

# **M25 junction 10/A3 Wisley interchange TR010030**

## **6.5 Environmental Statement: Appendix 7.5 National vegetation classification**

Regulation 5(2)(a)  
Planning Act 2008

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



## **Infrastructure Planning**

### **Planning Act 2008**

#### **The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)**

### **M25 junction 10/A3 Wisley interchange**

#### **The M25 junction 10/A3 Wisley interchange Development Consent Order 202[x ]**

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### **6.5 ENVIRONMENTAL STATEMENT: APPENDIX 7.5 NATIONAL VEGETATION CLASSIFICATION**

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# **Appendix 7.5**

## **National Vegetation Classification**

## 7.1 Vegetation and notable plants

### 7.1.1 Introduction

- 7.1.1.1 The M25 Junction 10/A3 Wisley interchange improvements Scheme is located on the route of the A3 where it crosses an area that formerly consisted of extensive heathland. The existing habitats around the M25 junction 10/A3 Wisley interchange (hereafter referred to as 'the junction') include dry and wet heath habitat, bog, open water, secondary woodland, and scrub; and the area is designated as Ockham and Wisley Commons Site of Special Scientific Interest (SSSI). The SSSI south of the M25 (either side of the A3) is designated as part of the Thames Basin Heaths Special Protection Area (SPA).
- 7.1.1.2 The vegetation survey describes the vegetation communities of notable habitats<sup>1</sup> and ancient woodlands within and adjacent to the Scheme. Vegetation communities are formed of groups of species that are known to co-exist together; and several different vegetation communities may form a habitat. The surveys used the National Vegetation Classification (NVC)<sup>2</sup>. The NVC is the standard method for describing and classifying British plant communities.
- 7.1.1.3 During the vegetation survey, a search was made for notable plants known to be present close to the Scheme from biological records.

### 7.1.2 Objectives

- 7.1.2.1 The objective of the vegetation survey was to identify and classify the vegetation communities within notable habitats and ancient woodlands within or adjacent to the Scheme.
- 7.1.2.2 The objective of the notable plant survey was to establish the presence of notable plants identified as being within or adjacent to the Scheme from biological records.

### 7.1.3 Methodology

#### Survey area

- 7.1.3.1 The vegetation survey covered the land within the Scheme and immediately adjacent to it (i.e. abutting the Scheme), focussing on terrestrial notable habitats and ancient woodland. The search for notable plants was carried out within the Scheme and at locations identified during desk study up to 500 m from the Scheme.

#### Vegetation survey

- 7.1.3.2 Notable habitats were identified and located based on the results of the Phase 1 Habitat Survey (see Figure 7.2) and were primarily located within the SSSI on all sides of the junction. Three ancient woodlands were identified adjacent to the Scheme during the desk study. The ancient woodlands surveyed are outside the SSSI.

<sup>1</sup> Habitats of Principal Importance, as listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006).

<sup>2</sup> Rodwell, J.S. (ed.) (1990 *et seq.*) *British Plant Communities*, Volumes 1-5. Cambridge University Press.



- 7.1.3.3 The vegetation survey encompassed the following notable habitats within the Scheme and immediately adjacent to it:
- Lowland heathland;
  - Wood-pasture and parkland;
  - Lowland mixed deciduous woodland; and
  - Ponds.
- 7.1.3.4 The vegetation survey of notable habitats within the SSSI was carried out over four days 27th, 28th and 29th July and 24th August 2016.
- 7.1.3.5 Ancient woodlands were surveyed where there was potential for direct impacts (this was later ruled out for Hatchford Wood but the data is still provided in this appendix). Three ancient woodlands were surveyed, two which are located within the Scheme, and one immediately adjacent to it:
- Woodland at Heyswood Girl Guide Camp (two woodland parcels, centred at grid ref. TQ089602 and TQ092604) located partially within the Scheme;
  - Elm Corner Wood (central grid ref. TQ065577) located partially within the Scheme; and
  - Hatchford Wood (central grid ref. TQ088583) located adjacent to the Scheme.
- 7.1.3.6 The locations of the woodland surveyed are shown on Figure 7.6.
- 7.1.3.7 The woodland at Heyswood Girl Guide Camp is split into two sections, separated by an enclosed gas compound, and was surveyed over two days. This southern part of the woodland (south-west of the gas compound, grid ref. TQ089602) was surveyed on the 26 September 2017. The northern section of the woodland (north-east of the gas compound, grid ref. TQ092604) was surveyed on 15 May 2018.
- 7.1.3.8 Hatchford Wood and Elm Corner Wood were surveyed on 3 May 2018.
- 7.1.3.9 At the start of the survey, similar vegetation assemblages, known as homogenous stands, were identified, that could define a particular community. Where it was clear that a homogenous stand was formed of a single community, then that community was sampled. Where there was doubt, then comparisons were made with similar vegetation within the habitat until homogenous stands could be better defined. Samples were taken across homogenous stands of vegetation, to be classified following data analysis.
- 7.1.3.10 The vegetation communities were sampled by identifying all plant species present within sample plots (quadrats) at specific locations within the habitat. The quadrat locations were selected to give a representative sample of each community. The edge of communities or locations where there was clear zonation between communities were avoided. Physical parameters such as slope, aspect, pH and soil depth were recorded for each quadrat location.

- 7.1.3.11 Where possible, a minimum of five quadrats were sampled within each homogenous stand of vegetation. Where this was not possible (*i.e.* a stand was too small to fit five quadrats), then less samples were taken. In some stands quadrats were not sampled for a community, but the community has been identified from surveyor experience. The size of the quadrats used varied dependant on the habitat – for heathland, mire and pond margin habitats 2 m x 2 m quadrats were used; for woodland ground flora 5 m x 5 m quadrats were used.
- 7.1.3.12 For the ancient woodlands Elm Corner Wood and Hatchford Wood, a single sample of the canopy species was taken based on the abundance of trees within the whole woodland canopy, whereas five 5 m x 5 m sample quadrats were taken of ground flora within the woodlands. The locations of the quadrats are shown on Figure 7.6.
- 7.1.3.13 Plant species were identified and listed and their abundance within the quadrat recorded using the Domin scale of percentage cover across the quadrat (see Table 7.1.1).

**Table 7.1.1: The Domin scale of cover/abundance**

Domin value	% cover
1	<4% (few individuals)
2	<4% (few 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%

- 7.1.3.14 Following the survey, the frequency that a species occurred during sampling of a homogenous stand was calculated and given a value between 1 and 5.
- 7.1.3.15 Table 7.1.2 gives the frequency values and the range of samples that a species appears in for each value as a percentage. Where more than five samples were taken, then the frequency value was calculated from the percentage of quadrat samples a species occurred in based on

**Table 7.1.2: Frequency values**

Frequency class	% frequency across samples	Description
I	1–20%	Scarce
II	21–40%	Occasional
III	41–60%	Frequency
IV	61-80%	Constant
V	81-100%	Constant

- 7.1.3.16 The data for each homogenous stand was then compiled in NVC floristic tables with species listed alongside the frequency value (shown as a Roman numeral) and abundance scores (as a range from the lowest to highest Domin value). The data recorded was used to determine the community based on the published descriptions of NVC communities. The floristic tables were compared against the community floristic tables in the NVC handbooks, and the keys within the handbooks were also used. The 'best fit' to published descriptions of NVC communities was sought. Summary floristic tables are provided in the results section below.
- 7.1.3.17 The classification was aided by the use of the computer programme MATCH, which uses a coefficient to calculate the similarity of samples to NVC communities on a scale of 0 to 100. The similarity coefficient values give an approximation of the closeness of fit for a sampled vegetation to the defined communities in the NVC handbooks. The MATCH coefficient values are provided for each vegetation community sampled.

### Notable flora survey

- 7.1.3.18 During the vegetation survey, a search was made for species of notable plants of which there are existing records from within the Scheme or 500 m from it, identified during the desk study. This was to confirm the current status (presence or absence; and abundance if present) of plants. The species identified during the desk study that were subject to this search are listed along with their status in Table 7.1.3 below.

**Table 7.1.3: Notable plants species identified during the desk study.**

Scientific name	Common name	Status
<i>Deschampsia setacea</i>	Bog hair grass	Vulnerable (England) <sup>3</sup> , Nationally scarce
<i>Baldellia ranunculoides</i>	Lesser water plantain	Vulnerable (England)
<i>Eleocharis multicaulis</i>	Multi-stemmed spike-rush	County scarce (Surrey)
<i>Erica tetralix</i>	Cross-leaved heather	Near Threatened (England)
<i>Osmunda regalis</i>	Royal fern	County scarce (Surrey)

### Survey limitations

- 7.1.3.19 The botanical survey focussed on areas of notable habitat outside of the highway boundary and did not include areas of notable habitat located on the verge of the M25, A3 or the slip-roads of the junction. This was because these locations could not be sampled in detail safely. However, the vegetation sampling undertaken is considered sufficient to identify the main vegetation communities present (including those which extend onto the motorway and highway verges).

<sup>3</sup> As listed in the Stroh, P.A., *et al.* (2014) *A Vascular Plant Red List for England*. Botanical Society of Britain and Ireland, Bristol.



7.1.3.20 Botanical surveys are limited by factors which affect the presence of plants such as the time of year and weather conditions. Therefore, the survey may not have produced a complete list of plants present within the habitats, and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. One ancient woodland survey was undertaken in September, but while this may mean some spring-flowering ground flora were not visible the survey was still sufficient to indicate the NVC community. Otherwise, the surveys were undertaken at an optimal time of year for identifying the majority of plant species.

## 7.1.4 Results

### Vegetation survey

#### Lowland heathland

##### *Dry heath*

7.1.4.1 Lowland heathland habitat is predominately located adjacent to the Scheme to the south of Junction 10, on both sides of the A3. However, lowland heathland (invaded by scrub and trees) is also present either side of the M25 west of the junction, partly within the Scheme.

7.1.4.2 Lowland heathland habitat was sampled at three locations, with a total of 14 quadrat samples. The three locations were: established heath at Ockham Common south-east of the junction; regenerating heath in a cleared area at Ockham Common south east of the junction; and established heath in a glade north-west of the junction. A summary floristic table of the results showing the frequency across the 14 samples and range of abundance is shown in Table 7.1.4 below.

**Table 7.1.4: NVC summary floristic table for dry heath**

Species list	Frequency	Abundance
<i>Calluna vulgaris</i>	V	1-8
<i>Erica cinerea</i>	IV	1-9
<i>Deschampsia flexuosa</i>	IV	1-7
<i>Hypnum jutlandicum</i>	III	4-8
<i>Pteridium aquilinum</i>	III	1-8
<i>Pinus sylvestris</i> (seed/sap)	III	1-5
<i>Campylopus introflexus</i>	II	1-9
<i>Pseudoscleropodium purum</i>	II	2-5
<i>Dicranium scoparium</i>	II	2-4
<i>Rubus fruticosus</i> agg.	II	1-2
<i>Ulex minor</i>	I	8
<i>Calliergonella cuspidata</i>	I	4
<i>Betula pendula</i> (seed/sap)	I	1-4
<i>Molinia caerulea</i>	I	1-4

Species list	Frequency	Abundance
<i>Rumex acetosella</i>	I	1-4
<i>Polytrichum juniperum</i>	I	3
<i>Carex pilulifera</i>	I	1-3
<i>Galium saxatile</i>	I	1-2
<i>Hypochaeris radicata</i>	I	1-2
<i>Aira praecox</i>	I	1
<i>Cerastium fontanum</i>	I	1
<i>Quercus robur</i> (seed/sap)	I	1
<i>Sorbus aucuparia</i>	I	1

- 7.1.4.3 The dry heathland community is extensive to the south-east and south-west of the junction and there is a heath glade within woodland to north-west of the junction. The constant species are heather (*Calluna vulgaris*), bell heather (*Erica cineria*) and wavy hair-grass (*Deschampsia flexuosa*), with occasional dwarf gorse (*Ulex minor*). Purple moor grass (*Molinia caerulea*) and pill sedge (*Carex pilulifera*) are occasional. Herbs are sparse and include heath bedstraw (*Galium saxatile*), tormentil (*Potentilla erecta*) and sheep's sorrel (*Rumex acetosella*).
- 7.1.4.4 Mosses are also a prominent component of the field layer including *Hypnum jutlandicum*, *Pseudoscleropodium purum*, *Polytrichum juniperum*, *Dicranum scoparium* and *Campylopus introflexus*. Small saplings invading from the neighbouring woodland are infrequent and include Scots pine (*Pinus sylvestris*), silver birch (*Betula pendula*), pedunculate oak (*Quercus robur*) and sweet chestnut (*Castanea sativa*). Areas of the heathland are also being overtaken by bracken (*Pteridium aquilinum*), which is frequently recorded.
- 7.1.4.5 In the areas of recently cleared woodland to restore heathland habitats a more impoverished community is seen with 60-80% bare ground colonised by mosses, in particular *Campylopus introflexus*. Heather is more common than bell heather in these areas and cover values are low. These recently cleared areas are recorded within the western section of Ockham Common, south-east of the junction, and within Wisley Common, south-west of the junction.
- 7.1.4.6 The dominant dry heath community is H2a *Calluna vulgaris*-*Ulex minor* heath, typical sub-community. MATCH coefficients for this community range from 46 to 55, where MATCH analysis was carried out for each separate location sampled.
- 7.1.4.7 Where there is impeded drainage on Wisley Common to the south-west of the junction, purple moor grass and cross-leaved heath (*Erica tetralix*) are present, and the abundance of heather and wavy hair-grass is reduced. This represents a transition to H2c *Calluna vulgaris*-*Ulex minor* heath, *Molinia caerulea* sub-community (frequently referred to as moist heath) sub-community.

#### Wet heath

- 7.1.4.8 Wet heath is present at suitable locations where the ground is low-lying and waterlogged. One location was sampled close to the pond east of Pond Farm, south-west of the junction. A total of five quadrat samples were taken. A summary floristic table is provided in Table 7.1.5 below.

**Table 7.1.5: NVC summary floristic table for wet heath**

Species list	Frequency	Abundance
<i>Molinia caerulea</i>	V	4-8
<i>Calluna vulgaris</i>	V	4-7
<i>Erica tetralix</i>	V	3-6
<i>Betula species (sap)</i>	V	3-4
<i>Luzula multiflora</i>	IV	1-2
<i>Pinus sylvestris</i>	IV	1-2
<i>Hypnum jutlandicum</i>	III	4-9
<i>Campylopus introflexus</i>	III	4-5
<i>Agrostis canina</i>	III	2-5
<i>Potentilla erecta</i>	III	1-4
<i>Pteridium aquilinum</i>	III	3
<i>Sphagnum cuspidatum</i>	II	1-5
<i>Carex panicea</i>	II	3-4
<i>Holcus lanatus</i>	II	2-4
<i>Polytrichum juniperum</i>	II	1-4
<i>Quercus robur</i>	II	1-3
<i>Juncus acutiflorus</i>	I	6
<i>Dicranum scoparium</i>	I	4
<i>Juncus conglomeratus</i>	I	4
<i>Pseudoscleropodium purum</i>	I	4
<i>Salix cinerea</i>	I	2
<i>Sphagnum compactum</i>	I	2
<i>Castanea sativa</i>	I	1
<i>Juncus squarrosus</i>	I	1
<i>Ulex europaea</i>	I	1

- 7.1.4.9 This community is defined by constant heather and cross-leaved heath and purple moor-grass. Bell heather is absent. Other species recorded included tormentil, heath wood-rush (*Luzula multiflora*), carnation sedge (*Carex panicea*), heath rush (*Juncus squarrosus*) and sharp flowered rush (*Juncus acutiflorus*). The moss *Sphagnum compactum* is present as small, patchy cushions and associated with other mosses, including *Hypnum jutlandicum*, *Sphagnum cuspidatum*, *Pseudoscleropodium purum*, *Polytrichum juniperum* and *Dicranum scoparium*.
- 7.1.4.10 The wet heath community is M16a *Erica tetralix*-*Sphagnum compactum* wet heath, typical sub-community, with a MATCH coefficients of 49. The wet heath community exists where suitably wet soil conditions allow, and there is a zonal transition from dry heath to wet heath with moist heath occupying a position between these communities that is intermediate in amount of waterlogging.

## Ponds

### *Shallow pools on peaty soils*

- 7.1.4.11 Ponds, lakes and ditches are present at various locations within and adjacent to the Scheme. Bolder Mere (W9 as shown on Figure 7.4), located east of the A3, south of the junction is a large lake with reedbed habitat, willow carr and wet woodland around its margins. There are two ponds (W27 and W28 as shown on Figure 7.4) within Wisley Common, south-west of the junction. These are situated within the heathland. All of these waterbodies are situated over acidic, peaty substrates, and feature mire communities at their margins
- 7.1.4.12 Two quadrat samples were taken from one location close to pond W28 (see Figure 7.4) within Wisley Common, south-west of the junction that is adjacent to Pond Farm. A summary floristic table is provided in Table 7.1.6 below.

**Table 7.1.6: NVC summary floristic table for shallow pools on peaty soils**

Species list	Frequency	Abundance
<i>Eleogiton fluitans</i>	II	8
<i>Juncus bulbosus</i>	II	7-8
<i>Sphagnum cuspidatum</i>	II	5-8
<i>Juncus effusus</i>	II	4-8
<i>Hydrocotyle vulgaris</i>	II	5-6
<i>Molinia caerulea</i>	II	4-5
<i>Eriophorum angustifolium</i>	I	4
<i>Agrostis canina</i>	I	4
<i>Ranunculus flammula</i>	I	2
<i>Betula species (seed)</i>	I	1
<i>Calluna vulgaris</i>	I	1
<i>Polygonum persicaria</i>	I	1
<i>Quercus robur (sap)</i>	I	1

- 7.1.4.13 This community has constant marsh St John's-wort (*Hypericum elodes*) and marsh pennywort (*Hydrocotyle vulgaris*), floating club rush (*Eleogiton fluitans*) with velvet bent and purple moor grass. Bulbous rush (*Juncus bulbosus*) and soft rush (*Juncus effusus*) are also frequent with occasional common cottongrass (*Eriophorum angustifolium*), lesser spearwort (*Ranunculus flammula*), marsh bedstraw and common spike-rush (*Eleocharis palustris*).
- 7.1.4.14 *Sphagnum cuspidatum* is the most common moss within the pools. Around the edges of the pools on the south and eastern margins of Bolder Mere there are occasional tall marginal plants including water plantain (*Alisma plantago-aquatica*), bulrush (*Typha latifolia*), yellow iris (*Iris pseudacorus*) and common reed (*Phragmites australis*).

- 7.1.4.15 This community resembles M29 *Hypericum elodes*-*Potamogeton polygonifolius* soakaway due to the presence of marsh St-John's-wort associated with *Sphagnum* mosses. There are no sub-communities for this community. The MATCH coefficient is relatively low at 38. In the two ponds within Wisley Common (W27 and W28), south-west of the junction, marsh St-John's-wort was absent and bog pondweed (*Potamogeton polygonifolius*) was absent from both Bolder Mere (W9) and ponds W27 and W28 within Wisley Common, south-west of the junction.

#### Secondary woodland, wood pasture and parkland

##### *Oak/birch/pine woodland on acidic soil*

- 7.1.4.16 The most abundant habitat within the Scheme, and immediately adjacent to it is defined as secondary woodland, with areas of wood pasture/parkland. This is often mixed secondary woodland forming a closed canopy of Scots pine, silver birch, or pedunculate oak, and transitions quite abruptly to open heath. Some areas have been recently cleared of trees and are regenerating to open heath.
- 7.1.4.17 On the very acidic sandy oligotrophic soils the woodland community is formed of a canopy of silver birch, Scots pine and pedunculate oak with abundant bracken and occasional wavy hair grass characteristic of the ground flora. Fourteen samples were taken across three locations close to the A3 and M25 to the north-east, south-east and south-west of the junction. A summary floristic table is provided in Table 7.1.7 below.

**Table 7.1.7: NVC summary floristic table for oak/birch woodland on acidic soil**

Species list	Frequency	Abundance
<i>Pteridium aquilinum</i>	V	3-10
<i>Pinus sylvestris</i>	V	2-9
<i>Betula pendula</i>	V	1-9
<i>Rubus fruticosus</i> agg.	IV	1-8
<i>Quercus robur</i>	III	1-8
<i>Lonicera periclymenum</i>	III	1-6
<i>Castanea sativa</i>	III	1-5
<i>Deschampsia flexuosa</i>	III	1-5
<i>Molinia caerulea</i>	II	2-10
<i>Kinbergia praelongum</i>	II	2-4
<i>Pseudoscleropodium purum</i>	II	2-4
<i>Teucrium scorodonia</i>	II	1-4
<i>Acer pseudoplatanus</i>	II	1-3
<i>Sorbus aucuparia</i>	II	1-3
<i>Glechoma hederacea</i>	I	4-5
<i>Erica cinerea</i>	I	3-4
<i>Poa trivialis</i>	I	2-4



Species list	Frequency	Abundance
<i>Acaena novae-zelandiae</i>	I	2-3
<i>Poa nemoralis</i>	I	2-3
<i>Circaea lutetiana</i>	I	5
<i>Geranium robertianum</i>	I	3
<i>Holcus lanatus</i>	I	3
<i>Hypnum jutlandicum</i>	I	3
<i>Polytricum formosum</i>	I	3
<i>Quercus cerris</i>	I	3
<i>Thuidium tamariscum</i>	I	3
<i>Betula pubescens</i>	I	1-3
<i>Dicranum scoparium</i>	I	1-3
<i>Fagus sylvatica</i>	I	1-3
<i>Galium saxatile</i>	I	2
<i>Hedera helix</i>	I	2
<i>Ilex aquifolium</i>	I	2
<i>Mnium hornum</i>	I	2
<i>Ulex europaea</i>	I	2
<i>Agrostis canina</i>	I	1-2
<i>Carex pilulifera</i>	I	1-2
<i>Prunella vulgaris</i>	I	1-2
<i>Brachypodium sylvaticum</i>	I	1
<i>Carpinus betulus</i>	I	1
<i>Dryopteris dilatata</i>	I	1
<i>Geum urbanum</i>	I	1
<i>Juncus effusus</i>	I	1
<i>Rubus idaeus</i>	I	1
<i>Stellaria media</i>	I	1

7.1.4.18 In this woodland community Scots pine is often dominant within the high canopy with silver birch as a secondary species. Rowan (*Sorbus aucuparia*), sweet chestnut and pedunculate oak are occasional, the latter two species gaining dominance in small stands. Bracken and bramble (*Rubus fruticosus* agg.) are prominent in the understorey and wavy hair grass and purple moor grass are also present but patchy.

7.1.4.19 In the more open patches of this woodland community and on the larger woodland rides heather and bell heather are present with common bent grass (*Agrostis capillaris*), heath grass (*Danthonia decumbens*), and occasional tormentil, heath bedstraw and sheep's sorrel.

7.1.4.20 Ground flora species characteristic of ancient woodland are scarce in this community but broad-leaved helleborine (*Epipactis helleborine*), wood sorrel (*Oxalis acetosella*), bluebell (*Hyacinthoides non-scripta*) and lesser skullcap (*Scutellaria minor*) were recorded.

7.1.4.21 This woodland community is W16a *Quercus* spp.-*Betula* spp.-*Deschampsia flexuosa* woodland, *Quercus robur* sub-community. MATCH coefficients for this community range from 45 to 49.

*Acid grassland/dry heath mosaic in woodland rides*

7.1.4.22 On the wide sandy woodland rides of the W16a woodland plant community there is a diverse ground flora on the rides where the canopy is more open. A diverse assemblage of acid indicators and woodland ground flora species were recorded in these areas including the grasses wavy hair grass and purple moor grass with the herbs tormentil, sheep's sorrel, heather, bell heather, heath speedwell (*Veronica officinalis*), vervain (*Verbenaca officinalis*), heath wood rush, barren strawberry (*Potentilla sterilis*) and wood sage (*Teucrium scorodonia*). There were areas with more impeded drainage in which marsh bedstraw (*Galium palustre*) and water purslane (*Lythrum portula*) were recorded.

*Birch Woodland on Damp Acidic Soil*

7.1.4.23 Around the eastern and southern margins of Bolder Mere a wet woodland community dominated by downy birch (*Betula pubescens*) co-dominant with silver birch, occasional alder (*Alnus glutinosa*), grey willow (*Salix cineria*) and goat willow (*Salix caprea*), with a high canopy of occasional Scots pine. The understorey is a luxuriant carpet of purple moor grass particularly in more open patches associated with sphagnum mosses. Floating club rush (*Eleogiton fluitans*), marsh St John's-wort (*Hypericum elodes*) and marsh pennywort (*Hydrocotyle vulgaris*) are present with velvet bent (*Agrostis canina*) forming luxuriant carpets around the edge.

7.1.4.24 This community is predominately W4c *Betula pubescens*-*Molinea caerulea* woodland, *Sphagnum* spp. sub-community typical of wet acidic soils over peat (based on surveyor experience). There is commonly a mosaic of W16 and W4 woodland types on acidic soils depending on the level of impeded drainage.

Lowland mixed deciduous woodland

*Oak woodland on acidic to neutral soil*

7.1.4.25 The typical secondary woodlands within the survey area on the fringes of the heathland are dominated by pedunculate oak with silver birch frequent, and bracken and bramble prominent in the ground flora. This woodland type is on less acidic soils, than the oak/birch/pine woodland described above, but there is much overlap between the two woodland communities where there is a transition. Establish oak woodland is dominant to the north-west and north-east of the junction.

7.1.4.26 Three samples were taken at Redhill Bottom and Chatley Wood to the north-east of the junction. A summary floristic table is provided in Table 7.1.8 below.

**Table 7.1.8: NVC summary floristic table for oak woodland on acidic to neutral soil**

Species list	Frequency	Abundance
<i>Betula pendula</i>	III	5-7
<i>Pinus sylvestris</i>	III	1-7
<i>Quercus robur</i>	III	2-4
<i>Pteridium aquilinum</i>	III	1-4
<i>Sorbus aucuparia</i>	III	1
<i>Agrostis capillaris</i>	II	4-6
<i>Teucrium scorodonia</i>	II	4-5
<i>Acer pseudoplatanus</i>	II	1-5
<i>Lonicera periclymenum</i>	II	3-4
<i>Rubus fruticosus</i> .agg.	II	1-4
<i>Castanea sativa</i>	II	1-2
<i>Mnium hornum</i>	I	7
<i>Poa trivialis</i>	I	7
<i>Polytrichum juniperum</i>	I	7
<i>Scutellaria minor</i>	I	7
<i>Aira praecox</i>	I	4
<i>Ajuga reptans</i>	I	4
<i>Atrichum undulatum</i>	I	4
<i>Kindbergia praelongum</i>	I	4
<i>Quercus cerris</i>	I	4
<i>Circea lutetiana</i>	I	3
<i>Crataegus monogyna</i>	I	1
<i>Dryopteris dilitata</i>	I	1
<i>Epilobium ciliatum</i>	I	1
<i>Ilex aquifolium</i>	I	1
<i>Molinia caerulea</i>	I	1
<i>Rhododendron ponticum</i>	I	1
<i>Scrophularia nodosa</i>	I	1
<i>Senecio jacobaea</i>	I	1
<i>Viola species</i>	I	1

7.1.4.27 The most common canopy species of this community are pedunculate oak and silver birch. Frequently prominent in the canopy are sweet chestnut, Turkey oak (*Quercus cerris*) and Scots pine.

- 7.1.4.28 The understorey is sparse and species-poor due to the heavy shading of the even-aged canopy. Bramble, bracken and honeysuckle (*Lonicera periclymenum*) are abundant and in more open areas bracken is invasive. There are few species characteristic of ancient woodland and more species-diverse oak woodland communities, and bluebell is noticeably absent. Mosses *Mnium hornum* and *Atrichum undulatum* are present with occasional wood sage (*Teucrium scorodonia*).
- 7.1.4.29 This woodland community is W10d *Quercus robur*-*Pteridium aquilinum*-*Rubus fruticosus* woodland, *Holcus lanatus* sub-community. The MATCH coefficient for this community sampled in Chatley Wood to the north-east of the junction is 42.

#### Ancient woodlands

##### *Heyswood*

- 7.1.4.30 The Woodland at Heyswood Girl Guide Camp is located adjacent to the A3 southbound carriageway, north of the junction. The woodland falls partially within the Scheme, but the majority is outside the Scheme. This is ancient woodland listed on the national ancient woodland inventory<sup>4</sup>.
- 7.1.4.31 This woodland is split into two compartments, with a gas compound between. There are trees within the compound that give some continuity of the woodland canopy, but substantial gaps are present. Woodland ground flora in the compound area is sparse, due to disturbance or regular management of the compound area.
- 7.1.4.32 The south-western compartment (1.6 ha in area) is within the girl guide camp, and the driveway to the camp marks the south-eastern boundary, although large mature trees are present on the opposite side of the driveway to the woodland. The woodland has a canopy of primarily deciduous trees, including several mature specimens of sweet chestnut, beech (*Fagus sylvatica*), pedunculate oak, turkey oak, red oak (*Quercus rubra*), hornbeam (*Carpinus betulus*) and silver birch. There are several pedunculate oaks that appear to be c200 years in age. Mature common lime (*Tilia x europaea*) and horse chestnut (*Aesculus hippocastanum*) are present along the driveway. The understorey includes a dense distribution of sycamore (*Acer pseudoplatanus*) saplings, with patches of cherry laurel (*Prunus laurocerasus*), holly (*Ilex aquifolium*) and rhododendron (*Rhododendron ponticum*).
- 7.1.4.33 The ground flora is sparse due to shading by the mature trees. Bramble, bracken and bluebell are scattered throughout, and there are patches of common nettle (*Urtica dioica*), ground ivy (*Glechoma hederacea*), enchanter's nightshade (*Circaea lutetiana*) and foxglove (*Digitalis purpurea*). Ferns are occasional, including broad buckler-fern (*Dryopteris dilatata*) and male fern (*Dryopteris filix-mas*). Herb-Robert (*Geranium robertianum*), red campion (*Silene dioica*) and cleavers (*Galium aparine*) are also occasional. Mosses are prominent in certain places, with *Polytricum formosum*, *Mnium hornum* and *Kingbergia praelonga* common.
- 7.1.4.34 This woodland community is W10a *Quercus robur*-*Pteridium aquilinum*-*Rubus fruticosus* woodland, typical sub-community.

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<sup>4</sup> Identified using the MAGIC website (<https://magic.defra.gov.uk>).

7.1.4.35 The northern compartment (0.4 ha in area) of this woodland is in private ownership and situated on the boundary of pasture and is grazed under by horses and cattle. This section of woodland has frequent hornbeam and sycamore, with occasional sweet chestnut and silver birch. There is no shrub layer to the woodland and the ground flora has a prominent grass component, with Yorkshire-fog (*Holcus lanatus*), rough meadow-grass (*Poa trivialis*), and creeping soft-grass (*Holcus mollis*) common. Also frequently occurring throughout the woodland are bluebell, ground ivy, common nettle and bracken. Foxglove and the ancient woodland indicator species hairy wood-rush (*Luzula pilosa*), three-nerved sandwort (*Moeringia trinervia*), and pignut (*Conopodium majus*) were occasionally recorded.

7.1.4.36 This community is W10d *Quercus robur*-*Pteridium aquilinum*-*Rubus fruticosus* woodland, *Holcus lanatus* sub-community.

#### *Elm Corner Wood*

7.1.4.37 Elm Corner Wood is a 1.4 ha ancient woodland located alongside the A3 southbound carriageway south of the junction. It is at the south extreme of Ockham Common, situated close to the Elm Corner settlement, and at the western edge of the former Wisley aerodrome. This woodland falls partially within the Scheme, although the majority of the woodland is outside of the Scheme. This woodland compartment is listed on the ancient woodland inventory and is separated from Ockham Common by a prominent ditch.

7.1.4.38 The woodland has a dominant shrub layer, composed of hazel (*Corylus avellana*), holly, elder (*Sambucus nigra*) and hawthorn (*Crataegus monogyna*), and relatively open high canopy of pedunculate oak and ash (*Fraxinus excelsior*). Silver birch and sycamore were occasionally recorded in the canopy.

7.1.4.39 The ground flora is heavily shaded in places but relatively diverse close to the boundary with Wisley Airfield. Here there is moschatel (*Adoxa moschatellina*), germander speedwell (*Veronica chamaedrys*), broad buckler-fern, bramble, rough meadow-grass, ground ivy and common nettle, all common. Bluebell is locally abundant but was not found throughout the woodland. Male fern is frequent, and lady fern (*Athyrium filix-femina*) occasional, along with lords-and-ladies (*Arum maculatum*), red campion and enchanter's nightshade. Remote sedge (*Carex remota*), wood speedwell (*Veronica montana*), creeping buttercup (*Ranunculus repens*), wood avens (*Geum urbanum*), marsh thistle (*Cirsium palustre*), lesser burdock (*Arctium minus*) and garlic mustard (*Alliaria petiolata*) are present but rare within the woodland.

7.1.4.40 Five samples were taken at within Elm Corner Wood. A summary floristic table is provided in Table 7.1.9 below. Canopy species are at the top, above the blue line, with ground flora below. Frequency is not given for canopy species as a single sample was taken.



**Table 7.1.9: NVC summary floristic table for Elm Corner Wood**

Species list	Frequency	Abundance
<i>Quercus robur</i>		7
<i>Corylus avellana</i>		5
<i>Fraxinus excelsior</i>		4
<i>Ilex aquifolium</i>		4
<i>Sambucus nigra</i>		4
<i>Acer pseudoplatanus</i>		3
<i>Betula pendula</i>		2
<i>Crataegus monogyna</i>		2
<i>Frangulus alnus</i>		1
<i>Taxus baccata</i>		1
<i>Urtica dioica</i>	V	4-9
<i>Galium aparine</i>	V	1-6
<i>Poa trivialis</i>	V	1-4
<i>Fraxinus excelsior</i> (seed)	V	2-3
<i>Glechoma hederacea</i>	III	6-9
<i>Hyacinthoides non-scripta</i>	III	1-6
<i>Adoxa moschatellina</i>	III	4-5
<i>Sambucus nigra</i> (sap)	III	2
<i>Dryopteris dilatata</i>	III	1-2
<i>Pteridium aquilinum</i>	III	1-2
<i>Acer pseudoplatanus</i> (seed)	II	1-2
<i>Dryopteris filix-mas</i>	II	1-2
<i>Moeringia trinervia</i>	II	1-2
<i>Rubus fruticosus</i> .agg.	II	1-2
<i>Arum maculatum</i>	II	1
<i>Kindbergia praelonga</i>	I	3
<i>Mnium hornum</i>	I	3
<i>Arctium minus</i>	I	2
<i>Athyrium filix-femina</i>	I	2
<i>Callitriche stagnalis</i>	I	2
<i>Scutellaria nodosa</i>	I	2
<i>Veronica chamaedrys</i>	I	2
<i>Circea lutetiana</i>	I	1
<i>Crataegus monogyna</i> (seed)	I	1
<i>Hedera helix</i>	I	1

Species list	Frequency	Abundance
<i>Ilex aquifolium</i> (sap)	I	1
<i>Myosotis arvensis</i>	I	1
<i>Silene dioica</i>	I	1

7.1.4.41 Elm Corner Wood is W10a *Quercus robur*-*Pteridium aquilinum*-*Rubus fruticosus* woodland, typical sub-community. The MATCH coefficient is 39.

#### Hatchford Wood

7.1.4.42 Hatchford Wood is a 15 ha ancient woodland situated to the south of the M25 east of the junction. It is on the eastern boundary of Ockham Common, and outside of the Scheme but adjacent to it. The woodland is on a slope with a south-eastern aspect. The northern end of the woodland slopes down to the M25, which is situated in a cutting at this location. Hatchford Wood is listed on the ancient woodland inventory.

7.1.4.43 The woodland has an open canopy of silver birch and pedunculate oak, with sweet chestnut and Scots pine frequently found. Sycamore is abundant in the north of the woodland adjacent to the M25, and aspen (*Populus tremula*) and grey willow (*Salix cinerea*) are locally abundant. Some old planted specimen trees and shrubs are present, including wellingtonia (*Sequoiadendron giganteum*), coast redwood (*Sequoia sempervirens*), holm oak (*Quercus ilex*) and yellow azalea (*Rhododendron luteum*).

7.1.4.44 There are relatively few shrub species and the shrub layer is relatively open. This is partly due to recent removal of mature rhododendron which may have dominated parts of the woodland in the past. Where there are gaps created, sapling birch and bracken are abundant and locally dominant.

7.1.4.45 Bramble is abundant throughout the woodland, forming a dense but low tangle. Herb species are occasional or rare in the ground flora. Occasional species include broad buckler-fern, wood sage, heath speedwell, common dog-violet (*Viola riviniana*), sheep's sorrel, broad-leaved willowherb (*Epilobium montanum*) and rough meadow-grass. Remote sedge, pendulous sedge (*Carex pendula*), wood sedge (*Carex sylvatica*), male fern, germander speedwell, figwort, lords-and-ladies and ground ivy are rare. Enchanter's nightshade and herb robert are locally frequent.

7.1.4.46 Five samples were taken within Hatchford Wood. A summary floristic table is provided in Table 7.1.10 below. Canopy species are at the top, above the blue line, with ground flora below. Frequency is not given for canopy species as a single sample was taken.

**Table 7.1.10: NVC summary floristic table for Hatchford Wood**

Species list	Frequency	Abundance
<i>Betula pendula</i>		8
<i>Quercus robur</i>		7
<i>Castanea sativa</i>		5
<i>Pinus sylvestris</i>		5

Species list	Frequency	Abundance
<i>Acer pseudoplatanus</i>		4
<i>Populus tremula</i>		2
<i>Crataegus monogyna</i>		1
<i>Fagus sylvatica</i>		1
<i>Salix cinerea</i>		1
<i>Rubus fruticosus.agg</i>	V	2-9
<i>Rhododendron ponticum</i>	IV	1-2
<i>Polytrichum formosum</i>	III	3-7
<i>Pteridium aquilinum</i>	III	2-7
<i>Hypnum cupressiforme</i>	III	3
<i>Kindbergia praelonga</i>	II	2-3
<i>Teucrium scordium</i>	II	1-2
<i>Veronica officinalis</i>	II	1
<i>Carex pendula</i>	I	2
<i>Circea lutetiana</i>	I	2
<i>Dryopteris dilitata</i>	I	2
<i>Populus tremula (sucker)</i>	I	2
<i>Rumex acetosella</i>	I	2
<i>Alliaria petiolate</i>	I	1
<i>Betula pendula (sapling)</i>	I	1
<i>Carex sylvatica</i>	I	1
<i>Epilobium species</i>	I	1
<i>Fraxinus excelsior (seedling)</i>	I	1
<i>Gaultheria shallon</i>	I	1
<i>Geranium robertianum</i>	I	1
<i>Hypericum androsaemum</i>	I	1
<i>Juncus effusus</i>	I	1
<i>Lapsana communis</i>	I	1
<i>Poa trivialis</i>	I	1
<i>Rumex obtusifolius</i>	I	1
<i>Scrophularia nodosa</i>	I	1
<i>Solanum dulcamara</i>	I	1
<i>Sorbus aucuparia (seedling)</i>	I	1
<i>Urtica dioica</i>	I	1

7.1.4.47 Hatchford Wood is W10a *Quercus robur*-*Pteridium aquilinum*-*Rubus fruticosus* woodland, typical sub-community. The MATCH coefficient is 29.

## Notable plants

- 7.1.4.48 The notable plant species bog hair grass (*Dechampsia setacea*) and lesser water plantain (*Baldellia ranunculoides*) and multi-stemmed spike-rush (*Eleocharis multicaulis*) were not found during the survey although records of these plants are known for Wisley and Ockham Commons SSSI.
- 7.1.4.49 Royal fern (*Osmundia regalis*) was recorded during the survey outside of the Scheme to the north of a pond (W27 known as Teal Pond) in Wisley Common south-west of the junction. The plant was situated at two locations on a wet ditch within a wet woodland area (Grid reference TQ 06870 58956, TQ 06926 58920).
- 7.1.4.50 Cross-leaved heath was recorded at numerous locations in the wet heath communities within Wisley Common south-west of the junction, particularly to the east of Pond Farm (grid ref: TQ 075 589).

## 7.1.5 Discussion

- 7.1.5.1 The notable habitats surveyed are within Wisley and Ockham Common SSSI, except for the ancient woodlands at Heyswood, Hatchwood and Elm Corner which are outside of the SSSI and SPA. Secondary woodland sampled to the north of the M25 is within the SSSI but outside the SPA boundary. Evaluation of habitats is provided in the main ES chapter, but some notes on management and other context are provided below.
- 7.1.5.2 Lowland heathland is a threatened habitat with Surrey having lost 85% of heathland over the last 200 years. The heathlands to the south-east and south-west of the junction and a glade to the north-east of the junction represent good examples of dry heath and wet heath in different stages of succession.
- 7.1.5.3 The secondary woodlands within the SSSI are not listed on the national ancient woodland inventory. This woodland habitat is formed from growth (or possible planting) of pine, oak and birch on former heathland and more established stands are over 100 years old (and are showing present on the Ordnance Survey from the late 1800s). Scattered ground flora including a small number of species indicative of ancient woodland is present, particularly in to the north-west of the junction, including broad-leaved helleborine, lesser skullcap and bluebell. However, it appears these areas have been correctly excluded from the ancient woodland inventory.
- 7.1.5.4 Where secondary pine woodland dominates, it creates a heavy shade which does not allow for a diversity of ground flora, or for other trees and shrubs to germinate and grow enough to provide a diversity of species and structure.
- 7.1.5.5 Rhododendron clearance has been undertaken recently within Hatchford Wood to restore the understorey and shrub layer.
- 7.1.5.6 There appears to be little management of the southern section of Heyswood, within the Girl Guide camp. The woodland appears to have been managed in Victorian times but has not been subject to recent management. The northern section of this woodland is currently grazed under by horses and cattle.

- 7.1.5.7 Elm Corner Wood appears to have had little management in recent years, and has been used by unauthorised motorcyclists, although Surrey Wildlife Trust have taken steps to prevent this. There is a ditch at the northern boundary of the woodland compartment that marks the historical boundary of the common land. This indicates that Elm Corner Wood will have historically been protected from livestock and therefore managed for woodland products and may also have been privately owned.
- 7.1.5.8 Hatchford Wood is mixed woodland at the eastern edge of Ockham Common and likely to have been outside of the historical common land and grazing stock excluded. This woodland could possibly have been under the ownership of Hatchford Park, immediately to the east.



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