss. Deadwood is frequent throughout.

Woodland site 9

3.2.15 This linear area of woodland (approximately 7,400m² in size), adjacent to the A303 and the A359 High Street, most resembles W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Geranium robertianum* sub-community. Frequent ash is present in the canopy, with rare coppiced sycamore in the sub-canopy. The canopy comprises young standards with frequent field maple, and rare (planted) Scot's pine *Pinus sylvestris*, silver birch *Betula pendula*, wild cherry *Prunus avium* and beech *Fagus sylvatica*. The sub-canopy is more open and sparse, with sycamore, holly, dogwood, hawthorn, horse-chestnut, elder, English elm and small-leaved lime all present. A small block of coppiced hazel is present in the centre of the woodland site. One ancient woodland indicator species was recorded: small-leaved lime.

3.2.16 The ground flora is sparse with bare ground frequent and constant throughout the woodland site. Ground flora quadrats comprise frequent wood avens and lords-and-ladies, locally frequent violet species, occasional bramble, black bryony, curled dock and common nettle, field maple and ash seedlings, plus rare; ground-ivy, common hogweed and false brome. Within the bryophyte

layer, common tamarisk-moss is present and frequent throughout the woodland site. Species recorded, but not within the quadrats, include rare wood sedge, stinking iris, cleavers, ivy, red campion, lungwort *Pulmonaria officinalis*, enchanter's nightshade, hawthorn seedling, and rough-stalked feather-moss.

Woodland site 10

3.2.17 This linear area of semi-natural broad-leaved woodland has been classified as a habitat of principal importance[10]. It is positioned between a hardstanding country lane to the north and an arable field (with a grassland buffer zone managed for wildlife conservation) at the southern extent. The woodland can be attributed to W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Geranium robertianum* sub-community, due to abundant ash and sycamore within the canopy layer, field maple present in the sub-canopy layer, as well as, ivy, cleavers and common nettle present within the ground layer.

3.2.18 This woodland is approximately 2,730m² in size and is sloped downwards from south to north at an average angle of 15 degrees. The canopy layer (average height of 12 metres) is comprised of abundant sycamore and ash. The sub-canopy layer (average height of 2 metres), though sparse, is species-rich and is comprised of: frequent to locally dominant ivy, occasional to locally frequent English elm, occasional hawthorn, hazel and sycamore saplings plus rare dogwood, blackthorn, yew, holly, field maple, wild privet and elder.

3.2.19 Constant species within the quadrat samples include: locally dominant ivy and dog's mercury, as well as, occasional lords-and-ladies. Other species present include: frequent cleavers and English elm saplings plus occasional common nettle and rare male fern, ash and sycamore seedlings. Several species are present outside of the ground layer quadrats, these include: rare hogweed, stinking iris, lesser celandine, as well as, wild privet and holly saplings. Bryophytes present include occasional rough-stalked feather moss, whilst deadwood is abundant throughout this woodland site.

Woodland site 12

3.2.20 A rectangular block of semi-natural broad-leaved woodland, site 12 is surrounded by arable fields. It most resembles W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Geranium robertianum* sub-community. This woodland is approximately 9,000m² in size and has a dry ditch located along the southern boundary. The canopy layer (average height of 15 metre) comprises frequent to locally abundant sycamore, occasionally to locally frequent ash and occasional English oak. The sub-canopy is sparse (average height of 2 metres) and comprises frequent ivy, occasional to locally abundant

[10] Joint Nature Conservation Committee (JNCC) (2016). *UK BAP Priority Habitats* [online] available at: from http://jncc.defra.gov.uk/page-5706 (last accessed November 2017).

snowberry, occasional English elm and elder plus rare ash saplings, field maple, holly and hazel. Within the ground layer, ivy, common nettle and lesser celandine are frequent to locally abundant. Occasional species present are lords-and-ladies, stinking iris and cleavers. Rarely occurring species include wild privet, sycamore and ash seedlings, garlic mustard, black bryony, spear thistle, broad-leaved dock, dandelion, violet species, ground ivy, common twayblade and red campion. Grass species are sparse within the ground flora, but include rough meadow-grass and false brome. Ivy, common nettle and cleavers are constant in the ground flora. Bryophytes present include occasional fox-tail feather moss and rare rough-stalked feather moss. Deadwood is abundant throughout.

Woodland site 13

3.2.21 A linear strip of semi-natural broad-leaved woodland, site 13 is located between arable fields and most resembles W8d *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Hedera helix* sub-community. This is due to the presence of ash and maple (and absence of sycamore) occurring in the canopy, as well as ivy occurring as a constant and locally abundant ground layer species. This woodland is approximately 2,600m² in size. The canopy layer (average height of 10 metre) comprises dominant ash and rare field maple, whilst the sub-canopy (average height of 10 metres) comprises frequent elder and hazel, occasional English elm and ivy plus rare field maple, holly and hawthorn. A predominantly dry stream runs from north to south within the woodland, with locally abundant hart's-tongue present on the margins of the stream.

3.2.22 Species present in the ground flora quadrats include constant and locally abundant ivy, common nettle and lesser celandine. Lords-and-ladies is constant and abundant. Frequent species include cleavers and occasional species include pendulous sedge, stinking iris, English elm saplings and ivy-leaved speedwell. Rarely occurring species include wood avens, broad-leaved dock, rough meadow-grass, enchanter's nightshade, violet species, hart's tongue, traveller's joy, herb Robert, red campion and elder saplings. Species occurring outside of the sampling area include occasional ground-ivy and rare hogweed, wood sedge, cow parsley, wood melick *Melica uniflora*, marsh horsetail *Equisetum palustre* and garlic mustard. Bryophytes present include occasional rough-stalked feather moss. Deadwood occurs occasionally throughout. One ancient woodland indicator species was recorded: wood melick.

Woodland site 16

3.2.23 This linear area of semi-natural broad-leaved woodland has been classified as a habitat of principal importance[11]. It is comprised of 2 separate woodland communities and is approximately 55,000m² in size. The woodland is actively managed area due to active coppices of hazel and sycamore with some young sycamore trees protected against damage by faunal browsing. The woodland situated towards the western extent can be attributed as W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Geranium robertianum* sub-community. The woodland situated towards the northern and eastern extent can be attributed as W12a *Fagus sylvatica-Mercurialis perennis* woodland, *Mercurialis perennis* sub-community.

3.2.24 The canopy within the W8e community 50 metre by 50 metre sample has abundant ash, as well as, rare sycamore, horse chestnut *Aesculus hippocastanum* and beech *Fagus sylvatica*. Field maple occurs occasionally within the woodland community but was not present within the sample, whilst sycamore is frequent throughout this community. Ivy, cleavers and herb Robert (the latter two species have low abundance) are constant species within the 4 metre by 4 metre quadrat sample, whilst common nettle and fox-tail feather moss are also present though less frequent. Due to the composition of plant species present, this area of woodland can be attributed to the W8e community. The sub-canopy within 50 metre by 50 metre sample is comprised of occasional hazel, rare field maple, rare hawthorn, locally frequent wild privet, as well as, rare sycamore saplings and yew. The 50 metre by 50 metre sample is an accurate representation of the sub-canopy as a whole, though sycamore saplings are generally more common as an occasional species within the woodland community.

3.2.25 The ground flora present within the 4 metre by 4 metre quadrats is typical of a W8e woodland with frequent to locally dominant dog's mercury in some areas. Constant species amongst the ground flora, other than ivy, cleavers and herb Robert, include ash and hawthorn seedlings, lords-and-ladies and bramble. Other species present within the quadrats though less frequent are: false brome, wild privet seedlings, sycamore and field maple seedlings, occasional pendulous sedge, honeysuckle, red currant, imperforate St. John's wort and rough meadow grass.

3.2.26 Species present that are rare in the community include: dandelion, violet species, stinking iris, hogweed, dog rose, lesser celandine, barren strawberry, enchanter's nightshade, English elm and dogwood seedlings. Other species present throughout the W8e community but not recorded within the quadrats

[11] Joint Nature Conservation Committee (JNCC) (2016). *UK BAP Priority Habitats* [Online]. Available at: hhttp://jncc.defra.gov.uk/page-5706 (last accessed November 2017).

include: occasional to locally frequent wood sedge, occasional lesser burdock, rare bluebell *Hyacinthoides non-scripta*, germander speedwell, black bryony, ground ivy. Numerous rides are situated within the woodland and are comprised of occasional to locally abundant rough meadow-grass, rare early dog-violet *Viola reichenbachiana*, ivy-leaved speedwell, cow parsley, garlic mustard, Yorkshire fog, hart's tongue, soft shield fern and male fern. Bryophytes present within the quadrat samples include; constant and abundant rough-stalked feather moss, frequent and abundant common tamarisk-moss and rare fox-tail feather moss.

3.2.27 The canopy within the W12a 50 metre by 50 metre sample includes abundant beech and occasional field maple. Holly is absent within the sub-canopy layer therefore W14 *Fagus sylvatica-Rubus fruticosus* woodland can be scoped out. The ground flora does not include wavy hair grass *Deschampsia flexuosa*, heather *Calluna vulgaris* or billberry *Vaccinium myrtillis* and therefore W15 *Fagus sylvatica-Deschampsia flexuosa* woodland can also be scoped out. The presence of hazel, sycamore, yew and hawthorn within the sub-canopy layer plus the presence of ivy, dog's mercury, enchanter's nightshade and false brome within the ground flora means that this area can be attributed as W12a *Fagus sylvatica-Mercurialis perennis* woodland, *Mercurialis perennis* sub-community. The sub-canopy layer within the 50 metre by 50 metre woodland is comprised of abundant wild privet, occasional hazel and sycamore saplings, as well as, rare field maple, yew and hawthorn. This layer is an accurate representation of the sub-canopy as a whole, with wild privet occurring as locally frequent throughout the community. The ground flora is less species rich than the W8e stand and is comprised of frequent ash seedlings, cleavers and lords-and-ladies, as well as, constant and abundant ivy. Dog's mercury is less frequent though is locally dominant where present. Other species occurring as rarities within the quadrats include yew and sycamore seedlings, garlic mustard, common nettle, enchanter's nightshade and violet species. Moss species present include frequent rough-stalked feather moss and common tamarisk-moss.

3.2.28 Species present within the W12a stand but not recorded within the ground flora quadrats include: occasional to locally frequent pendulous sedge, rare fox-tail feather moss, stinking iris, bramble, field maple seedlings, soft shield fern, black bryony and rhododendron.

Woodland site 17

3.2.29 This narrow semi-natural broad-leaved woodland area is positioned between 2 paddocks to the south-west and north-east of the A303 at the most northern extent and the A359 situated on the southern extent. The woodland most resembles W8d *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Hedera helix* sub-community, due to the presence of ash and field

maple within the canopy and sub-canopy, as well as ivy present as a constant and locally dominant species within the species-poor ground flora. This woodland is approximately 2,850m² in size and likely to be nutrient rich in places due to the presence of ruderal species. Occasional pendulous sedge suggests the woodland is damp. It is possible that a ditch used to exist within the central area of the woodland. This has now been filled in with soil. The canopy layer (average height of 12 metres) comprises occasional ash and English oak plus rare sycamore and silver birch. The sub-canopy (average height of 2.5 metres) is dense in places and comprises occasional to locally frequent elder and hawthorn with occasional hazel and rare field maple and wild cherry saplings.

3.2.30 The ground flora within the sampling area includes constant and locally dominant ivy. Other constant species present, though far less abundant include common nettle, lords-and-ladies, cleavers, curled dock and wood avens. Species that occur frequently include red campion, ground-ivy, dandelion and (locally abundant) violet species. Rarely occurring species are male fern, lesser celandine, herb-Robert, hart's tongue, enchanter's nightshade, and greater burdock, as well as ash, field maple and hawthorn seedlings. Bramble is rare but locally dominant where present. Species appearing outside of the quadrats include occasional wild privet seedlings and pendulous sedge, as well as rare dog rose, black bryony, tutsan, traveller's joy and the garden escape, Spanish bluebell *Hyacinthoides hispanica*. Rough-stalked feather moss is frequent as the only bryophyte present within the ground layer, whilst frequent deadwood occurs throughout the woodland. One ancient woodland indicator species, tutsan, was recorded.

3.3 Grassland sites

Grassland site 1

3.3.1 This area, approximately 12,000m² in size, is adjacent to arable land and Slate Lane. The grassland site comprises sheep-grazed unimproved grassland and most resembles MG5b *Cynosurus cristatus-Centaurea nigra grassland- Galium verum* sub-community due to the presence of constant crested dog's-tail *Cynosurus cristatus*. The grassland is more species-rich towards the western extent of the site, with numerous ant hills that suggest this area of grassland has not been ploughed in the past. The grassland is sloped downwards from south to north and has a gradient of 45 degrees in some places, though is generally lower throughout. The sward is species-rich and comprised of abundant red fescue *Festuca rubra* and cock's-foot *Dactylis glomerata* (both are constants). Other grass species present, though less abundant, are constant perennial rye-grass *Lolium perenne*, crested dog's-tail and creeping bent *Agrostis stolonifera*, frequent Yorkshire fog, quaking-grass *Briza media* and common bent *Agrostis capillaris*, yellow oat-grass *Trisetum flavescens* and false

oat-grass *Arrhenatherum elatius*. Timothy *Phleum pratense* is also present, though only occasional.

3.3.2 The composition of forbs comprises constant red clover *Trifolium pratense* and white clover *Trifolium repens*. Species present, which are indicative of unimproved grassland, are occasional fairy-flax *Linum catharticum*, occasional and locally abundant common bird's-foot-trefoil *Lotus corniculatus*, locally frequent rough hawkbit *Leontodon hispidus* and lady's bedstraw *Galium verum*, plus rare meadow vetchling *Lathyrus pratensis*, common knapweed *Centaurea nigra*, salad burnet *Sanguisorba minor* and dwarf thistle *Cirsium acaule*. Other species within the forbs composition are occasional yarrow *Achillea millefolium*, black medick *Medicago lupulina*, dandelion *Taraxacum officinale agg*., ribwort plantain *Plantago lanceolata*, creeping thistle *Cirsium arvense*, plus rare self-heal *Prunella vulgaris*, common mouse-ear *Cerastium fontanum*, mouse-ear hawkweed *Pilosella officinarum*, common hogweed *Heracleum sphondylium* and field bindweed *Convolvulus arvensis*.

3.3.3 Isolated patches of fertile open vegetation are present along the southern margins. These patches most resemble OV24a *Urtica dioica-Galium aparine* community, typical sub-community. Common nettle is constant and dominant. Other species present are constant cleavers, false-oat grass, ground-ivy, blackthorn, ash seedlings and field bindweed. None of these species are abundant within the community.

Grassland site 2

3.3.4 The western extent of this site adjacent to Traits Lane most resembles MG5b *Cynosurus cristatus-Centaurea nigra* grassland-*Galium verum* sub-community. This species-rich habitat of closed vegetation is within an area managed for a communications mast, which is either un-mown (approximately 100m²) or stock-fenced and subject to low disturbance (approximately 160m²). The sward is species-rich and comprises constant and locally dominant red fescue *Festuca rubra*, constant quaking grass *Briza media*, constant and locally abundant cock's-foot, plus rare sweet vernal-grass *Anthoxanthum odoratum*, yellow oat-grass *Trisetum flavescens*, false oat-grass, Yorkshire fog, meadow fescue *Festuca pratensis*, creeping bent and rough meadow-grass *Poa trivialis*.

3.3.5 The forbs composition is also species-rich and comprised of constant rough hawkbit, yarrow, lady's bedstraw, ribwort plantain, self-heal, greater plantain *Plantago major* and pyramidal orchid *Anacamptis pyramidalis*. Frequent species include locally abundant common bird's-foot-trefoil, field scabious *Knautia arvensis*, salad burnet and common knapweed. Other species present within the forbs composition include white clover, dandelion and common ragwort *Senecio jacobaea*, plus rare ox-eye daisy *Leucanthemum vulgare*, black medick, red clover, creeping thistle, devil's-bit scabious *Succisa pratensis*,

pignut *Conopodium majus*, blackthorn and autumn *hawkbit Leontodon autumnalis*.

3.3.6 The grassland present away from the communications mast has been recently mown and is relatively species-poor and is approximately 23,500m² in size. It is likely that this field is managed for livestock and it most resembles MG7c *Lolium perenne leys* and related grasslands, *Lolium perenne-Alopecurus pratensis-Festuca pratensis* grassland. The sward is coarse and comprises constant and locally dominant meadow fescue and constant and locally abundant red fescue. The latter species is less abundant towards the eastern extent of the site. The composition of forbs is sparse with constant dandelion *Taraxacum agg*., occasional white clover, salad burnet, field bindweed, creeping buttercup, field scabious, meadow buttercup and ribwort plantain. The vegetation is mainly closed though bare patches of earth are present towards the eastern extent of the site.

Grassland site 3

3.3.7 This area of grassland (approximately 3,200m²) directly easterly adjacent to Camel Hill Farm buildings is subject to a mowing regime towards the northern and western extent of the field. The rest of the field is unmown and is likely to be managed as set-aside grassland. The mown area most resembles MG1a *Arrhenatherum elatius* grassland, *Festuca rubra* sub-community.

3.3.8 This grassland comprises of a coarse sward with constant and frequent false oat-grass and red fescue, occasional cock's-foot and creeping bent and locally dominant Yorkshire fog. The composition of forbs species is species-poor and sparse with frequent cut-leaved crane's-bill *Geranium dissectum*, creeping thistle and hogweed, occasional cow parsley *Anthriscus sylvestris*, plus rare curled dock, common nettle, broad-leaved willowherb *Epilobium montanum*, dandelion, bristly ox-tongue *Helminthotheca echioides*, common ragwort, common vetch *Vicia sativa segetalis* and primrose *Primula vulgaris*. Common bird's-foot-trefoil is also rare but is locally abundant towards the eastern extent of the field.

3.3.9 The unmown, set-aside grassland (approximately 4,000m²) is also species-poor grassland and most resembles MG7c *Lolium perenne leys* and related grasslands, *Lolium perenne-Alopecurus pratensis-Festuca pratensis* grassland. The coarse, closed sward is comprised of constant and dominant meadow fescue, constant and locally abundant red fescue, frequent and locally abundant cock's-foot and false oat-grass, plus rare timothy *Phleum pratense* and creeping bent. The forbs are similarly species-poor with constant field bindweed, occasional common nettle and creeping thistle, plus rare common bird's-foot-trefoil and spear thistle. Of the forbs, only common bird's-foot-trefoil is abundant.

Grassland site 4

3.3.10 This roadside grass verge is along the south of the A303 at Conegore Corner and is comprised of unmanaged grassland (840m²) with encroaching patches of bramble (80m²) scrub near to Howeel Hill. The species-poor and occasionally open grassland most resembles MG1a *Arrhenatherum elatius* grassland, *Urtica dioica* sub-community. The tall sward is comprised of constant and locally dominant false oat-grass, with rare soft brome *Bromus hordeaceus* and cock's foot. Pendulous sedge is also present though rare, reflecting the shaded and damp nature of the habitat.

3.3.11 The forbs comprise constant and locally dominant common nettle, constant and abundant field bindweed, as well as frequent white dead-nettle, creeping thistle, large bindweed *Calystegia silvatica* and cleavers. Occasional marsh thistle *Cirsium palustre* and ground-ivy are also present, whilst rarities present within the forbs are upright hedge-parsley *Torilis japonica*, lords-and-ladies, cow parsley, hedge bindweed *Calystegia sepium*, hemlock *Conium maculatum*, hedge woundwort *Stachys sylvatica* and marsh woundwort *Stachys palustris*.

3.3.12 Encroaching bramble scrub is present towards the northern extent of the site. This vegetation most resembles W24b *Rubus fruticosus-Holcus lanatus* underscrub, *Arrhenatherum elatius-Heracleum sphondylium* sub-community. Bramble is constant and locally dominant. Other constants present include abundant common nettle and sparse false oat-grass. Cock's-foot is the only other grass species present though very infrequent. Other species present within this scrub habitat are occasional cleavers, field bindweed, hedge bindweed, lords-and-ladies, ground-ivy, marsh woundwort, hedge woundwort and white dead-nettle.

4 Potential impacts

4.1.1 Table 4.1 and Table 4.2 below provides a summary of the habitats subject to NVC surveys, their NVC community classification and conservation status, and the likely impacts due to the scheme.

Table 4.1: Summary of NVC surveys at woodland sites, with conservation status and likely impacts as a result of construction and operation

Woodland reference number	NVC community classification	Conservation Status	Distance from scheme	Direction from scheme	Percentage habitat lost at the site	Likely Impacts
3	W8d *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland*, Hedera helix* sub-community.	Section 41 Habitat of Principal Importance - Deciduous Mixed Woodland. Within Lindsay House Quarry, part of Downhead Manor Farm Local Wildlife Site. Nearest ancient woodland is 830m east, an Ancient Replanted Woodland.	240m	N	0	The site is 240 metres from the construction boundary and directly adjacent to a mitigation area boundary. Both direct and indirect impacts are considered unlikely.
5	NVC survey not appropriate.	Ancient Woodland Indicator Species: tutsan (*Hypericum androsaemum*). Partially within Downhead Manor Farm Local Wildlife Site. Nearest ancient woodland is 400m north-east, an Ancient Replanted Woodland.	53m	N	0	This site is 53 metres away from the construction boundary and is adjacent to a mitigation area boundary. Direct impacts are considered unlikely.
6	NVC survey not appropriate.	Ancient woodland indicator species –guelder-rose (*Viburnum opulus*) and redcurrant (*Ribes rubrum*). Nearest ancient woodland is 550m north-east.	Within scheme footprint	N/A	100%	This site is within the construction boundary. Impacts are considered certain and will include permanent habitat loss due to land take.
7	W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland*, Geranium*	Section 41 Habitat of Principal Importance - Deciduous Mixed Woodland. Within Ridge Copse Local Wildlife Site.	6m	S	0	This site is located 6m from the construction boundary. Direct impacts are considered unlikely.

Woodland reference number	NVC community classification	Conservation Status	Distance from scheme	Direction from scheme	Percentage habitat lost at the site	Likely Impacts
	robertianum sub-community.	Nearest ancient woodland is 450m south-east, an Ancient and Semi-natural Woodland.				However, indirect impacts are likely, including increased edge effects such as pollution during construction and operation.
8	W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland*, Geranium robertianum* sub-community.	Section 41 Habitat of Principal Importance - Deciduous Mixed Woodland. Ancient Woodland Indicator species: small-leaved lime (*Tilia cordata*). Partially within Hazelgrove Park Local Wildlife Site	Within scheme footprint	N/A	66%	This site is within the construction boundary. Direct impacts are considered certain and include permanent habitat loss due to land take. Indirect impacts on any remaining woodland include edge effects, such as increased effects of wind and pollution during construction and operation.
9	W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland*, Geranium robertianum* sub-community.	Section 41 Habitat of Principal Importance - Deciduous Mixed Woodland. Ancient woodland indicator sp. – small leaved lime (*Tilia cordata*). Woodland 400m north of Ancient and Semi-natural Ancient Woodland.	Partially within scheme footprint	N/A	30%	This site is partially within the construction boundary. Direct impacts are considered certain and include permanent habitat loss due to land take.

Woodland reference number	NVC community classification	Conservation Status	Distance from scheme	Direction from scheme	Percentage habitat lost at the site	Likely Impacts
						Indirect impacts are likely, including increased edge effects such as wind and pollution during construction and operation.
10	W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Geranium robertianum* sub-community	Section 41 Habitat of Principal Importance - Deciduous Mixed Woodland. Ancient woodland indicator sp. – bluebell (*Hyacinthoidies non-scripta*) Nearest ancient woodland 163m to the west is Ancient Replanted Woodland	140m	N	0	This site is 140 metres outside the construction boundary. Indirect and direct impacts are considered unlikely.
12	W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Geranium robertianum* sub-community.	Section 41 Habitat of Principal Importance - Deciduous Mixed Woodland. Nearest ancient woodland is 800m south-east, an Ancient and Semi-natural Woodland.	Adjacent to scheme boundary	N	0	This site is adjacent to the construction boundary. Direct impacts are considered unlikely. However, indirect impacts are likely, including increased edge effects such as wind and pollution during construction and operation.
13	W8d *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Hedera*	Section 41 Habitat of Principal Importance - Deciduous Mixed Woodland. Ancient woodland indicator species: wood melick (*Melica uniflora)*.	Within scheme footprint	N/A	5%	This site is partially within the construction boundary. The nearest works include the

Woodland reference number	NVC community classification	Conservation Status	Distance from scheme	Direction from scheme	Percentage habitat lost at the site	Likely Impacts
	helix sub-community.	Nearest ancient woodland is 700m south-east, an Ancient and Semi-natural Woodland.				construction of an access road. Direct impacts are considered certain and include permanent habitat loss due to land take. Indirect impacts are likely, including increased edge effects such as wind and pollution during construction and operation.
16	W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland W12a *Fagus sylvatica-Mercurialis perennis* woodland, *Mercurialis perennis* sub-community	Section 41 Habitat of Principal Importance - Deciduous Mixed Woodland. Within Parson's Steeple Local Wildlife Site Is identified as Ancient Replanted Woodland	16m	N	0	This site is 16 metres from a haul route. Indirect impacts during construction and operation are considered likely and may include increased wind and pollution during construction.
17	W8d *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland.	Section 41 Habitat of Principal Importance - Deciduous Mixed Woodland. Ancient woodland indicator species: tutsan (*Hypericum androsaemum*).	Adjacent to scheme boundary	E	0	This site is adjacent to the construction boundary, however direct impacts are considered unlikely. Indirect impacts are likely for the remaining woodland

Woodland reference number	NVC community classification	Conservation Status	Distance from scheme	Direction from scheme	Percentage habitat lost at the site	Likely Impacts
		Woodland 550m north of Ancient and Semi-natural Woodland.				of this site, including increased edge effects such as wind and pollution during construction and operation.

Table 4.2: Summary of NVC surveys at grassland sites, with conservation status and likely impacts as a result of construction and operation

Grassland reference number	NVC community classification	Conservation Status	Distance from scheme	Direction from scheme	Percentage habitat lost at the site	Likely impacts
1	MG5b *Cynosurus cristatus-Centaurea nigra grassland-Galium verum* sub-community.	Section 41 Habitat Of Principal Importance - Lowland Meadow. Near Threatened plant: quaking-grass (*Briza media*).	21m	N	0	This site is located 58m from a proposed access road and 180m from the A303 itself.. Indirect impacts are considered likely, including increased edge effects such as pollution during construction and operation.
	OV24a *Urtica dioica-Galium aparine*, Typical sub-community.	N/A	58m	N	0	
2	MG5b *Cynosurus cristatus-Centaurea nigra grassland-Galium verum* sub-community.	Section 41 Habitat of Principal Importance - Lowland Meadow. Within Camel Hill Transmitter Site, Local Near Threatened plants: quaking-grass *Briza media*, field scabious *Knautia arvensis*, devil's-bit scabious *Succisa pratensis*.	Adjacent to scheme boundary	S	0	This site is adjacent to the construction boundary. Indirect impacts are considered likely, including increased edge effects such as pollution during construction and operation.
	MG7c *Lolium perenne* leys and related grasslands, *Lolium perenne-Alopecurus pratensis-Festuca pratensis* grassland	Near Threatened plant: field scabious *Knautia arvensis*.	Adjacent	S	0	
3	MG1a *Arrhenatherum*	N/A	Within scheme footprint	N/A	44%	This site is partially within the

Grassland reference number	NVC community classification	Conservation Status	Distance from scheme	Direction from scheme	Percentage habitat lost at the site	Likely impacts
	elatius grassland, *Festuca rubra* sub-community.					construction boundary. Direct impacts are considered certain and include permanent habitat loss due to land take. Indirect impacts on any remaining grassland include edge effects, such as pollution during construction and operation
	MG7c *Lolium perenne* leys and related grasslands, *Lolium perenne-Alopecurus pratensis-Festuca pratensis* grassland.	N/A	Within scheme footprint	N/A	44	
4	MG1a *Arrhenatherum elatius* grassland, *Urtica dioica* sub-community.	N/A	Within scheme footprint	N/A	100%	This site is within the construction boundary. Direct impacts are considered certain and include permanent habitat loss due to land take.
	W24b *Rubus fruticosus-Holcus lanatus* underscrub, *Arrhenatherum elatius-Heracleum sphondylium* sub-community.	N/A	Within scheme footprint	N/A	100%	

5 Mitigation and enhancement recommendations

5.1 Construction

Direct Impacts

Permanent habitat loss

5.1.1 To facilitate the construction process, habitat clearance would involve the clearance of known areas of habitats of principal importance. Where possible, habitat loss would be avoided. Where this is not possible, in accordance with the *National Planning Policy Framework* (NPPF)[12], all losses would be adequately mitigated for.

5.1.2 The following approximate habitat losses are predicted:

- permanent loss of 0.48 hectares of broadleaved semi-natural woodland
- temporary loss of 1.15 hectares of broadleaved semi-natural woodland
- no lowland meadow is expected to fall within the construction areas

5.1.3 Where it is possible, vegetation should be reinstated as part of compensation measures as near as possible to the site of removal (but where possible, at least 100-200 metres away from the scheme, see section 5.2 below). It is recommended that for every square metre of woodland removed, habitat recreation would take place as like for like or better, with at least 2m^2 of woodland recreated off-site. Recreated habitat would be native and locally sourced, and would be maintained and monitored annually for a minimum period of 5 years for woodland, as specified in the Environmental Masterplan (Figure 2.8 of the Environmental Statement, Volume 6.2). Recreated habitat when established would aim to resemble habitat of principal importance in quality and composition. Any required management recommendations made during monitoring would be followed to ensure success of the new habitat. Consideration would be given for these compensatory habitats to be designated locally in order to protect them from future development.

5.1.4 All works effecting Section 41 habitats of principal importance would be done under a Method Statement, with supervision from an ecologist where appropriate.

[12] Department for Communities and Local Government (2012). *National Planning Policy Framework* [online] available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf (last accessed April 2018).

Disturbance

5.1.5 For habitats within the construction zone (shown as the red line boundary on the map in appendix B), construction activities such as ground investigations, equipment access, assembly areas, and provision of services and utilities, could cause temporary disturbance to existing habitats. Ground investigations would reinstate the habitats on completion. Access routes and assembly areas would be located in areas of low conservation importance, including existing hard-standing where possible. Where it is not possible to avoid habitat of conservation importance, habitats would be protected using matting and clearly defined access routes, with staff briefed on the importance of the site.

5.1.6 Environmental incidents, such as spillages, noise and emissions, would be avoided through following standard best practices guidance.

Indirect impacts to woodlands

5.1.7 There is likely to be an increase in edge effects to remaining woodlands during construction. Where trees have to be removed as part of the works, protection would be provided for the all trees to be retained within the site, using recognised methods in accordance with BS5837:2012, *Trees in relationship to design, demolition and construction – recommendations*, and this should be carried out by suitably trained personnel[13].

5.1.8 To mitigate for edge effects, development would be kept as far as possible from the woodland. A minimum buffer of at least 15 metres is recommended by Natural England[14] for ancient woodland and would be appropriate for other woodland types for this scheme. This would allow any run-off from a development to be slowed and absorbed and reduce the impact on woodland.

5.2 Operation

Indirect impacts

5.2.1 The project would involve the permanent removal of habitat and fragmentation of habitats. There are likely to be an increase in edge effects to grassland and woodland that is adjacent to the project, such as wind, air pollution and run-off. Salt spray and microclimatic effects can be caused by passing traffic within 10 metres of the road[15], and air pollution such as NOx concentrations from roads

[13] British Standards (BS) (2012). BS 5837:20120: *Trees in relation to design, demolition and construction. Recommendations*.
[14] Natural England (2017). *Standing Advice for Ancient Woodland*. Natural England; Peterborough.
[15] English Nature (2004). *The ecological effects of diffuse air pollution from road transport*. English Nature; Peterborough.

reduce to background concentrations within 100 to 200 metres from the kerbside).

5.2.2 Species-rich grassland planted adjacent to the new road scheme would be managed appropriately to reduce the impact of increased air pollution. For example, frequent mowing can help to remove nitrogen and is known to help mitigate the impact of nitrogen deposition[16].

5.3 Enhancement

5.3.1 Enhancement could include improved management of existing woodlands to enhance existing habitat. Improved management could include:

- Changes to management of ground flora and scrub layers to encourage diversity (for example, this could include clearing of invasive species, coppicing, or creation of rides).
- Additional planting of native species where required or removal of non-native species or very dominant scrub species such as bramble.
- Limit access to, deter and remove destructive species such as rabbits and deer.

5.3.2 Where semi-improved grassland is recreated or impacted, it should be seeded with a species-rich seed mix from a reputable supplier such as Emorsgate or Germinal, and managed appropriately for several years. If the grassland is used for grazing, the intensity should be decreased to allow the grassland to fully generate. Appropriate species of grazers should be used to manage undesirable grassland species.

5.3.3 Recreated woodlands should be planted with native species and structure should be managed to allow for the canopy, scrub and ground flora layers to create diversity.

5.4 Residual impacts

Construction

Permanent habitat loss and habitat fragmentation

5.4.1 Approximately 0.48 hectares of broadleaved semi-natural woodland would be permanently lost. 3.96 hectares of poor semi-improved grassland would also be lost. Approximately 4.68 hectares of woodland and 7.68 hectares of wildflower and species-rich grassland would be recreated as part of the Environmental Masterplan (Figure 2.8 of the Environmental Statement, Volume 6.3). A residual impact is the initial loss of the woodland and the time it takes for the recreated

[16] World Health Organisation (WHO) (2000). Chapter 14: *Effects of airborne nitrogen pollutants on vegetation: critical loads.*

habitat to become established. Provided the mitigation and compensation measures described above are implemented successfully, it is anticipated that overall habitat loss as a result of construction would constitute a Minor negative magnitude of impact at the local level. This would cause a Slight Adverse residual effect and would therefore be non-significant.

Temporary habitat loss

5.4.2 Temporary habitat loss will occur during construction such as ground investigations, equipment access, assembly areas, and provision of services and utilities. These are generally situated where possible, in habitat of lower conservation importance. Approximately 1.15 hectares of broadleaved semi-natural would be mitigated for by returning habitat to woodland once construction activities are complete (this is in addition to the planned habitat recreation described above). It is anticipated that disturbance would constitute a Minor negative magnitude of impact at the local level. This would cause a Slight Adverse residual effect and would therefore be non-significant.

5.4.3 Table 5.1 provides a summary of the likely residual effects during construction.

Table 5.1: Summary of residual impacts during construction

Cause	Impact	Mitigation and compensation	Magnitude of impact	Residual effect
Vegetation clearance in scheme footprint.	Loss of habitats of principal importance, including semi-natural broadleaf woodland. Fragmentation.	Habitat creation as part of scheme landscaping.	Minor	Slight Adverse
Temporary works areas, such as ground investigation, equipment access, assembly areas, and provision of services and utilities.	Temporary habitat loss.	Habitat creation.	Minor	Slight Adverse

Operation

Indirect Impacts

5.4.4 Edge effects to grassland and woodland adjacent to the scheme would be present for the life of the scheme. Appropriate management of species-rich grassland may reduce some of these effects. The effect of edge effects would constitute a Minor negative magnitude at a local level, which would result in a Slight Adverse residual effect and therefore non-significant.

5.4.5 Table 5.2 below provides a summary of the likely residual effects during operation.

Table 5.2: Summary of residual impacts during operation

Cause	Impact	Mitigation	Magnitude of impact	Residual effect
Operation of road scheme	Increased edge effects to remaining and created habitats of principal importance.	Appropriate management of habitat.	Minor negative	Slight adverse

6 Conclusion

6.1.1 Within the zone of influence of the scheme, there are 9 blocks of semi-natural woodland and 2 semi-improved and unimproved neutral grassland that are considered to be Section 41 habitats of principal importance.

6.2 Construction

6.2.1 Impacts on habitats of principal importance during construction would be mitigated through avoidance and reduction of impacts, and where this is not possible, compensated through habitat creation as part of the scheme as shown in the Environmental Masterplan (Figure 2.8 of the Environmental Statement, Volume 6.2). All works would be completed under a Method Statement. Recreated woodland habitat would be maintained and monitored for 5 years. Temporary habitat disturbance would be mitigated through careful routing of access and assembly areas in areas of low conservation importance and following recognised best practice to protect trees to be retained. Where this is not possible, use of matting and staff awareness would be used to mitigate the impact on habitats of conservation importance.

6.3 Operation

6.3.1 Impacts to habitats of conservation importance during operation would include the permanent removal of habitat, fragmentation of habitat, and increase in edge effects from road pollution. The appropriate management of habitat adjacent to the scheme would help to mitigate this impact.

6.3.2 Following the implementation of the measures proposed it is expected that any adverse impacts on habitats of conservation importance during construction and operation would be reduced, so effects on these habitats are considered non-significant.

Appendix A: SERC data map

Steart
Little Steart House
Round-leaved Fluellen
Sharp-leaved Fluellen
Corn Parsley
Broad-leaved Spurge
Spreading Hedge-parsley
Cary Fitzpaine
A37
Bluebell
River Cary
Higher Farm
Dyke Brook
Parsley Water-dropwort
Skullcap
Camel Leas
Fortyacres Farm
Nightingale Lane
Sparkford Road
Barrow
Castle View House
Woodside Villa
Common Cow-wheat
Dog Stinkhorn
Trackside Farm
A359
Upper Wood Dairy House
Hazlegrove Cottages
Mill Cottage
Sparkford Hall
High Street
Brains La
Vale Of Camelot Growers
Sparkford
Church Road
Broad-leaved Spurge
Alder Buckthorn
Greater Butterfly-orchid
Alder Buckthorn
Soft Shield-fern
Greater Butterfly-orchid
Box
Heath False-brome
Higher Farm Cottage
Annis Hill
Steart Hill Farm
Steart Hill
Vale Farm
Parson Steeple
Spurge-laurel
Mead Farm
Pyramidal Orchid
Woolly Thistle
Small Scabious
Greater Knapweed
Pyramidal Orchid
Downhead
The Spinney
Coneygore Farm
Howell Hill
Spiny Restharrow
Lesser Meadow-rue
West Camel
Fore Street
Back Street
Plowage La
Frog La
Southmead
Parsonage Road
Slow Court Manor
Chantry Lane
Hollingthorpe Lodge
Southfield Farm
Camel Hill
Spiny Restharrow
Blue Haze
Pyramidal Orchid
Woolly Thistle
Bee Orchid
Meadow Thistle
Pyramidal Orchid
Woolly Thistle
Spurge-laurel
Soft Shield-fern
Small-leaved Lime
Meadow Saffron
Higher Mead
Grass Vetchling
Eyewell
Trails La
Wales
Wales Lane
Queen Camel
Blackwell Road
High Street
Sparkford Hill
Lily-of-the-valley
Broad-leaved Helleborine
Underwoods
Meadow Cottage
Weston Bampfylde
Corton Ridge
Waverlands
Windsor Farm
Camel Farm
Camel Farm Cottages
Rectory Farm
Corn Buttercup
West Camel Road
Harsh Downy-rose
Spring Farm
Podimore
A303
B3151
Corn Parsley
Stockwitch Farm
Urgashay
Bridgehampton
Heathcote Road
Broad-leaved Spurge
Speckington
Corn Parsley
Locksley Farm House
Early Marsh-orchid
Northmead Brook
Moor
wood Farm

KEY

PROPOSED RED LINE BOUNDARY

NVC SOMERSET ENVIRONMENTAL RECORD DATA

Scale
0 500 1,000 m
1:10,000

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Project Title
A303 SPARKFORD TO ILCHESTER DUALLING

Drawing Title
NATIONAL VEGETATION CLASSIFICATION (NVC)
SOMERSET ENVIRONMENTAL RECORD DATA

Drawing Status	Suitability
Published - DEFINITION	A3

Scale	Designed	Drawn	Checked	Approved
AS SHOWN	NB	ER	VC	ER
Original Size	**Date**	**Date**	**Date**	**Date**
A1	JULY 2018	JULY 2018	JULY 2018	JULY 2018

Drawing Number
HE PIN | Originator | Volume
HE551507 - MMSJV - EBD
Location 000 | Type DR | Role LB | Number 0058

Project Ref. No. 389107

Revision C01

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

Appendix B: SERC data table

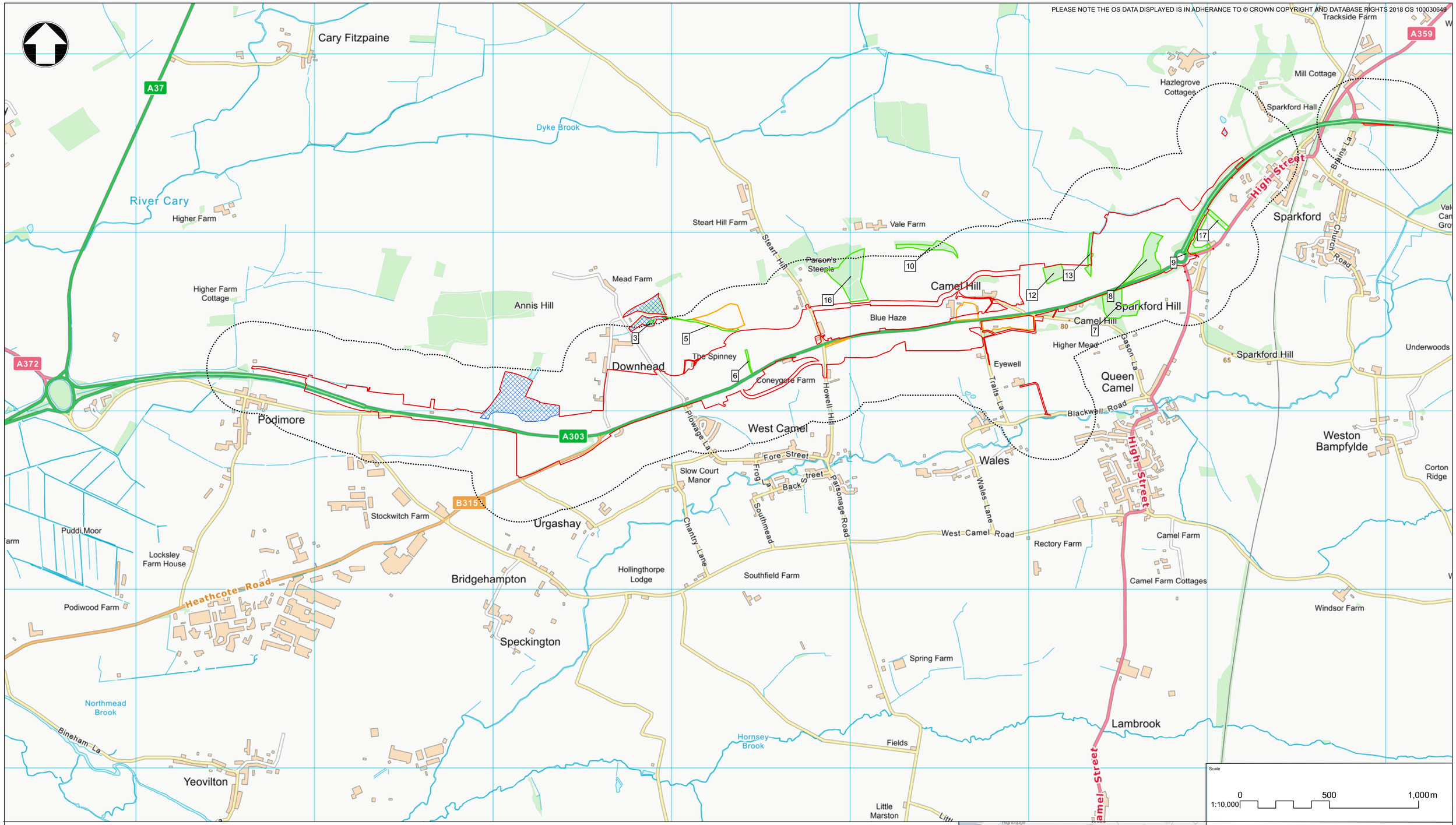
Table A.1: SECR data table

Record	Scientific name	Common name	Site location	Grid reference	Date
1	Mutinus caninus	Dog Stinkhorn	Sparkford Wood SSSI	ST613275	06/09/1994
2	Melampyrum pratense	Common Cow-wheat	Sparkford Wood SSSI	ST613275	03/03/1988
3	Daphne laureola	Spurge-laurel	Ridge Copse	ST597257	26/04/1989
4	Cirsium eriophorum	Woolly Thistle	Ridge Copse	ST597257	26/04/1989
5	Anacamptis pyramidalis	Pyramidal Orchid	Gason Lane Field	ST592255	01/01/1990
6	Frangula alnus	Alder Buckthorn	Cogberry Plantation	ST554257	09/05/1991
7	Frangula alnus	Alder Buckthorn	Bower Plantation	ST557258	09/05/1991
8	Polystichum setiferum	Soft Shield-fern	Bower Plantation	ST557258	09/05/1991
9	Scutellaria galericulata	Skullcap	Yarcombe Wood	ST583266	23/07/1992
10	Buxus sempervirens	Box	Annis Hill	ST557256	10/05/1991
11	Platanthera chlorantha	Greater Butterfly-orchid	Annis Hill	ST557256	10/05/1991
12	Epipactis helleborine	Broad-leaved Helleborine	Sparkford Hill Copse	ST603254	17/05/1991
13	Cirsium eriophorum	Woolly Thistle	Camel Hill Transmitter Site	ST588255	08/07/1991
14	Anacamptis pyramidalis	Pyramidal Orchid	Camel Hill Transmitter Site	ST588255	08/07/1991
15	Cirsium eriophorum	Woolly Thistle	Camel Hill Transmitter Site	ST588255	24/06/1992
16	Anacamptis pyramidalis	Pyramidal Orchid	Camel Hill Transmitter Site	ST588255	24/06/1992
17	Cirsium dissectum	Meadow Thistle	Gason Lane Field	ST592255	25/11/1991
18	Cirsium eriophorum	Woolly Thistle	Gason Lane Field	ST592255	25/11/1991
19	Scabiosa columbaria	Small Scabious	Lindsay House Quarry	ST568255	15/07/1992
20	Cirsium eriophorum	Woolly Thistle	Lindsay House Quarry	ST568255	15/07/1992
21	Cirsium eriophorum	Woolly Thistle	Slate Lane Fields	ST572257	14/11/1991
22	Centaurea scabiosa	Greater Knapweed	Slate Lane	ST567255	14/11/1991
23	Anacamptis pyramidalis	Pyramidal Orchid	Lindsay House Quarry	ST568255	15/07/1992
24	Blackstonia perfoliata	Yellow-wort	Lindsay House Quarry	ST568255	15/07/1992
25	Pastinaca sativa var. sativa	Wild Parsnip	Lindsay House Quarry	ST568255	15/07/1992
26	Daphne laureola	Spurge-laurel	Parson's Steeple &	ST579258	09/05/1991

Record	Scientific name	Common name	Site location	Grid reference	Date
27	Polystichum setiferum	Soft Shield-fern	Ridge Copse	ST597257	11/05/1991
28	Tilia cordata	Small-leaved Lime	Ridge Copse	ST595255	13/05/1991
29	Cirsium eriophorum	Woolly Thistle	Slate Lane Fields	ST572257	01/01/1992
30	Hyacinthoides non-scripta	Bluebell	North Somerset / Lytes Cary	ST537266	18/04/2004
31	Kickxia spuria	Round-leaved Fluellen	North Somerset / Cary Fitzpaine	ST559276	27/08/2007
32	Petroselinum segetum	Corn Parsley	North Somerset / Cary Fitzpaine	ST557275	27/08/2007
33	Euphorbia platyphyllos	Broad-leaved Spurge	North Somerset / Cary Fitzpaine	ST559276	27/08/2007
34	Kickxia elatine	Sharp-leaved Fluellen	North Somerset / Cary Fitzpaine	ST559276	27/08/2007
35	Torilis arvensis	Spreading Hedge-parsley	North Somerset / Cary Fitzpaine	ST555274	27/08/2007
36	Dactylorhiza incarnata	Early Marsh-orchid	Verge Services turn off Podimore roundabout A303	ST537240	28/06/2002
37	Anacamptis pyramidalis	Pyramidal Orchid	Slate Lane Fields	ST572257	25/06/1993
38	Ophrys apifera	Bee Orchid	North Somerset / Podimore A303/A37 roundabout	ST536252	01/07/2003
39	Anacamptis pyramidalis	Pyramidal Orchid	North Somerset / Podimore A303/A37 roundabout	ST536252	01/07/2003
40	Daphne laureola	Spurge-laurel	Parson's Steeple &	ST579258	08/02/1993
41	Anacamptis pyramidalis	Pyramidal Orchid	Lindsay House Quarry	ST568255	25/06/1993
42	Lepidium campestre	Field Pepperwort	North Somerset / Podimore	ST532254	23/05/2006
43	Convallaria majalis	Lily-of-the-valley	Weston Bampfylde.	ST604253	01/01/1985
44	Lathyrus nissolia	Grass Vetchling	Queen Camel	ST595254	01/01/1985
45	Colchicum autumnale	Meadow Saffron	Queen Camel	ST596255	01/01/1985
46	Ranunculus arvensis	Corn Buttercup	Queen Camel	ST590241	01/01/1985
47	Rosa tomentosa	Harsh Downy-rose	Marston Magna	ST590235	01/01/1985
48	Petroselinum segetum	Corn Parsley	Chilton Centello	ST564234	01/01/1985
49	Thalictrum minus	Lesser Meadow-rue	Downhead, West Camel	ST579247	01/01/1985
50	Ononis spinosa	Spiny Restharrow	Downhead,West Camel	ST579249	01/01/1985

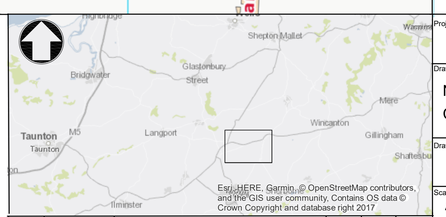
Record	Scientific name	Common name	Site location	Grid reference	Date
51	Ophrys apifera	Bee Orchid	North Somerset / Little Chef and Services, Sparkford	ST593256	01/07/2003
52	Ononis spinosa	Spiny Restharrow	Camel Hill Farm	ST587257	13/09/1988
53	Oenanthe lachenalii	Parsley Water-dropwort	Steart	ST575271	01/01/1985
54	Scutellaria galericulata	Skullcap	Yarcombe Wood, Forty Acrea Farm	ST583266	01/01/1985
55	Euphorbia platyphyllos	Broad-leaved Spurge	Cary Fitzpaine	ST557275	01/01/1985
56	Euphorbia platyphyllos	Broad-leaved Spurge	Podimore	ST553259	01/01/1985
57	Brachypodium pinnatum	Heath False-brome	Podimore	ST554254	01/01/1985
58	Platanthera chlorantha	Greater Butterfly-orchid	Podimore	ST554257	01/01/1985
59	Petroselinum segetum	Corn Parsley	Podimore	ST552247	01/01/1985
60	Euphorbia platyphyllos	Broad-leaved Spurge	RNAS Yeovilton	ST543236	01/01/1985
61	Ophrys apifera	Bee Orchid	Lytes Cary	ST530262	01/01/1985
62	Potamogeton lucens	Shining Pondweed	River Cary	ST534259	01/01/1982

Appendix C: NVC survey areas



KEY

- PROPOSED RED LINE BOUNDARY
- 200 METRE BUFFER FROM PERMANENT AND TEMPORARY LAND TAKE (EXCLUDING ECOLOGICAL RECEPTOR SITES)
- NVC GRASSLAND
- NVC WOODLAND
- LAND FOR MITIGATION PURPOSES



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

Scale: 1:10,000 (0 – 500 – 1,000 m)

Project Title: A303 SPARKFORD TO ILCHESTER DUALLING

Drawing Title: NATIONAL VEGETATION CLASSIFICATION (NVC) SURVEY AREAS

Drawing Status	Suitability
Published - DEFINITION	A3

Scale	Designed	Drawn	Checked	Approved
AS SHOWN	NB	ER	VC	ER
Original Size	**Date**	**Date**	**Date**	**Date**
A1	JULY 2018	JULY 2018	JULY 2018	JULY 2018

Drawing Number: HE551507 - MMSJV - EBD - 000 - DR - LB - 0060
(HE PIN | Originator | Volume | Location | Type | Role | Number)

Project Ref. No.: 389107

Revision: C01

Appendix D: Survey data woodland

PH2 VEGETATION SURVEY NVC, Ancient Woodland														
Ecology ID	17_PH2_180417				**Land Parcel Reference**		**17**							
Survey duration	Start 15.00				**Surveyors**	Sarah Hodgetts and Phil Newberry			**Date**	**18/04/2017**				
Weather Conditions	Dry and bright													
Broad habitat types present	Broad-leaved semi-natural woodland.													
Site and vegetation description (Include notes on management/habitat condition) and any site constraints														
Narrow strip of broad-leaved woodland adjacent to horse paddocks comprised of improved grassland. Occasional mature oaks and ash, plus fairly dense understorey. Ground flora dominated by ivy, bramble and nettle. Likely nutrient rich soil and damp in patches due to the presence of pendulous sedge. Old ditch posssibly running along centre (now filled in). Due to narrowness of habitat, likely edge effects. Abundant deadwood.														
Quadrat Reference	**1**		**2**		**3**		**4**		**5**					
Quadrat Size ² (m x m)	50x50		4x4		4x4		4x4							
Aspect	SW		SW		flat		NE							
Slope (°)	3		3		1		2							
Canopy mean height (m) and cover (%)	12	30												
Understorey mean height (m) and cover (%)	2.5	35												
Ground flora mean height (cm) and cover			10	85	35	70	15	90						
Species List (Latin Name)	**DOMIN VALUE***										**Totals**			
											Frequency	**Range**	**DAFOR****	
Canopy														
Fraxinus excelsior	5 (11-25%)										I	5	F	
Quercus robur	5 (11-25%)										I	5	O	
Acer pseudoplatanus	4 (4-10%)										I	4	R	
Betula pendula	1 <4% (few individuals)										I	1	R	
Understorey														
Corylus avellana	4 (4-10%)										I	4	O	
Sambucus nigra	4 (4-10%)										I	4	O-LF	
Crataegus monogyna	5 (11-25%)										I	5	O-LF	
Acer campestre	2 <4% (several individuals)										I	2	R	
Prunus avium	1 <4% (few individuals)										I	1	R	
Ground flora														
Hedera helix			5 (11-25%)		2 <4% (several individuals)		8 (51-75%)				III	2 to 8	F-LD	
Urtica dioica			4 (4-10%)		5 (11-25%)		5 (11-25%)				III	4 to 5	F-LA	
Arum maculatum			2 <4% (several individuals)		3 <4% (many individuals)		4 (4-10%)				III	2 to 4	O	
Galium aparine			2 <4% (several individuals)		1 <4% (few individuals)		5 (11-25%)				III	1 to 5	O	
Ligustrum vulgare (seedling)													O	
Dryopteris filix-mas					1 <4% (few individuals)						I	1	R	
Ranunculus ficaria			2 <4% (several individuals)								I	2	O-LF	
Fraxinus excelsior (seedling)					1 <4% (few individuals)						I	1	O	
Viola spp.			7 (34-50%)				4 (4-10%)				II	4 to 7	O	
Cirsium arvense					2 <4% (several individuals)						I	2	R	
Rubus fruticosus agg.					9 (76-90%)						I	9	R	
Geranium robertianum			1 <4% (few individuals)								I	1	R	
Rosa canina													R	
Tamus communis													R	
Phyllitis scolopendrium			5 (11-25%)								I	5	O-LF	
Rumex crispus			1 <4% (few individuals)		2 <4% (several individuals)		4 (4-10%)				III	1 to 4	R	
Geum urbanum			4 (4-10%)		4 (4-10%)		4 (4-10%)				III	4	O-LF	
Clematis vitalba													R	
Carex pendula													O	
Circaea lutetiana					4 (4-10%)						I	4	O	
Taraxacum agg.					1 <4% (few individuals)		1 <4% (few individuals)				II	1	R	
Arctium minus							4 (4-10%)				I	4	R	
Silene dioica			1 <4% (few individuals)		2 <4% (several individuals)						II	1 to 2	R	
Hyacinthiodes hispanica													R	
Glechoma hederacea			1 <4% (few individuals)				1 <4% (few individuals)				II	1	R	
Acer campestre (seedling)							1 <4% (few individuals)				I	1	R	
Crataegus monogyna (seedling)					1 <4% (few individuals)						I	1	R	
Hypericum androsaemum													R	
Brachythecium rutabalum			5 (11-25%)		5 (11-25%)		2 <4% (several individuals)				III	2 to 5	F	
Leaf litter-bare ground			4 (4-10%)		4 (4-10%)		4 (4-10%)				III	4	O	

*__Domin Score__: 1<4% (few individuals), 2 <4% (several individuals), 3 <4% (many individuals), 4 (4-10%), 5 (11-25%), 6 (26-33%), 7 (34-50%), 8 (51-75%), 9 (76-90%), 10 (91-100%)
**__DAFOR Scale__: Dominant, Abundant, Frequent, Ocassional, Rare.
Green - Ancient Woodland Indicator species.

PH2 VEGETATION SURVEY NVC, Ancient Woodland													
Ecology ID [1]	3_PH2_200417				Land Parcel Reference		3						
Survey duration	Start 09:00				Surveyors		Sarah Hodgetts and Phil Newberry		Date	20/04/2017			
Weather Conditions	Dry and bright												
Broad habitat types present	Broad-leaved semi-natural woodland.												
Site and vegetation description (Include notes on management/habitat condition) and any site constraints													
Small section of broad-leaved semi-natural woodland on steep undulating/uneven ground. Canopy very patchy, made of mainly ash with a dense understory. Frequent to locally abundant elder. Ground flora dominated by ivy. Common nettle and hogweed encroaching from field edge.													
Quadrat Reference	1		2		3		4		5				
Quadrat Size ² (m x m)	50x50		4x4		4x4								
Aspect	Undulating		Undulating		Uundulating								
Slope (°)	10		3		1								
Canopy mean height (m) and cover (%)	8	30											
Understorey mean height (m) and cover (%)	4	50											
Ground flora mean height (cm) and cover (%)			25	95	15	98					Totals		
Species List (Latin Name)	DOMIN VALUE*										Frequency	Range	DAFOR**
Canopy													
Fraxinus excelsior	5 (11-25%)										I	5	F
Ulmus procera	3 <4% (many individuals)										I	3	R
Crataegus monogyna	1 <4% (few individuals)										I	1	R
Acer campestre	1 <4% (few individuals)										I	1	F-LA
Understorey													
Corylus avellana	4 (4-10%)										I	4	O
Sambucus nigra	5 (11-25%)										I	5	F-LA
Ulmus procera	2 <4% (several individuals)										I	2	R
Crataegus monogyna	2 <4% (several individuals)										I	2	R
Acer campestre	2 <4% (several individuals)										I	2	R
Rosa canina	1 <4% (few individuals)										I	1	R
Cornus sanguinea	2 <4% (several individuals)										I	2	R
Hedera helix	4 (4-10%)										I	4	F
Ground flora													
Hedera helix			9 (76-90%)		10 (91-100%)						II	9 to 10	D
Urtica dioica			4 (4-10%)		4 (4-10%)						II	4	O-LA
Arum maculatum			4 (4-10%)		3 <4% (many individuals)						II	3 to 4	O
Galium aparine			2 <4% (several individuals)		4 (4-10%)						II	2 to 4	R
Sambucus nigra (seedling)			1 <4% (few individuals)								I	1	R
Ranunculus ficaria					2 <4% (several individuals)						I	2	O
Rubus fruticosus agg.													O
Glechoma hederacea													R
Brachythecium rutabalum			3 <4% (many individuals)								I	3	O
Heracleum sphondylium													R
Leaf litter-bare ground			4 (4-10%)		2 <4% (several individuals)						II	2 to 4	O

***Domin Score**: 1<4% (few individuals), 2 <4% (several individuals), 3 <4% (many individuals), 4 (4-10%), 5 (11-25%), 6 (26-33%), 7 (34-50%), 8 (51-75%), 9 (76-90%), 10 (91-100%)

****DAFOR Scale**: Dominant, Abundant, Frequent, Occasional, Rare.

PH2 VEGETATION SURVEY NVC, Ancient Woodland					
Ecology ID [1]	2_PH2_200417	**Land Parcel Reference**	**2**		
Survey duration	Start 9:30	**Surveyors**	Sarah Hodgetts and Phil Newberry	**Date**	**20/04/2017**
Weather Conditions	Cloudy, drizzle				
Broad habitat types present	Scrub, trees and hedgerow.				

Site and vegetation description (Include notes on management/habitat condition) and any site constraints

Green lane bridleway with scrub and trees either side. Species list only with DAFOR. First 200m have mature trees with dense scrub, then becomes patchy scrub towards the eastern end. Towards the east of the parcel, a there is a hedge comprised of hawthorn, elm and privet with a dry ditch.

Species List (Latin Name)	DAFOR*					
Trees						
Fraxinus excelsior	F					
Acer campestre	F					
Scrub						
Corylus avellana	O					
Sambucus nigra	F					
Ulmus procera	O-LF					
Fraxinus excelsior (saplings)	O					
Acer campestre	F					
Ligustrum vulgare	LF					
Cornus sanguinea	O					
Prunus spinosa	O					
Rosa canina	O					
Ground flora						
Hedera helix	A-LD					
Urtica dioica	O					
Arum maculatum	O					
Ulmus procera (seedling)	O-LF					
Galium aparine	O					
Sambucus nigra (seedling)	R					
Cirsium vulgare	R					
Ranunculus ficaria	O					
Hypericum perforatum	R					
Heracleum sphondylium	R					
Allaria petiolata	R					
Rubus fruticosus agg.	R					
Brachypodium sylvaticum	O					
Clematis vitalba	R					
Tamus communis	R					
Phyllitis scolopendrium	R					
Rumex crispus	R					
Geum urbanum	R					
Rumex obtusifolius	O					
Carex pendula	R					
Hypericum androsaemum	R					
Veronica hederifolia	R					
Arctium minus	R					
Glechoma hederacea	R					
Conium maculatum	R					
Geranium robertianum	R					
Prunus spinosa (seedlings)	O					
Cornus sanguinea (seedling)	O					
Silene dioica	R					
Lamium album	R					
Poa trivialis	O					
Brachythecium rutabalum	O					
Anthriscus sylvestris	O-LA					

*__DAFOR Scale__: Dominant, Abundant, Frequent, Occasional, Rare.
Green = Ancient Woodland Indicator species.

PH2 VEGETATION SURVEY NVC, Ancient Woodland							
Ecology ID [1]	6_PH2_260417			**Land Parcel Reference**	**6**		
Survey duration	Start 16:50		**Surveyors**	Sarah Hodgetts and Phil Newberry		**Date**	**26/04/2017**
Weather Conditions	bright and dry						
Broad habitat types present	Green line with hedge features. No woodland present.						
Site and vegetation description (Include notes on management/habitat condition) and any site constraints							
Green lane with tree stumps present. Full NVC woodland survey not appropriate as no wooodland habitat is present. Full sepices list and DAFOR completed for this area. East hedge has been heavily managed and cut to 1.5m. Species present include elder, blackthorn, hawthorn and ivy. West hedge with trees includes semi-mature ash with ivy, blackthorn, hawthorn and elder. Ash appears to be coppiced. The ground flora within 25m of the northern extent transitions into improved grassland with several ruderal species present. The area was probably historically a woodland strip before extensive clearance.							
Species List (Latin Name)	**DAFOR***						
Trees							
Fraxinus excelsior (both sides)	O						
Acer campestre (both sides)	O						
Salix cinerea (both sides)	R						
Viburnum opulus (west side)	R						
Scrub							
Ligustrum vulgare	O (east side) F (west side)						
Ribes rubrum (west side)	R						
Sambucus nigra (both sides)	O						
Rosa canina (west side)	R						
Clematis vitalba (east side)	R						
Ground flora							
Silene dioica	O-LF						
Taraxacum officinale agg.	O						
Galium aparine	O						
Stachys sylvatica	R						
Urtica dioica	O-LA						
Veronica hederifolia	R						
Brachypodium sylvaticum	R						
Rumex obtusifolius	O						
Veronica persica	R						
Arrhenatherum elatius	O-LA						
Arctium minus	O						
Primula veris	R						
Arum maculatum	O-LF						
Galium odoratum	R						
Viola spp.	R						
Geum urbanum	R						
Arctium minus	O						
Cirsium arvense	R						
Scrophularia nodosa	O-LF						
Rumex crispus	O-LF						
Glechoma hederacea	O-LF						
Dipsacus fullonum	R						
Circaea lutetiana	O-LF						
Carex sylvatica	R						
Holcus lanatus	R						
Ranunculus repens	R						
Hypericum perforatum	R						
Picris echioides	R						
Allaria petiolata	O-LF						
Veronica chamaedrys	R						
Sambucus nigra (seedling)	R						
Carex pendula	O-LF						
Rubus fruticosus agg.	R						
Symphytum x uplandicum	R						
Improved grassland							
Arrhenatherum elatius	A						
Heracleum sphondylium	F						
Rumex crispus	O						
Urtica dioica	O-LA						
Rumex obtusifolius	R						
Allaria petiolata	R						
Allaria petiolata	R						
*DAFOR Scale: Dominant, Abundant, Frequent, Occasional, Rare. Green = Ancient Woodland Indictor species.							

PH2 VEGETATION SURVEY NVC, Ancient Woodland																								
Ecology ID [1]	7_PH2_190417						**Land Parcel Reference**		**7**															
Survey duration	Start 09:30:00						**Surveyors**		Sarah Hodgetts and Phil Newberry						**Date**		**19/04/2017**							
Weather Conditions	Dry and bright																							
Broad habitat types present	Semi-natural broad-leaved woodland.																							
Site and vegetation description (Include notes on management/habitat condition) and any site constraints																								
Semi-natural broad-leaved woodland with mature ash and sycamore, with frequent oaks especially in northernmost section. Ivy dominates the ground flora with privet frequent in understory.																								
Quadrat Reference	**1**		**2**		**3**		**4**		**5**		**6**													
Quadrat Size [2] (m x m)	50x50		4x4		4x4		4x4		4x4		4x4													
Aspect	N+E		E		E		N		N		N													
Slope (°)	5		5		5		5		3		2													
Canopy mean height (m) and cover (%)	15	60																						
Understorey mean height (m) and cover (%)	3	20																						
Ground flora mean height (cm) and cover (%)			10	85	15	75	10	75	10	90	10	60												
Species List (Latin Name)	**DOMIN VALUE***																				**Totals**			
																					Frequency	**Range**	**DAFOR****
Canopy																								
Fraxinus excelsior	7 (34-50%)																				I	7	A	
Acer pseudoplatanus	5 (11-25%)																				I	5	F	
Quercus robur	4 (4-10%)																				I	4	O	
Castanea sativa	1 <4% (few individuals)																				I	1	R	
Understorey																								
Corylus avellana	2 <4% (several individuals)																				I	2	O	
Ligustrum vulgare	5 (11-25%)																				I	5	A	
Prunus laurocerasus	1 <4% (few individuals)																				I	1	O	
Acer campestre	3 <4% (many individuals)																				I	3	O	
Carpinus betulus	1 <4% (few individuals)																				I	1	R	
Ground flora																								
Hedera helix			8 (51-75%)		6 (26-33%)		8 (51-75%)		10 (91-100%)		7 (34-50%)										V	6 to 10	LD	
Arum maculatum			4 (4-10%)		3 <4% (many individuals)		3 <4% (many individuals)		1 <4% (few individuals)		1 <4% (few individuals)										V	1 to 4	F	
Phyllitis scolopendrium			2 <4% (several individuals)		2 <4% (several individuals)																II	2	O	
Urtica dioica					2 <4% (several individuals)																I	2	R	
Galium aparine			1 <4% (few individuals)																		I	1	R	
Acer pseudoplatanus (seedling)			3 <4% (many individuals)		3 <4% (many individuals)		1 <4% (few individuals)		2 <4% (several individuals)												IV	1 to 3	O	
Fraxinus excelsior (seedling)							1 <4% (few individuals)														I	1	O	
Circaea lutetiana					2 <4% (several individuals)																I	2	R	
Iris foetidissima			4 (4-10%)																		I	4	R	
Ranunculus ficaria			2 <4% (several individuals)																		I	2	R	
Ligustrum vulgare (seedling)			6 (26-33%)		6 (26-33%)				3 <4% (many individuals)		4 (4-10%)										IV	3 to 6	LF	
Geum urbanum			1 <4% (few individuals)																		I	1	R	
Quercus robur (seedling)							1 <4% (few individuals)														I	1	R	
Listera ovata							1 <4% (few individuals)														I	1	R	
Crataegus monogyna (seedling)																							R	
Thamnobrium alopecurum			4 (4-10%)		3 <4% (many individuals)						1 <4% (few individuals)										III	1 to 4	O	
Brachythecium rutabalum							2 <4% (several individuals)														I	2	R	
Leaf litter/bare ground			5 (11-25%)		6 (26-33%)		5 (11-25%)		4 (4-10%)		7 (34-50%)										V	4 to 7	F	

*__Domin Score__: 1<4% (few individuals), 2 <4% (several individuals), 3 <4% (many individuals), 4 (4-10%), 5 (11-25%), 6 (26-33%), 7 (34-50%), 8 (51-75%), 9 (76-90%), 10 (91-100%)
**__DAFOR Scale__: Dominant, Abundant, Frequency, Occasional, Rare.

PH2 VEGETATION SURVEY NVC, Ancient Woodland					
Ecology ID [1]	8_PH2_190417	**Land Parcel Reference**			8
Survey duration	Start 10:40	**Surveyors**	Sarah Hodgetts and Phil Newberry	**Date**	**19/04/2017**
Weather Conditions	Dry and bright				
Broad habitat types present	Semi-natural broad-leaved woodland.				
Site and vegetation description (Include notes on management/habitat condition) and any site constraints					

Semi-natural broad-leaved woodland, similar to land parcel 7. Abundant ash in canopy. Ground flora dominated by ivy, but evidence of damp ground including pendulous sedge and wild garlic. Some evidence of past management, including hazel coppicing. Evidence of old dry ditch. Frequent deadwood.

Quadrat Reference	1		2		3		4		5		6	
Quadrat Size ² (m x m)	50x50		4x4		4x4		4x4		4x4		4x4	
Aspect			NE		N		NW		flat		NW	
Slope (^{o})			3		1		2		0		3	
Canopy mean height (m) and cover (%)	12	80										
Understorey mean height (m) and cover (%)	5	10										
Ground flora mean height (cm) and cover (%)			10	90	40	90	30	90	10	95	20	95

Species List (Latin Name)	**DOMIN VALUE***						**Totals**		
	1	2	3	4	5	6	**Frequency**	**Range**	**DAFOR****
Canopy									
Fraxinus excelsior	9 (76-90%)						I	9	A
Ulmus procera	4 (4-10%)						I	4	O
Robinia pseudoacacia	1 <4% (few individuals)						I	1	R
Acer pseudoplatanus	1 <4% (few individuals)						I	1	F-LA
Aesculus hippocastanum	1 <4% (few individuals)						I	1	R
Tilia cordata	1 <4% (few individuals)						I	1	R
Understorey									
Buxus sempervirens	1 <4% (few individuals)						I	1	R
Corylus avellana	3 <4% (many individuals)						I	3	O
Sambucus nigra	2 <4% (several individuals)						I	2	O
Ulmus procera	2 <4% (several individuals)						I	2	O
Fraxinus excelsior (saplings)	1 <4% (few individuals)						I	1	R
Crataegus monogyna	4 (4-10%)						I	4	O
Acer campestre	2 <4% (several individuals)						I	2	R
Ligustrum vulgare	3 <4% (many individuals)						I	3	O
Cornus sanguinea	1 <4% (few individuals)						I	1	R
Hedera helix	2 <4% (several individuals)						I	2	O
Symphoricarpos albus	2 <4% (several individuals)						I	2	O
Ground flora									
Hedera helix		9 (76-90%)	4 (4-10%)	5 (11-25%)	6 (26-33%)	8 (51-75%)	V	4 to 9	A-LD
Mercurialis perennis			8 (51-75%)	4 (4-10%)		7 (34-50%)	III	4 to 8	A-LD
Urtica dioica		3 <4% (many individuals)	4 (4-10%)	4 (4-10%)			III	3 to 4	O
Arum maculatum		4 (4-10%)	2 <4% (several individuals)	4 (4-10%)	4 (4-10%)		IV	2 to 4	O-LF
Ulmus procera (seedling)			1 <4% (few individuals)	1 <4% (few individuals)		4 (4-10%)	III	1 to 4	O
Galium aparine		1 <4% (few individuals)	4 (4-10%)	3 <4% (many individuals)			III	1 to 4	O
Thamnobrium alopecurum		4 (4-10%)	4 (4-10%)	4 (4-10%)		4 (4-10%)	IV	4	O
Ligustrum vulgare (seedling)									O
Acer pseudoplatanus (seedling)									O
Iris foetidissima				4 (4-10%)			I	4	O
Dryopteris filix-mas									R
Ranunculus ficaria			4 (4-10%)	5 (11-25%)	4 (4-10%)	5 (11-25%)	IV	4 to 5	O-LF
Fraxinus excelsior (seedling)									O
Viola spp.									R
Corylus avellana (seedling)									R
Rubus fruticosus agg.		1 <4% (few individuals)					I	1	R
Brachypodium sylvaticum		1 <4% (few individuals)					I	1	R
Symphoricarpos albus (seedling)		1 <4% (few individuals)					I	1	O
Tamus communis		1 <4% (few individuals)					I	1	R
Phyllitis scolopendrium			3 <4% (many individuals)	3 <4% (many individuals)			II	3	O
Rumex crispus			1 <4% (few individuals)				I	1	R
Geum urbanum									R
Listera ovata									R
Carex pendula			5 (11-25%)				I	5	O
Circaea lutetiana			2 <4% (several individuals)	2 <4% (several individuals)			II	2	R
Veronica hederifolia				4 (4-10%)			I	4	R-LF
Ajuga reptans									R
Allium ursinum						1 <4% (few individuals)	I	1	O
Glechoma hederacea									R
Crataegus monogyna (seedling)									R
Carex sylvatica									R
Leaf litter-bare ground		4 (4-10%)	4 (4-10%)	4 (4-10%)	4 (4-10%)	4 (4-10%)	V	4	O

*****Domin Score**: 1<4% (few individuals), 2 <4% (several individuals), 3 <4% (many individuals), 4 (4-10%), 5 (11-25%), 6 (26-33%), 7 (34-50%), 8 (51-75%), 9 (76-90%), 10 (91-100%)
******DAFOR Scale**: Dominant, Abundant, Frequent, Occasional, Rare.
Green = Ancient Woodland Indicator species.

PH2 VEGETATION SURVEY NVC, Ancient Woodland																							
Ecology ID [1]	9_PH2_110717					**Land Parcel Reference**												9					
Survey duration	13:30-15:00					**Surveyors**		Phil Newberry and Alex Morley						**Date**				**11/07/2017**					
Weather Conditions	Wet and breezy																						
Broad habitat types present	Semi-natural broad-leaved woodland.																						
Site and vegetation description (Include notes on management/habitat condition) and any site constraints																							
Linear stretch of broad-leaved woodland directly easterly adajacent to A303 (Sparkford Bypass). Canopy comprised of young standard trees with sparse ground flora throughout. Canopy layer is dense with a very sparse sub-canopy layer. A block of coppiced hazel is present within the middle area of woodland.																							
Quadrat Reference	**1**		**2**		**3**		**4**		**5**		**6**												
Quadrat Size [2] (m x m)	50mx50m		4mx4m		4mx4m		4mx4m		4mx4m		4mx4m												
Aspect	Flat		Flat		Flat		Flat		Flat		Flat												
Slope (°)																							
Canopy mean height (m) and cover (%)	10	90							12	30													
Understorey mean height (m) and cover (%)	3	5							3.5	80													
Ground flora mean height (cm) and cover (%)			15	5	10	2	20	40	30	25	40	40											
Species List (Latin Name)	**DOMIN VALUE**																		**Totals**				
																			Frequency		**Range**		**DAFOR****
Canopy																							
Fraxinus excelsior	5 (11-25%)																		I		5		F
Fagus sylvatica	1 <4% (few individuals)																		I		1		R
Pinus sylvestris	1 <4% (few individuals)																		I		1		R
Prunus avium	3 <4% (many individuals)																		I		3		R
Betula pendula	2 <4% (several individuals)																		I		2		R
Acer campestre	7 (34-50%)																		I		7		F
Quercus petraea	4 (4-10%)																		I		4		R
Understorey																							
Acer pseudoplatanus	4 (4-10%)																		I		4		R
Ilex aquifolium	1 <4% (few individuals)																		I		1		R
Cornus sanguinea	1 <4% (few individuals)																		I		1		R
Crataegus monogyna	3 <4% (many individuals)																		I		3		R
Aesculus hippocastanum	1 <4% (few individuals)																		I		1		R
Sambucus nigra	1 <4% (few individuals)																		I		1		R
Ulmus procera	1 <4% (few individuals)																		I		1		R
Tilia cordata	1 <4% (few individuals)																		I		1		R
Corylus avellana	4 (4-10%)																		I		4		R
Ground flora																							
Rubus fruticosus agg.			1 <4% (few individuals)				4 (4-10%)				2 <4% (several individuals)								II		1 to 4		O
Arum maculatum			1 <4% (few individuals)		1 <4% (few individuals)				1 <4% (few individuals)		2 <4% (several individuals)								IV		1 to 2		F
Carex sylvatica																							R
Rumex crispus									1 <4% (few individuals)		1 <4% (few individuals)								II		1		O
Glechoma hederacea									2 <4% (several individuals)										II		2		R
Iris foetidissima																							R
Galium aparine																							R
Brachythecium rutabulum																							R
Geum urbanum			2 <4% (several individuals)				1 <4% (few individuals)		2 <4% (several individuals)										III		1 to 2		F
Viola spp.									5 (11-25%)		6 (26-33%)								II		5 to 6		LF
Hedera helix																							R
Urtica dioica									2 <4% (several individuals)		5 (11-25%)								II		2 to 5		O
Fraxinus excelsior (seedling)			3 <4% (many individuals)		2 <4% (several individuals)				2 <4% (several individuals)										III		2 to 3		O
Aesculus hippocastanum (seedling)			1 <4% (few individuals)																I		1		R
Siline dioica																							R
Pulmonaria officinalis																							R
Heracleum sphondylium											2 <4% (several individuals)								I		2		R
Brachypodium sylvaticum									1 <4% (few individuals)										I		1		R
Circaea lutetiana																							R
Prunus avium (seedling)			1 <4% (few individuals)																I		1		R
Thuidium tamariscinum					1 <4% (few individuals)		1 <4% (few individuals)		1 <4% (few individuals)										III		1		F
Acer campestre (seedling)			3 <4% (many individuals)		1 <4% (few individuals)						1 <4% (few individuals)								III		1 to 3		O
Tamus communis							2 <4% (several individuals)		1 <4% (few individuals)		1 <4% (few individuals)								III		1 to 2		O
Crataegus monogyna (seedling)																							R
Bare ground			10 (91-100%)		10 (91-100%)		8 (51-75%)												III		8 to 10		F

[*] **Domin Score**: 1<4% (few individuals), 2 <4% (several individuals), 3 <4% (many individuals), 4 (4-10%), 5 (11-25%), 6 (26-33%), 7 (34-50%), 8 (51-75%), 9 (76-90%), 10 (91-100%)
DAFOR Scale: Dominant, Abundant, Frequent, Occasional, Rare.
Green - Ancient Woodland Indicator species.

PH2 VEGETATION SURVEY NVC, Ancient Woodland

Ecology ID [1]	10_PH2_190417	**Land Parcel Reference**		10			
Survey duration	14:30	**Surveyors**	Sarah Hodgetts and Phil Newberry		**Date**	**19/04/2017**	
Weather Conditions	Dry and bright						
Broad habitat types present							

Site and vegetation description (Include notes on management/habitat condition) and any site constraints

Linear strip of semi-natural broad-leaved woodland on edge of arable field with wildlife field margin. Canopy comprises a mixture of ash and sycamore. Ground flora is dominated by ivy with abundant dog's mercury. Abundant deadwood.

Quadrat Reference	**1**		**2**		**3**		**4**		**5**		**6**			
Quadrat Size [2] **(m x m)**	50x50		4x4		4x4		4x4		4x4		4x4			
Co-ordinates														
Photo references [3]			SH		SH		SH		SH		SH			
Aspect			E		E		E		N		N			
Slope (°)			20		20		10		10		10			
Canopy mean height (m) and cover (%)	12	60												
Understorey mean height (m) and cover (%)	2	10												
Ground flora mean height (cm) and cover (%)			30	95	25	95	25	95	40	95	30	95	**Totals**	
Species List (Latin Name)	**DOMIN VALUE**												**Frequency**	**Range**
(Canopy)														
Fraxinus excelsior A	7 (34-50%)													
Acer pseudoplatanus A	7 (34-50%)													
(Sub canopy)														
Hedera helix F-LD	4 (4-10%)													
Corylus avellana O	3 <4% (many individuals)													
Sambucus nigra R	1 <4% (few individuals)													
Ulmus procera O-LF	3 <4% (many individuals)													
Acer pseudoplatanus (saplings) O	2 <4% (several individuals)													
Ilex aquifolium R	1 <4% (few individuals)													
Crataegus monogyna O	2 <4% (several individuals)													
Acer campestre R	1 <4% (few individuals)													
Ligustrum vulgare R	1 <4% (few individuals)													
Cornus sanguinea R	1 <4% (few individuals)													
Prunus spinosa R	1 <4% (few individuals)													
Taxus baccata R	1 <4% (few individuals)													
(Ground flora)														
Hedera helix D			9 (76-90%)		9 (76-90%)		8 (51-75%)		5 (11-25%)		8 (51-75%)		V	5 to 9
Mercurialis perennis A-LD			5 (11-25%)		2 <4% (several individuals)		6 (26-33%)		10 (91-100%)		7 (34-50%)		V	2 to 10
Urtica dioica R							3 <4% (many individuals)				5 (11-25%)		II	3 to 5
Arum maculatum O-LF			4 (4-10%)		4 (4-10%)				5 (11-25%)		3 <4% (many individuals)		IV	3 to 5
Ulmus procera (seedling) O			2 <4% (several individuals)		1 <4% (few individuals)						4 (4-10%)		III	1 to 4
Galium aparine O			2 <4% (several individuals)						2 <4% (several individuals)		1 <4% (few individuals)		III	1 to 2
Heracleum sphondylium R														
Ligustrum vulgare (seedling) R														
Acer pseudoplatanus (seedling) O											1 <4% (few individuals)		I	1
Iris foetidissima R														
Dryopteris filix-mas O									1 <4% (few individuals)				I	1
Ilex aquifolia (seedling) R														
Ranunculus ficaria R														
Brachythecium rutabalum F					1 <4% (few individuals)				2 <4% (several individuals)		2 <4% (several individuals)		III	1 to 2
wn moss poss. Thuidium tamarisc							1 <4% (few individuals)						I	1
Fraxinus excelsior (seedling) O			1 <4% (few individuals)										I	1
Leaf litter-bare ground O			4 (4-10%)		4 (4-10%)		4 (4-10%)		3 <4% (many individuals)		4 (4-10%)			3 to 4

***Domin Score**: 1<4% (few individuals), 2 <4% (several individuals), 3 <4% (many individuals), 4 (4-10%), 5 (11-25%), 6 (26-33%), 7 (34-50%), 8 (51-75%), 9 (76-90%), 10 (91-100%)

DAFOR Scale: Dominant, Abundant, Frequent, Occasional, Rare.

PH2 VEGETATION SURVEY NVC, Ancient Woodland

Ecology ID [1]	12_PH2_190417	**Land Parcel Reference**	**12**		
Survey duration	Start 16:30:00	**Surveyors**	Sarah Hodgetts and Phil Newberry	**Date**	**19/04/2017**
Weather Conditions	Dry and bright				
Broad habitat types present	Semi-natural broad-leaved woodland.				

Site and vegetation description (Include notes on management/habitat condition) and any site constraints

Square block of semi-natural broad-leaved woodland between arable fields. Canopy is comprised of ash and sycamore with a few standard English oaks (1m circumference). Ground flora has abundant ivy and lesser celandine, with some ruderals present including common nettle. Old dry ditch along southern boundary.

Quadrat Reference	**1**		**2**		**3**		**4**		**5**		**6**	
Quadrat Size [2] **(m x m)**	50x50		4x4		4x4		4x4		4x4		4x4	
Co-ordinates												
Photo references [3]			SH		SH		SH		SH		SH	
Aspect			N		N		N		N		N	
Slope (°)			10		5		3		5		5	
Canopy mean height (m) and cover (%)	15	70										
Understorey mean height (m) and cover (%)	2	5										
Ground flora mean height (cm) and cover (%)			50	95	25	95	40	95	25	100	40	90

Species List (Latin Name)	**DOMIN VALUE***						**Totals**		
							Frequency	**Range**	**DAFOR****
Canopy									
Fraxinus excelsior	6 (26-33%)						I	6	O-LF
Quercus robur	4 (4-10%)						I	4	O
Acer pseudoplatanus	6 (26-33%)						I	6	O-LF
Understorey									
Hedera helix	3 <4% (many individuals)						I	3	F
Corylus avellana	2 <4% (several individuals)						I	2	R
Sambucus nigra	4 (4-10%)						I	4	O
Ulmus procera	3 <4% (many individuals)						I	3	O
Acer pseudoplatanus (saplings)	4 (4-10%)						I	4	O
Ilex aquifolium	1 <4% (few individuals)						I	1	R
Crataegus monogyna	2 <4% (several individuals)						I	2	R
Acer campestre	1 <4% (few individuals)						I	1	R
Fraxinus excelsior (sapling)	1 <4% (few individuals)						I	1	R
Symphoricarpos albus	4 (4-10%)						I	4	O-LA
Ground flora									
Hedera helix		7 (34-50%)	7 (34-50%)	8 (51-75%)	8 (51-75%)	5 (11-25%)	V	5 to 8	F-LA
Iris foetidissima		3 <4% (many individuals)				2 <4% (several individuals)	II	2 to 3	O
Ranunculus ficaria			6 (26-33%)	7 (34-50%)	6 (26-33%)		III	6 to 7	A
Urtica dioica		8 (51-75%)	7 (34-50%)	8 (51-75%)	6 (26-33%)	5 (11-25%)	V	5 to 8	F-LA
Rumex obtusifolius			3 <4% (many individuals)				I	3	R
Poa trivialis					3 <4% (many individuals)		I	3	R
Carex pendula			1 <4% (few individuals)			4 (4-10%)	II	1 to 4	O
Arum maculatum		4 (4-10%)		5 (11-25%)	3 <4% (many individuals)	4 (4-10%)	IV	3 to 5	O
Circaea lutetiana		3 <4% (many individuals)	2 <4% (several individuals)				II	2 to 3	R
Galium aparine		2 <4% (several individuals)	4 (4-10%)	4 (4-10%)	5 (11-25%)	5 (11-25%)	V	2 to 5	O
Carex sylvatica									R
Listera ovata									R
Viola spp.			1 <4% (few individuals)				I	1	R
Taraxacum officinale agg.				1 <4% (few individuals)			I	1	R
Acer pseudoplatanus (seedling)				1 <4% (few individuals)		1 <4% (few individuals)	II	1	R
Tamus communis									R
Cirsium vulgare					1 <4% (few individuals)		I	1	R
Allaria petiolata									R
Silene dioica									R
Brachypodium sylvaticum					1 <4% (few individuals)		I	1	R
Glechoma hederacea					3 <4% (many individuals)		I	3	O
Brachythecium rutabalum				2 <4% (several individuals)		4 (4-10%)	II	2 to 4	R
Thuidium tamariscinum		4 (4-10%)	3 <4% (many individuals)	2 <4% (several individuals)		5 (11-25%)	IV	2 to 5	O
Fraxinus excelsior						1 <4% (few individuals)	I	1	R
Thamnobreum alopecurum				4 (4-10%)	4 (4-10%)		II	4	O
Leaf litter-bare ground		4 (4-10%)	4 (4-10%)	4 (4-10%)		4 (4-10%)	IV	4	O

*__Domin Score__: 1<4% (few individuals), 2 <4% (several individuals), 3 <4% (many individuals), 4 (4-10%), 5 (11-25%), 6 (26-33%), 7 (34-50%), 8 (51-75%), 9 (76-90%), 10 (91-100%)
**__DAFOR Scale__: Dominant, Abundant, Frequent, Occasionnal, Rare.

PH2 VEGETATION SURVEY NVC, Ancient Woodland																				
Ecology ID [1]	13_PH2_190417					**Land Parcel Reference**		**13**												
Survey duration	Start 16:30:00					**Surveyors**	Sarah Hodgetts and Phil Newberry				**Date**	**19/04/2017**							
Weather Conditions	Dry and bright																			
Broad habitat types present	Semi-natural broad-leaved woodland.																			
Site and vegetation description (Include notes on management/habitat condition) and any site constraints																				
Linear strip of semi-natural broad-leaved woodland between arable fields. Mostly dry stream runs through woodland with hart's tongue scattered on margins. Occasional deadwood. Evidence of past hazel coppice management.																				
Quadrat Reference	**1**		**2**		**3**		**4**		**5**		**6**									
Quadrat Size [2] (m x m)			4x4		4x4		4x4		4x4		4x4									
Aspect	SW		NW		N		E		flat		flat									
Slope (°)	2		4		2		2		0		0									
Canopy mean height (m) and cover (%)	10	70																		
Understorey mean height (m) and cover (%)	3	15																		
Ground flora mean height (cm) and cover (%)			40	90	30	95	25	100	15	95	30	70								
Species List (Latin Name)	**DOMIN VALUE***																**Totals**			
																	Frequency	**Range**	**DAFOR****	
Canopy																				
Fraxinus excelsior	7 (34-50%)																I	7	D	
Acer campestre	4 (4-10%)																I	4	R	
Understorey																				
Hedera helix	5 (11-25%)																I	5	O	
Corylus avellana	4 (4-10%)																I	4	F	
Sambucus nigra	4 (4-10%)																I	4	F	
Ulmus procera	2 <4% (several individuals)																I	2	O	
Acer campestre	1 <4% (few individuals)																I	1	R	
Ilex aquifolium	1 <4% (few individuals)																I	1	O	
Crataegus monogyna	2 <4% (several individuals)																I	2	R	
Ground flora																				
Galium aparine					3 <4% (many individuals)				2 <4% (several individuals)		4 (4-10%)						III	2 to 4	O-LF	
Ulmus procera (sapling)			1 <4% (few individuals)				3 <4% (many individuals)										II	1 to 3	R	
Fraxinus excelsior (sapling)			1 <4% (few individuals)				2 <4% (several individuals)										II	1 to 2	R	
Circaea lutetiana											1 <4% (few individuals)						I	1	R	
Iris foetidissima			4 (4-10%)								2 <4% (several individuals)						II	2 to 4	O	
Ranunculus ficaria			5 (11-25%)		2 <4% (several individuals)		3 <4% (many individuals)		8 (51-75%)		5 (11-25%)						V	2 to 8	A	
Geum urbanum											1 <4% (few individuals)						I	1	R	
Rumex obtusifolius							1 <4% (few individuals)										I	1	R	
Poa trivialis									2 <4% (several individuals)								I	2	R	
Carex pendula					1 <4% (few individuals)						4 (4-10%)						II	1 to 4	O	
Hedera helix			5 (11-25%)		7 (34-50%)		9 (76-90%)		5 (11-25%)		2 <4% (several individuals)						V	2 to 9	O-LF	
Urtica dioica			8 (51-75%)		7 (34-50%)		4 (4-10%)				5 (11-25%)						IV	4 to 8	F	
Arum maculatum			3 <4% (many individuals)		4 (4-10%)		3 <4% (many individuals)		5 (11-25%)		2 <4% (several individuals)						V	2 to 5	O	
Heracleum sphondylium																			R	
Viola spp.			3 <4% (many individuals)														I	3	R	
Phyllitis scolopendrium					4 (4-10%)												I	4	O-LA	
Carex sylvatica																			R	
Anthriscus sylvestris																			R	
Melica uniflora																			R	
Clematis vitalba							1 <4% (few individuals)										I	1	R	
Equisetum palustre																			R	
Veronica hederifolia									4 (4-10%)		3 <4% (many individuals)						I	3 to 4	O-LF	
Geranium robertianum									1 <4% (few individuals)								I	1	R	
Allaria petiolata																			R	
Silene dioica											2 <4% (several individuals)						I	2	R	
Sambucus nigra (sapling)											1 <4% (few individuals)						I	1	R	
Glechoma hederacea																			O	
Brachythecium rutabalum			4 (4-10%)		1 <4% (few individuals)												II	1 to 4	O	
Thuidium tamariscinum			1 <4% (few individuals)														I	1	R	
Leaf litter-bare ground			4 (4-10%)		4 (4-10%)		3 <4% (many individuals)		4 (4-10%)		5 (11-25%)						V	3 to 5	O	

*__Domin Score__: 1<4% (few individuals), 2 <4% (several individuals), 3 <4% (many individuals), 4 (4-10%), 5 (11-25%), 6 (26-33%), 7 (34-50%), 8 (51-75%), 9 (76-90%), 10 (91-100%)
**__DAFOR Scale__: Dominant, Abundant, Frequent, Occasional, Rare.
Green = Ancient Woodland Indicator species.

PH2 VEGETATION SURVEY NVC, Ancient Woodland					
Ecology ID [1]	16_PH2_270417	Land Parcel Reference	16		
Survey duration	08:45	Surveyors	Sarah Hodgetts and Phil Newberry	Date	27/04/2017
Weather Conditions	Dry and sunny				
Broad habitat types present					
Site and vegetation description (Include notes on management/habitat condition) and any site constraints					

Semi-natural broad-leaved woodland with ash and sycamore in the canopy within the western half of Steart Wood. The north and eastern half has abundant to dominant beech within the canopy layer. The beech is likely to be semi-mature standards and posibly planted. Subcanopy throughout Steart Wood is similar throughout with hazel, wild privet, field maple, dogwood and ash saplings. The planted section of woodland has young hazel and sycamore with an active sycamore and hazel coppiced areas. Trees with bark protectors (likely to minimise the effects from browsing deer). Ground flora (western half) with abundant dog's mercury and frequent bare ground. Ground flora within the beech canopy has similar structure but is less species diverse with more leaf litter. Dominant dog's mercury is present in patches though is rare elsewhere (50% of beech woodland has abundant to locally dominant dog's mercury). Dense patches of wild privet are present below the beech canopy layer.

Quadrat Reference	1		2		3		4		5		6		7		8		9		10		11		12		Totals	
Quadrat Size [2] (m x m)	50mx50m		4mx4m		4mx4m		4mx4m		4mx4m		4mx4m		50mx50m		4mx4m		4mx4m		4mx4m		4mx4m		4mx4m			
Co-ordinates																										
Photo references [3]	SH		SH		SH		SH		SH		SH		SH		SH		SH		SH		SH		SH			
Aspect	N		N		N		N		N		N		N		N		N		N		N		N			
Slope (°)	3		3		2		3		2		2		3		3		3		3		3		3			
Canopy mean height (m) and cover (%)	15	40											15	70												
Understorey mean height (m) and cover (%)	3	60											3	40												
Ground flora mean height (cm) and cover (%)			60	95	30	98	25	45	50	90	25	90			25	70	25	95	40	95	15	90	40	70		
Species List (Latin Name)	DOMIN VALUE																								Frequency	Range
(Canopy) Q1																										
Acer campestre O																										
Acer pseudoplatanus F	3 <4% (many individuals)																									
Fraxinus excelsior A	7 (34-50%)																									
Aesculus hippocastanum R	2 <4% (several individuals)																									
Fagus sylvatica R	2 <4% (several individuals)																									
Viburnum lantana R																										
(Sub canopy) Q1																										
Ligustrum vulgare F-LA	6 (26-33%)																									
Acer pseudoplatanus (sapling) O	3 <4% (many individuals)																									
Corylus avellana O	4 (4-10%)																									
Taxus baccata R	4 (4-10%)																									
Fagus sylvatica R																										
Quercus robur (sapling) R																										
Carpinus betulus R	2 <4% (several individuals)																									
Acer campestre (sapling) O	2 <4% (several individuals)																									
Ilex aquifolium R	3 <4% (many individuals)																									
Sambucus nigra R	1 <4% (few individuals)																									
Prunus spinosa R	1 <4% (few individuals)																									
Crataegus monogyna O	1 <4% (few individuals)																									
Hedera helix O	4 (4-10%)																									
Lonicera periclymenum R	1 <4% (few individuals)																									
Rhododendron ponticum R																										
Cornus sanguinea R																										
(Ground flora) Q2-6																										
Veronica hederifolia R																										
Potentilla reptans R																										
Rumex obtusifolius R											1 <4% (few individuals)														I	1
Viola spp.											1 <4% (few individuals)														I	1
Viola reichenbachiana R																										
Ulmus procera (seedling)											2 <4% (several individuals)														I	2
Anthriscus sylvestris R																										
Cornus sanguinea (seedling) R											4 (4-10%)														I	4
Iris foetidimissa R									1 <4% (few individuals)																I	1
Ajuga reptans R																										
Hedera helix F-LA			6 (26-33%)		9 (76-90%)		6 (26-33%)		7 (34-50%)		8 (51-75%)														V	6 to 9
Mercurialis perennis O																										
Ranunculus ficaria O							4 (4-10%)																		I	4
Carex pendula O					4 (4-10%)		4 (4-10%)																		II	4
Geum urbanum O			1 <4% (few individuals)		2 <4% (several individuals)		5 (11-25%)				3 <4% (many individuals)														IV	1 to 5
Rubus fruticosus agg. O			1 <4% (few individuals)		4 (4-10%)		5 (11-25%)				2 <4% (several individuals)														IV	1 to 5
Hyacinthoides non-scripta R																										
Circaea lutetiana R									3 <4% (many individuals)																I	3
Carex sylvatica O-LF																										
Rumex crispus O					1 <4% (few individuals)		1 <4% (few individuals)		2 <4% (several individuals)																III	1 to 2
Urtica dioica O-LF			4 (4-10%)		2 <4% (several individuals)				1 <4% (few individuals)																III	1 to 4
Taraxacum officinale agg. R							1 <4% (few individuals)																		I	1
Fraxinus excelsior (seedling) O			1 <4% (few individuals)		3 <4% (many individuals)		1 <4% (few individuals)		1 <4% (few individuals)		2 <4% (several individuals)														V	1 to 3
Poa trivialis O-LA			1 <4% (few individuals)				4 (4-10%)																		II	1 to 4
Listera ovata R									2 <4% (several individuals)		1 <4% (few individuals)														II	1 to 2
Crataegus monogyna (seedling) O			2 <4% (several individuals)		2 <4% (several individuals)		1 <4% (few individuals)		1 <4% (few individuals)		2 <4% (several individuals)														V	1 to 2
Arum maculatum O			1 <4% (few individuals)		1 <4% (few individuals)				2 <4% (several individuals)		2 <4% (several individuals)														IV	1 to 2
Allium ursinum O-LA																										
Primula veris R																										
Geranium robertianum O			1 <4% (few individuals)		2 <4% (several individuals)		1 <4% (few individuals)		2 <4% (several individuals)																IV	1 to 2
Heracleum sphondylium R					1 <4% (few individuals)																				I	1
Veronica chamaedrys R																										
Potentilla sterilis R					1 <4% (few individuals)																				I	1
Acer campestre (seedling) R			1 <4% (few individuals)		1 <4% (few individuals)																				II	1
Acer pseudoplatanus (seedling) O			2 <4% (several individuals)		1 <4% (few individuals)						1 <4% (few individuals)														III	1 to 2
Tamus communis R																										
Galium aparine O			3 <4% (many individuals)		2 <4% (several individuals)				1 <4% (few individuals)		2 <4% (several individuals)														IV	1 to 3
Glechoma hederacea R																										
Arctium minus O																										
Holcus lanatus R																										
Agrostis stolonifera R-LA																										
Polystichum setiferum R																										
Lonicera periclymenum R			4 (4-10%)								1 <4% (few individuals)														II	1 to 4
Allaria petiolata R																										
Phyllitis scolopedrium R																										
Ribes rubrum O					1 <4% (few individuals)						3 <4% (many individuals)														II	1 to 3
Cornus sanguinea (seedling) R-LF																										
Brachythecium rutabulum O			3 <4% (many individuals)		3 <4% (many individuals)				5 (11-25%)		3 <4% (many individuals)														IV	3 to 5
Thuidium tamariscinum O			4 (4-10%)						5 (11-25%)		4 (4-10%)														III	4 to 5
Thamnobryum alopecurum R			1 <4% (few individuals)																						I	1
Dryopteris filix mas R																										
Corylus avellana (seedling) R					1 <4% (few individuals)																				I	1
Rosa canina R					1 <4% (few individuals)																				I	1
Brachypodium sylvaticum O			2 <4% (several individuals)				2 <4% (several individuals)				2 <4% (several individuals)														III	2
Ligustrum vulgare (seedling) O-LF			8 (51-75%)		5 (11-25%)		6 (26-33%)																		III	6 to 8
Hypericum maculatum R					1 <4% (few individuals)				3 <4% (many individuals)																II	1 to 3
Bare ground			4 (4-10%)		2 <4% (several individuals)		8 (51-75%)		4 (4-10%)		4 (4-10%)															
(Canopy) Q7																										
Acer campestre O											4 (4-10%)															
Fagus sylvatica A											8 (51-75%)															
(Sub canopy) Q7																										
Ligustrum vulgare O-LF											7 (34-50%)															
Acer pseudoplatanus (sapling) O											3 <4% (many individuals)															
Corylus avellana O											4 (4-10%)															
Taxus baccata R											2 <4% (several individuals)															
Acer campestre R											2 <4% (several individuals)															
Crataegus monogyna R											1 <4% (few individuals)															
(Ground flora) Q7-12																										
Viola spp. R																					1 <4% (few individuals)				I	1
Acer pseudoplatanus (seedling) O-LF																					2 <4% (several individuals)				I	2
Allaria petiolata R																					1 <4% (few individuals)		1 <4% (few individuals)		II	1
Cornus sanguinea (seedling) R													2 <4% (several individuals)												I	2
Iris foetidimissa R																										
Acer campestre (seedling) R																										
Hedera helix F-LA													7 (34-50%)		4 (4-10%)		4 (4-10%)		8 (51-75%)		4 (4-10%)		V	4 to 8
Mercurialis perennis F-LD															10 (91-100%)		10 (91-100%)				6 (26-33%)		III	6 to 10
Ranunculus ficaria O																			1 <4% (few individuals)		3 <4% (many individuals)		II	1 to 3
Carex pendula O-LF																										
Geum urbanum O																										
Rubus fruticosus agg. R																										
Ligustrum vulgare (seedling) O-LF													4 (4-10%)				3 <4% (many individuals)				5 (11-25%)		III	3 to 5
Circaea lutetiana R																					1 <4% (few individuals)		I	1
Polystichum setiferum R																										
Urtica dioica R															3 <4% (many individuals)								I	3
Galium aparine O															2 <4% (several individuals)		3 <4% (many individuals)		2 <4% (several individuals)		4 (4-10%)		IV	2 to 4
Fraxinus excelsior (seedling) O													5 (11-25%)		2 <4% (several individuals)		1 <4% (few individuals)		2 <4% (several individuals)		1 <4% (few individuals)		V	1 to 5
Rhododendron ponticum R																										
Taxus baccata (seedling) R																					1 <4% (few individuals)		I	1
Brachypodium sylvaticum R													4 (4-10%)										I	4
Crataegus monogyna (seedling) R													1 <4% (few individuals)		1 <4% (few individuals)		1 <4% (few individuals)		1 <4% (few individuals)		1 <4% (few individuals)		V	1
Tamus communis R																										
Arum maculatum O													2 <4% (several individuals)				1 <4% (few individuals)		4 (4-10%)		1 <4% (few individuals)		IV	1 to 4
Brachythecium rutabulum O													3 <4% (many individuals)		1 <4% (few individuals)		1 <4% (few individuals)				2 <4% (several individuals)		IV	1 to 3
Thuidium tamariscinum O															1 <4% (few individuals)		2 <4% (several individuals)		1 <4% (few individuals)		1 <4% (few individuals)		IV	1 to 2
Thamnobryum alopecurum R																										
Geum urbanum O																					1 <4% (few individuals)		2 <4% (several individuals)		II	1 to 2
Bare ground/leaf litter													6 (26-33%)		4 (4-10%)		4 (4-10%)		4 (4-10%)		6 (26-33%)			

*Domin Score: 1<4% (few individuals), 2 <4% (several individuals), 3 <4% (many individuals), 4 (4-10%), 5 (11-25%), 6 (26-33%), 7 (34-50%), 8 (51-75%), 9 (76-90%), 10 (91-100%)

**DAFOR Scale: Dominant, Abundant, Frequent, Occasional, Rare.

Appendix E: Survey data grassland

Table B12: Grassland Site 1 – MG5b Community

Common name	Latin Name	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Quadrat 8	Quadrat 9	Constancy value
Perennial rye-grass	*Lolium perenne*	1	1	2	2	3	3	3	V
Crested dog's-tail	*Cynosurus cristatus*	3	4	3	1	2	4		V
Cock's-foot	*Dactylis glomerata*	4	4	6	5	4	5	4	V
Red fescue	*Festuca rubra*	4	6	6	5	7	8	7	V
White clover	*Trifolium repens*	5	5	4	2	5	4		V
Red clover	*Trifolium pratense*	5	5	2	5	2			IV
Springy turf-moss	*Rhitidiadelphus squarrosus*	1	4		2	2	1		IV
Creeping bent	*Agrostis stolonifera*		3	2		2	3	1	IV
Yorkshire fog	*Holcus lanatus*	1		1		4		1	III
Quaking-grass	*Briza media*	2	1		1				III
Common bent	*Agrostis capillaris*	5	3		5				III
Fairy flax	*Linum catharticum*	2	2		3				III
Common bird's-foot-trefoil	*Lotus corniculatus*		4	4	6	5			III
Rough hawkbit	*Leontodon hispidus*	4	4	4	4				III
Yarrow	*Achillea millefolium*	3	3		1				III
Lady's bedstraw	*Galium verum*	4	4	4		4			III
Black medick	*Medicago lupulina*	2	1		2				III
Dandelion	*Taraxacum officinale* agg.	2	1		2	1			III
Ribwort plantain	*Platago lanceolata*	2	2		2				III
Yellow oat-grass	*Trisetum flavescens*				3	2	2	1	III
Creeping thistle	*Cirsium arvense*			3			5	1	III

Table B13: Grassland Site 1 – OV24a Community

Common name	Latin Name	Quadrat 6	Quadrat 7	Quadrat 10	Constancy value
Common nettle	*Urtica dioica*	7	8	7	V
Cleavers	*Galium aparine*	2	4		IV
False oat-grass	*Arrhenatherum elatius*	2	3		IV
Ground-ivy	*Glechoma hederacea*	1	3		IV
Blackthorn	*Prunus spinosa*	1			II
Ash seedling	*Fraxinus excelsior*	1			II
Field bindweed	*Convolvulus arvensis*			1	II
Bare ground/leaf litter		7	7	7	

Table B14: Grassland Site 2 – MG5b Community

Common name	Latin Name	Quadrat 1	Quadrat 3	Quadrat 4	Quadrat 5	Quadrat 6	Constancy value
Red fescue	*Festuca rubra*	8	7	5	5	6	V
Rough hawkbit	*Leontodon hispidus*	3	4	4	4	3	V
Yarrow	*Achillea millefolium*	3	3	3	3	3	V
Lady's bedstraw	*Galium verum*	2	3	2	3	3	V
Ribwort plantain	*Plantago lanceolata*	2	4		3	2	IV
Self-heal	*Prunella vulgaris*	2		1	3	2	IV
Quaking-grass	*Briza media*		2	3	3	3	IV
Cock's-foot	*Dactylis glomerata*		3	6	5	6	IV
Greater plantain	*Plantago major*		5	4	2	3	IV
Pyramidal orchid	*Anacamptis pyramidalis*		1	4	1	2	IV
Common bird's-foot-trefoil	*Lotus corniculatus*			6	3	4	III
Field scabious	*Knautia arvensis*	4	3		2		III
Salad burnet	*Sanguisorba minor*		5		4	4	III
Common knapweed	*Centaurea nigra*	5		3	2		III
Sweet vernal-grass	*Anthoxanthum odoratum*				1	1	II
Yellow oat-grass	*Trisetum flavescens*	2			4		II
White clover	*Trifolium repens*	4			1		II
Dandelion	*Taraxacum officinale* agg.	1		2			II
False oat-grass	*Arrhenatherum elatius*	3			2		II
Yorkshire fog	*Holcus lanatus*		3	3			II
Common ragwort	*Senecio jacobaea*			2		1	II

Common name	Latin Name	Quadrat 1	Quadrat 3	Quadrat 4	Quadrat 5	Quadrat 6	Constancy value
Ox-eye daisy	*Leucanthemum vulgare*		2			1	II
Meadow fescue	*Festuca pratensis*		3			2	II
Black medick	*Medicago lupulina*				1		I
Red clover	*Trifolium pratense*					3	I
Creeping bent	*Agrostis stolonifera*	2					I
Creeping thistle	*Cirsium arvense*				1		I
Devil's-bit scabious	*Succisa pratensis*	3					I
Rough meadow-grass	*Poa trivialis*		1				I
Pignut	*Conopodium majus*		2				I
Blackthorn	*Prunus spinosa*	4					I
Autumn hawkbit	*Leontodon autumnalis*	3					I

Table B15: Grassland Site 2 – MG7c Community

Common name	Latin Name	Quadrat 2	Quadrat 7	Quadrat 8	Quadrat 9	Quadrat 10	Constancy value
Meadow fescue	*Festuca pratensis*	7	7	8	9	6	V
Red fescue	*Festuca rubra*	7	4	5	4		IV
Dandelion	*Taraxacum officinale* agg.	4	3	2		3	IV
White clover	*Trifolium repens*	2			1		II
Salad burnet	*Sanguisorba minor*				2	1	II
Field bindweed	*Convolvulus arvensis*				1	1	II
Creeping buttercup	*Ranunculus repens*	1					I
Field scabious	*Knautia arvensis*		1				I
Meadow buttercup	*Ranunculus acris*		1				I
Ribwort plantain	*Plantago lanceolata*					1	I
Bare ground/ leaf litter						7	

Table B16: Grassland Site 3 – MG1a Community

Common name	Latin Name	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Constancy value
False oat-grass	*Arrhenatherum elatius*	4	3		4	3	IV
Field bindweed	*Convolvulus arvensis*	6		3	2	2	IV
Red fescue	*Festuca rubra*	5			5	6	III
Cut-leaved crane's-bill	*Geranium dissectum*	1			2	2	III
Creeping thistle	*Cirsium arvense*	2	2	2			III
Hogweed	*Heracleum sphondylium*			2	1	2	III
Cock's-foot	*Dactylis glomerata*	6			6		II
Creeping bent	*Agrostis stolonifera*		3	4			II
Cow parsley	*Anthriscus sylvestris*	1			2		II
Yorkshire fog	*Holcus lanatus*		9	4			II
Curled dock	*Rumex crispus*	2					I
Common nettle	*Urtica dioica*		4				I
Broad-leaved willowherb	*Epilobium montanum*		1				I
Dandelion	*Taraxacum officinale* agg.			2			I
Bristly ox-tongue	*Picris echioides*				1		I
Common ragwort	*Senecio jacobaea*				2		I
Common vetch	*Vicia sativa*				1		I
Common bird's-foot-trefoil	*Lotus corniculatus*					6	I
Primrose	*Primula vulgaris*				1		I

Table B17: Grassland Site 3 – MG7c Community

Common name	Latin Name	Quadrat 6	Quadrat 7	Quadrat 8	Quadrat 9	Quadrat 10	Constancy value
Meadow fescue	*Festuca pratensis*	9	10	8	9	6	V
Field bindweed	*Convolvulus arvensis*	5	2	3	2	5	IV
Red fescue	*Festuca rubra*	5	4	3	7		IV
Cock's-foot	*Dactylis glomerata*		4	2	3		III
False oat-grass	*Arrhenatherum elatius*		1	3	2		III
Common nettle	*Urtica dioica*		2	1			II
Creeping thistle	*Cirsium arvense*			1	1		II
Timothy	*Phleum pratense*					1	I
Creeping bent	*Agrostis stolonifera*					1	I
Common bird's-foot-trefoil	*Lotus corniculatus*					6	I
Spear thistle	*Cirsium vulgare*					1	I

Table B18: Grassland Site 4 – MG1b Community

Common name	Latin Name	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 7	Quadrat 8	Quadrat 9	Quadrat 10	Constancy value
False oat-grass	*Arrhenatherum elatius*	9	4	4	9	5	7	8	V
Common nettle	*Urtica dioica*	1	8	7	4	9	5	5	V
Field bindweed	*Convolvulus arvensis*	4	4	2	1		1	4	V
White dead-nettle	*Lamium album*	2		1			1	1	III
Creeping thistle	*Cirsium arvense*	1		1	1		2		III
Cleavers	*Galium aparine*		1	4			1	1	III
Large bindweed	*Calystegia silvatica*				3		3	4	III
Ground-ivy	*Glechoma hederacea*			2			5		II
Marsh thistle	*Cirsium palustre*						2	1	II
Pendulous sedge	*Carex pendula*	2							I
Upright hedge-parsley	*Torilis japonica*				1				I
Lords-and-ladies	*Arum maculatum*			2					I
Cow parsley	*Anthriscus sylvestris*				1				I
Bramble	*Rubus fruticosus agg.*				1				I
Hedge bindweed	*Calystegia sepium*					3			I
Soft brome	*Bromus hordeaceus*	1							I
Cock's-foot	*Dactylis glomerata*	4							I
Hemlock	*Conium maculatum*	2							I
Marsh woundwort	*Stachys palustris*						1		I
Hedge woundwort	*Stachys sylvatica*						1		I
Bare ground/leaf litter				8			4		II

Table B19: Grassland Site 4 – W24b Community

Common name	Latin Name	Quadrat 4	Quadrat 5	Quadrat 6	Constancy value
False oat-grass	*Arrhenatherum elatius*	3	2	1	V
Common nettle	*Urtica dioica*	6	6	5	V
Bramble	*Rubus fruticosus* agg.	2	8	10	V
Cleavers	*Galium aparine*			1	II
Field bindweed	*Convolvulus arvensis*		5		II
Hedge bindweed	*Calystegia sepium*			2	II
Cock's-foot	*Dactylis glomerata*	1			II
Lords-and-ladies	*Arum maculatum*	1			II
Ground-ivy	*Glechoma hederacea*	4			II
Marsh woundwort	*Stachys palustris*		1		II
Hedge woundwort	*Stachys sylvatica*		1		II
White dead-nettle	*Lamium album*	1			II
Bare ground/leaf litter		8			I

B.20 Grassland Site 5 – MG5a Community

Common name	Latin Name	Quadrat 3	Quadrat 4	Quadrat 6	Quadrat 7	Quadrat 8	Constancy value
Meadow Fescue	*Festuca pratensis*	5	4	2	2	2	V
Yorkshire Fog	*Holcus lanatus*	4	4	4	4	3	V
Soft Rush	*Juncus effusus*	2	2	2	4	3	V
Common Fleabane	*Pulicaria dysentrica*	6	5	8	7	8	V
Creeping Bent	*Agrostis stolonifera*	2	2	3		4	IV

Tufted Vetch	*Vicia cracca*		4	3	2	2	IV
Meadow Vetchling	*Lathyrus pratensis*	3	3		4	2	IV
Marsh Thistle	*Cirsium palustre*	1	3		2	3	IV
Devil's-bit Scabious	*Succisa pratensis*	2	3	4	2		IV
Timothy	*Phleum pratense*		1	1	3	4	IV
Red Fescue	*Festuca rubra*	2			4	4	III
Agrimony	*Agrimonia eupatoria*	4		3		1	III
Common Knapweed	*Centaurea nigra*	1	4			4	III
Betony	*Stachys officinalis*	3			2	2	III
Creeping Cinquefoil	*Potentilla reptans*	2		1	2		III
False-fox Sedge	*Carex otrubae*		1	3	4		III
Saw-wort	*Serratula tinctoria*	2	1				II
Pignut	*Conopodium majus*		2			3	II
Sweet Vernal-grass	*Anthoxanthum odoratum*			2		1	II
Hard Rush	*Juncus inflexus*				2	2	II
Wood Dock	*Rumex sanguineus*	2			2		II

Appendix F: Survey photos

Site	Quadrat	Photograph
Wood 3	**1**	
Wood 3	**2**	

Wood 5	**N/A**	
Wood 6	**N/A**	

Wood 7	**2**	
Wood 7	**3**	

Wood 7	**4**	
Wood 7	**5**	

Wood 7	**6**	
Wood 8	**3**	

Wood 8	**4**	
Wood 8	**5**	

Wood 8	**6**	
Wood 9	**2**	

Wood 9	**3**	
Wood 9	**4**	

Wood 9	**5**	
Wood 9	**6**	
Wood 10	**1**	**No photo**

Wood 12	**2**	
Wood 12	**3**	

Wood 12	**4**	
Wood 12	**5**	

Wood 12	**6**	
Wood 13	**2**	

Wood 13	**3**	
Wood 13	**4**	

Wood 13	**5**	
Wood 13	**6**	

Wood 16	**2**	
Wood 17	**2**	

Wood 17	**3**	
Wood 17	**4**	

Grass 1-MG5b	**1**	
Grass 1-MG5b	**2**	

Grass 1-MG5b	**3**	
Grass 1-MG5b	**4**	

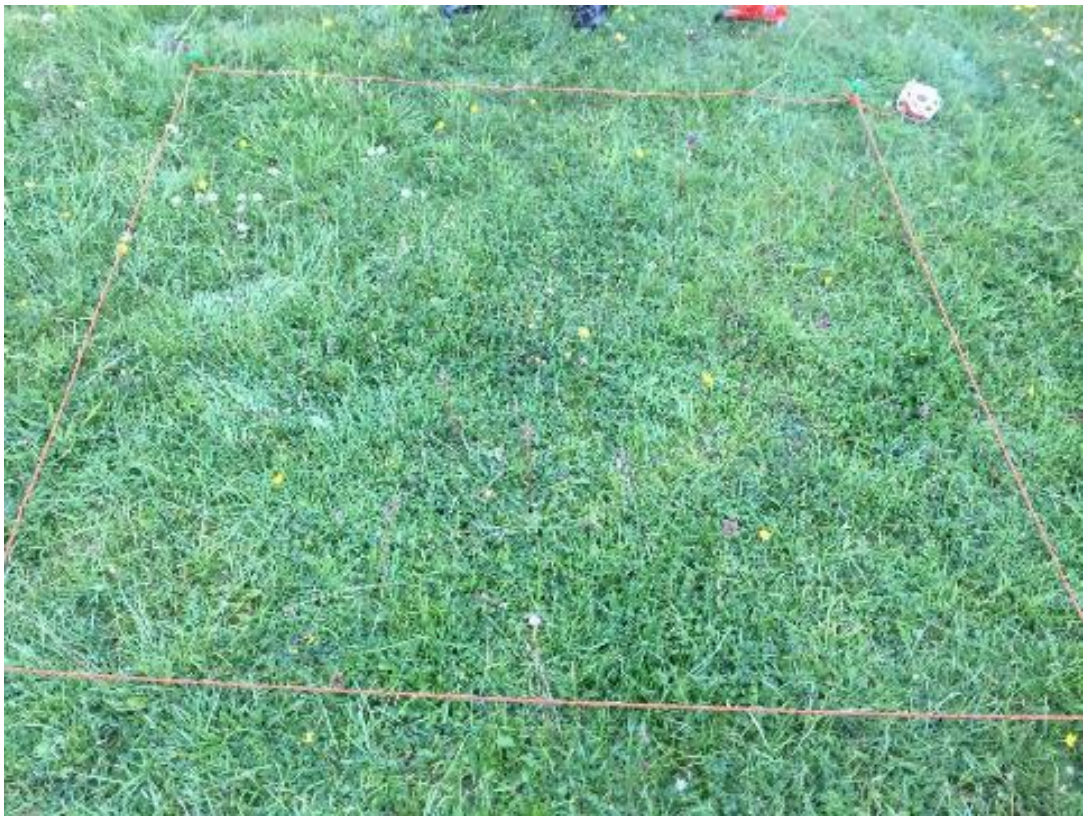
Grass 1-MG5b	**5**	
Grass 1-MG5b	**8**	

Grass 1- MG5b	**9**	
Grass 1- OV24a	**6**	

Grass 1-OV24a	**7**	
Grass 1-OV24a	**10**	

Grass 2-MG5b	**1**	
Grass 2-MG5b	**3**	

Grass 2-MG5b	**4**	
Grass 2-MG5b	**5**	

Grass 2-MG5b	**6**	
Grass 2-MG7c	**2**	

Grass 2-MG7c	**7**	
Grass 2-MG7c	**8**	

Grass 2-MG7c	**9**	
Grass 2-MG7c	**10**