Havant Thicket Reservoir Project

Environmental Statement Volume 4 - Appendices

Appendix A9 Biodiversity

A9.2 Vegetation Survey Report

Portsmouth Water Ltd.

ECOSA
Ecological Survey & Assessment
A Trinity Consultants Company

HAVANT THICKET WINTER STORAGE RESERVOIR, ROWLAND'S CASTLE, HAMPSHIRE

APPENDIX 9.2
VEGETATION SURVEY REPORT

Final Document (Revision 2)

January 2020

Preliminary Ecological Appraisals • Protected Species Surveys and Licensing • NVC • EcIA • HRA • Management Plans
Habitats • Badger • Bats • Hazel Dormouse • Birds • Reptiles • Amphibians • Invertebrates • Riparian and Aquatic Species

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ECOSA Quality Assurance Record

This report has been produced in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Report Writing 2017 (CIEEM, 2017). Survey work has been undertaken in line with references within CIEEM's Source of Survey Guidance (CIEEM, 2017).

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* ECOSA produced this report as a stand-alone Ecological Impact Assessment. The document was converted into an Appendix to an Environmental Statement by Atkins, with approval of ECOSA, in August 2020. This has included removal of impact assessment and mitigation text which is covered in Chapter 9 (Biodiversity) of the ES.

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HAVANT THICKET WINTER STORAGE RESERVOIR, ROWLAND'S CASTLE, HAMPSHIRE

VEGETATION SURVEY REPORT

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1.0 INTRODUCTION

1.1 Background

Ecological Survey & Assessment Limited (ECOSA) have been appointed by Portsmouth Water Limited (Portsmouth Water) to undertake a vegetation survey and report of their land at Havant Thicket, Rowland's Castle, Hampshire. The site is centred on National Grid Reference (NGR): SU 715 097 (**Map C1**).

The vegetation report is required as a result of Portsmouth Water's plan to construct a winter storage reservoir, Havant Thicket Winter Storage Reservoir (HTWSR), for public water supply in the centre of the site. At the time of survey, the final designs were not confirmed, although the extent of the development was proposed to be approximately 1.6 kilometres from east to west and 800 metres from north to south with a storage capacity of approximately 8,700 million litres. It was understood water would be pumped into the reservoir from Portsmouth Water sources at Havant and Bedhampton Springs, providing a sustainable supply of water with no requirement to change the existing abstraction licence.

At the time the surveys were undertaken the planning application red line boundary (see **Figure 2.1 in Volume 3**) had not been defined and therefore the Site Boundary (the site) and Ecological Enhancement Area (wider site) boundaries referred to in this report were provisional boundaries available at that time. Within this report where mention is made of 'the site' this refers to the reservoir footprint and other areas used for built development and habitat creation. This area is referred to as the 'Reservoir Footprint' in the Environmental Statement (as the Site includes the reservoir footprint, the pipeline corridor as well as land around the reservoir footprint being used for ecological mitigation and compensation). Where reference is made in this report to the 'wider site' this includes the reservoir and the area proposed for ecological enhancement within Forestry England's (FE) Havant Thicket woodland to the north and Bell's Copse to the west of the site and Staunton Country Park (SCP) to the south of the site. This area is similar to the area referred to as the 'Reservoir Site' in the Environmental Statement. The areas covered by 'the site' and 'wider site' in this report are shown in **Map C1** and the key ecological and landscape features mentioned in this report are shown in **Map C2**.

1.2 The Site

The site is situated within a mixed urban and suburban setting with dense residential development to the south and south-west (Leigh Park and Warren Park). The A3(M) road runs parallel (north/south) to the site approximately 500 metres to its west. To the north, woodland (Havant Thicket) and pasture extend northwards with a mix of arable, pasture and woodland located to the north-east. To the east of the site lies a low-density

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residential area known as Rowland's Castle, beyond which lie Stansted Park Estate and Southleigh Forest located just within the Sussex county boundary.

At the time of survey the proposed reservoir site covers an area of approximately 160 hectares, with a reservoir footprint area of approximately 140 hectares. The land within the site comprises predominantly open pasture, small woodland blocks, tree lines, hedgerows and ditches and includes a central spur of woodland referred to as The Avenue. Forestry England own Havant Thicket, located to the north of the reservoir, this area consists of approximately 99 hectares of predominately pine *Pinus* species woodland. Part of Staunton Country Park is located to the south of the site, comprising parkland and woodland covering approximately 63 hectares.

1.3 Aims and Scope of Report

The information within this report is based on a desktop study and vegetation survey carried out by ECOSA between 2006 and 2009 and May, June and July 2018. The report provides a detailed summary of the ecological survey work undertaken.

The 2018 survey was to review the habitats previously mapped in 2009 and note any significant changes, providing updated maps as appropriate.

Detailed surveys of the wider-site woodlands within Havant Thicket woodland or SCP were not undertaken in 2018, however the detailed data collected in 2006 to 2009 can be obtained on request. Representative areas of the Forestry England woodland adjacent to the northern site boundary were surveyed to establish if the habitats had changed since 2009. This information can be used to assess how other similar woodland compartments may have changed.

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2.0 METHODS

2.1 Introduction

This section details the methods employed during the vegetation surveys undertaken for the HTWSR site during 2018. Any significant limitations to the survey methods are also discussed. This section also includes methods for desktop study data collation from relevant vegetation surveys undertaken within the site by ECOSA between 2006 and 2009.

2.2 Zone of Influence

To define the total extent of the study area for this appraisal (Zone of Influence[1]), the proposed scheme was reviewed to establish the spatial scale at which the vegetation could be affected. The appropriate survey radii for the various elements of the appraisal (i.e. desktop study and vegetation survey) have been defined in the relevant sections below. These distances are determined based on the professional judgement of the ecologist leading the appraisal, taking into account the characteristics of the site subject to appraisal, its surroundings and the nature and scope of the development proposals and the ecology of the species of focus within this report.

2.3 Desktop Study

2.3.1 Biological Records Centre

Hampshire Biodiversity Information Centre (HBIC) was consulted on 30th April 2018[2] for the following data:

- Records of non-statutory designated sites (Local Wildlife Sites (LWSs), Sites of Importance for Nature Conservation (SINCs), Site of Nature Conservation Interest (SNCIs) etc.) within two kilometres of the site boundary; and

- Records of legally protected and notable flora species within one kilometre of the site boundary, including Habitats of Principal Importance ('Priority Habitats') for the Conservation of diversity in England notified under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 and as listed in the England Biodiversity List.

2.3.2 Multi-Agency Geographic Information for the Countryside

The Multi-Agency Geographic Information for the Countryside (MAGIC)[3] database was reviewed on 10th February 2019 to establish the location of statutory designated sites located within the vicinity of the site which were either designated for notable habitats

[1] The Zone of Influence (ZoI), as defined by CIEEM, is the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities.
[2] Due to the age of this data and updated desk study has been undertaken in 2020 and details are included in Appendix 9.1.
[3] www.defra.magic.gov.uk

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or include notable plant species within their citation for a reason for designation. This included a search for all internationally and nationally designated sites such as Special Areas of Conservation (SACs), Wetlands of International Importance (Ramsar sites), Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs) within two kilometres of the site.

2.3.3 Other Sources of Information

ECOSA undertook vegetation surveys at the site during 2006, 2008 and 2009 (ECOSA, 2013). The information from these surveys is included in the 2018 baseline to aid the assessment of the site on-site vegetation. This was considered appropriate given that plants are, in most circumstances, unable to colonise new areas quickly and therefore the previous survey data is still relevant to this assessment.

White Young and Green (WYG, 2014) undertook a grassland survey during 2014 in relation to an outline planning application for new homes at land east of Horndean (East Hampshire District Council planning reference: 55562/001). This area is located to the north-west of the site.

2.4 National Vegetation Classification Survey

2.4.1 Survey Methods

The areas surveyed in 2018 are shown on **Map C3,** together with target note reference codes (see below) and showing broad areas of vegetation (**Map C6**). The survey covered all of the grassland and woodland areas lying within the site, the proposed access track on the west side of Havant Thicket and the potential options for public car parks at the south-east corner of Blendworth Common[4], the northern end of Bell's Copse and the south-west corner of Havant Thicket. The surveyor noted any significant changes in vegetation compared to the 2009 survey findings. **Map C7** shows the updated vegetation types found at the site in greater detail. In addition, the existing public car park and surrounding area on the east side of Havant Thicket woodland were also revisited.

The site has been divided up into the main parcels of land, referred to here as 'target note areas' (**Map C6**). The target note reference codes have changed from those used in past surveys.

The main grassland, woodland, streams and tracks making up the majority of the site have been numbered clockwise around the site from the north-west corner (prefixed by the letters 'G', 'W', 'S' and 'T'). Areas of former heathland which are now mostly thickets

[4] These car park options were discounted as part of the design process by Atkins,

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of birch scrub are prefixed with 'H' to differentiate from the more mature plantation and semi-natural woodland.

Scientific and English plant names follow Stace's *New Flora of the British Isles*, Third Edition (Stace, 2010). The DAFOR codes are defined below:

- D = dominant (species contributing most to the woodland canopy or other vegetation layer either by biomass or cover);
- A = abundant (very numerous species or those with high cover);
- F = frequent (generally numerous);
- O = occasional (not numerous, scattered);
- R = rare (only one or a few individuals recorded over the survey area);
- LF and LA = locally frequent/locally abundant (frequent or abundant in scattered, usually small patches or areas);
- R/LF and R/LA = rare and locally frequent/abundant (frequent or abundant in one, or sometimes a few small patches).

The boundaries of vegetation types are marked onto printed aerial photographs and later mapped digitally using a GIS application.

Special attention was paid during the surveys to searching for indicator species, which for woodlands are referred to as Ancient Woodland Vascular Plants (AWVP) (Rose, 1999). These are very useful for assessing the nature conservation value of woodland areas (though not necessarily for determining whether a woodland is ancient or not). The standard list of 100 species was used for the surveys, originally developed by the former Nature Conservancy Council (NCC) in the 1980s to cover southern England and now adopted by conservation bodies in Hampshire, including HBIC.

AWVPs are those considered to be 'most strongly associated with ancient woodland and are typical components of botanically-rich ancient woodland communities.' AWVPs have been marked in a separate column in the woodland species lists. This information has been used to create a table summarising information on the four woodland blocks at the site, providing information on the history and AWVP species for each block (**Appendix C2**).

This report is presented as a summary using target notes for each main vegetation type. Information from previous surveys is also summarised where relevant and a comment made on any changes since the previous surveys. Updated species lists with DAFOR scores have been included for the four main woodland areas lying within the proposed site and for Blendworth Common. Short lists are included for some other important areas, including the small blocks of semi-natural broadleaved woodland along the southern edge of Havant Thicket associated with watercourses. Brief notes

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on National Vegetation Classification (NVC) types are given in each vegetation summary and a list of NVC types is given at the end of each target note description. Throughout the baseline (Section 3.0) the NVC references listed at the end of each target note area description are listed in approximate order of decreasing extent, with the habitat types covering the largest area first. A list of all the NVC types mentioned, with their full names, is given in **Appendix C1** – available on request.

Indicator species of unimproved acid grassland, and Acid to neutral grassland are also discussed (where relevant), these species are indicative of a long period of uninterrupted grassland management. Species strongly associated with unimproved lowland dry acid grassland comprises a list of 100 species based on English Nature Research Report 259: A review of the extent, conservation interest and management of lowland acid grassland in England (English Nature, 1998). Acid to neutral grassland indicators comprise 65 species used by HBIC to assess acid to neutral grassland (unpublished HBIC data).

Within the main body of the text detailed species lists for the woodlands present within the site are presented, detailed species lists for other habitats on-site and within the wider site are shown in the 2013 ECOSA Vegetation Report located in **Appendix C1** – available on request.

2.4.2 Survey Details

During 2018 the vegetation surveys were carried out on a number of dates between 9th May and 26th June. Previous surveys were undertaken in 2006, 2008 and 2009. An additional survey visit was carried out in July 2019 to map areas of species rich marsh and rush pasture along the watercourses. Details are provided in **Table C1**.

Table C1: Summary of Vegetation Surveys

Survey period	Areas surveyed
16th August - 8th September 2006	Whole of proposed reservoir area (all grassland and three main woodlands).
18th October 2008	Update visit mainly to the site.
28th April – 29th May 2009; 2nd June – 9th July 2009	All woodlands, including Havant Thicket area.
9th May - 26th June 2018	Entire site; selected areas within Havant Thicket, SCP and south-east part of Blendworth Common.
22 July 2019	All watercourses within the grassland areas, plus Upper Lake.

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The NVC surveys were coordinated by Simon Boswell, Principal Ecologist of ECOSA and carried out by John Norton, an experienced botanical surveyor, assisted by Debbie Allan.

2.5 Survey and Desk Study Limitations

The vegetation survey focused on identifying important habitat and species within the site and adjacent land within Havant Thicket woodland. The survey did not aim, although every effort was made, to identify all higher and lower plants supported by the site. However detailed vegetation surveys of the site have spanned multiple years by an experienced botanist and it is likely that the vast majority of species supported by the site have been identified.

Due to the large size of the site and the presence of complex patterns of vegetation (particularly over the grassland areas) it was not possible to carry out fine scale mapping to NVC level for the whole site; however, notes were made on NVC communities and sub-communities during all of the surveys and the species rich marsh was mapped in detail during the visits in 2018 and 2019.

During 2018 full surveys of Havant Thicket woodland, SCP and Bells Copse were not undertaken, these areas are not within the site but are part of the wider site proposed for mitigation and compensation works (ECOSA, 2018). However, these areas were surveyed between 2006 and 2009 (ECOSA, 2013). Given the wooded nature of these habitats they are not likely to have changed significantly in the 10 years that have elapsed and Forestry England have not undertaken any large-scale harvesting over this period. Where birch regeneration has taken place over heathland habitats typical representative blocks were surveyed in 2018 which provide a good indication of how such habitats have developed. The information collected previously has been used to support this assessment.

The June 2018 visits were undertaken during a long, hot dry spell when many spring and mid-summer flowering species will have died back and become impossible to detect. It is therefore likely that some species will have been missed by the 2018 surveys. A few later flowering species are also likely to have been overlooked by the 2018 surveys. Considering the intensive survey effort of the site and surrounding areas over the last 10 years, both by ECOSA and HBIC this is not considered to be a significantly limitation to the overall assessment.

2.6 Criteria used to Assess Ecological Value[5]

The evaluation criteria used in this report are based on ECOSA's professional judgement and publicly available publications, survey data and other sources as

[5] Evaluation have been undertaken by Atkins in Chapter 9 on Biodiversity of the Environmental Statement. Criteria outlined in this section have been taken into account in the assessment

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referenced in the main text. The evaluation is based on a sliding scale of importance as follows; international and European, national, regional, county, local and site. There are a wide range of characteristics which contribute to the importance of ecological features, and these may justify an increase or reduction in the value of an ecological feature. Where deviations occur, these will be explained in the evaluation section of this report (Section 3.0). Current published relevant guidance, including information sources such as A Nature Conservation Review (Ratcliffe, 1977) and Guidelines for Ecological Impact Assessment in the United Kingdom (CIEEM, 2018) have also been used to inform the assessment.

Evaluation of the site for plants and habitats is based on ECOSA's best professional judgement considering the following factors:

- **Species rarity/vulnerability** – Relative rarity of and threat to plant species in England is based on extinction risk categories and criteria defined in 'A Vascular Plant Red List for England' (Stroh, et al., 2014). **Table C2** shows the relative extinction risk of species in different categories. Species in higher risk categories are considered to be of greater ecological value.

Table C2: Categories of extinction risk for UK plant species

Category	Definition	Relative Value
Regionally Extinct (RE)	Extinct in England but still present elsewhere in Great Britain	Greatest
Critically endangered (CR)	Extremely high risk of extinction in the wild	↓
Endangered (EN)	High risk of extinction in the wild	
Vulnerable (VU)	High risk of endangerment in the wild	
Near Threatened (NT)	Likely to become endangered in the near future	
Least Concern (LC)	Assessed as not threatened	Least
Other Categories		
Data Deficient (DD)	Taxa believed to have very restricted and quite possibly threatened populations, but insufficient data for analysis	
Waiting List (WL)	Full assessment not possible due to inadequate data, taxonomic uncertainties or uncertainties over native or archaeophyte[6] status	

- **Habitat and plant species distribution** - The HBIC consultation, species-specific information within a range of resources including local BAPs, lists of Habitats/Species of Principal Importance (previously Priority Habitats/Species

[6] A plant considered to have been introduced by humans to England prior to 1500 AD.

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under UKBAP) is used to determine the distribution of plant species and habitat types at various geographic scales.

- **Habitat quality** – In general, habitats with a greater diversity of species are considered to be of greater ecological value. Factors such as geology, hydrology, connectivity and management can affect the quality and diversity of a habitat.

- **Habitat size** – The extent of a habitat will affect its geographic scale of importance. Size thresholds associated with qualifying criteria for designated sites at various geographic scales have been referred to as an indication of the extent of a habitat that would make it important at that scale.

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3.0 BASELINE ECOLOGICAL CONDITIONS

3.1 Introduction

This section details the results of the 2018 vegetation survey work undertaken for the HTWSR site, along with survey data from previous years. It assesses the baseline ecological conditions of the site in respect of vegetation at the time the desktop study and vegetation survey were undertaken. The baseline draws on a wealth of historical and current data, relevant data from historic surveys has been included in the report to increase the understanding of the site in terms of vegetation.

3.2 Desktop Study Results[7]

3.2.1 Statutory Designated Sites

There are two statutory designated sites of nature conservation interest which include habitat types or plant species within their citations situated within two kilometres of the site boundary. These are:

- Hazleton Common (LNR) – Located approximately 890 metres north-west of the site and designated for supporting ancient woodland[8] plant species and a range of notable species.

- Dell Piece West (LNR) – Located 1.8 kilometres north-west of the site and designated for supporting a range of habitats including well wooded borders, unimproved grassland, damp marshy ground and a large shallow pond.

3.2.2 Non-Statutory Designated Sites

There are 63 non-statutory designated SINCs situated within two kilometres of the site boundary, all of which are partially or wholly designated for their botanical interest. The extent of the SINCs within the site are presented in Chapter B and Map B4 [9]. For the purpose of this report, only the non-statutory designated sites within or bounding the site have been considered. These are:

- Thicket Bottom (SINC) – Situated within and adjacent to the site on its southern boundary and designated for supporting pasture woodland and wooded commons, which are of considerable biological and historical interest.

- Middle Clearing (SINC) – Situated within the site boundary and designated for supporting ancient semi-natural woodland.

[7] Updated desk study information is included in the Desk Study Report in Appendix 9.1
[8] Ancient woodland is classified areas where there has been continuous or near continuous tree cover since at least 1600AD.
[9] This chapter and map have now been superseded by information in the Desk Study Report in Appendix 9.1

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- Thicket Bottom Woods and Lake (SINC) – Situated within and adjacent to the site on its southern boundary and designated for supporting ancient semi-natural woodland;

- Havant Thicket (SINC) – Situated within and adjacent to the site on its northern boundary and designated for supporting woodland where there is a significant element of ancient semi-natural woodland surviving, semi-natural woodland that comprises important community types of restricted distribution in the County, such as yew woods and alder swamp woods and pasture woodland and wooded commons, which are of considerable biological and historical interest. The site also supports semi-improved grasslands which retain a significant element of unimproved grassland, areas of heathland which have become afforested or have succeeded to woodland and wetland habitat that supports a flora and fauna characteristic of unimproved and waterlogged conditions. The areas of Havant Thicket SINC within the site comprise The Corsican Pine Plantation (see **Map C2**) and the access track.

- Havant Thicket (South-West Corner) (SINC) – Situated adjacent to the site on its northern boundary and designated for supporting woodland where there is a significant element of ancient semi-natural woodland surviving, and heathland that retains significant remnants of heathland vegetation which would enable recovery;

- Hammond's Lands Copse (SINC) – Situated adjacent to the site on its south-eastern boundary and designated for supporting ancient semi-natural woodland;

- Lower Beacon Field (SINC) – Situated adjacent to the site on its southern boundary and designated for supporting agriculturally unimproved grasslands;

- Thicket Lawn (SINC) – Situated adjacent to the site on its southern boundary and designated for supporting agriculturally unimproved grassland and a range of notable plant species including smooth brome *Bromus racemosus*;

- Cabbagefield Row (SINC) – Situated within and adjacent to the site on its western boundary and designated for supporting ancient semi-natural woodland;

- Dunsbury Hill Grassland 2 (SINC) – Situated adjacent to the site on its western boundary and designated for supporting semi-improved grasslands which retain a significant element of unimproved grassland;

- Bell's Copse (SINC) – Situated adjacent to the site on its western boundary and designated for supporting ancient and semi-natural woodland and other

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woodland where there is a significant element of ancient semi-natural woodland surviving;

- Blendworth Common (South) (SINC) – Situated adjacent to the site on its north-western boundary and designated for supporting agriculturally unimproved grasslands;
- Blendworth Common (North) (SINC) – Situated adjacent to the site on its north-western boundary and designated for supporting agriculturally unimproved grasslands;
- Idsworth Common (SINC) – Situated within (access road) adjacent to the most-northerly part of the site and designated for supporting woodland where there is a significant element of ancient semi-natural woodland surviving, pasture woodland and wooded commons which are of considerable biological and historical interest.

3.2.3 Ancient Woodland Inventory and Priority Habitats

Within the site there are four Ancient Woodland Inventory (AWI) (Thomas, 1994) sites, all of which are designated as Sites of Importance for Nature Conservation (SINCs). The Avenue, Round Wood and Middle Clearing are designated as Ancient Semi-Natural Woodland (ANSW). The Corsican Pine Plantation is designated as Plantation on Ancient Woodland Sites (PAWS). A significant part of Havant Thicket woodland to the north of the site is listed as PAWS. Bell's Copse, located to the west of the site, also located within the wider site is also listed as ANSW. The northern section of Bells Copse has been designated as PAWS since production of the 2009 report, even though the area north of the watercourse still comprises predominantly a bracken clearing with some scrub.

Within the site, part of The Avenue is also listed as Lowland Mixed Deciduous Woodland Priority Habitat (see **Map C5**). No other Priority Habitats have been recorded within the site within Natural England's data set.

According to the Natural England Priority Habitats inventory Havant Thicket woodland to the north of the site contains four areas of Priority Habitats comprising; Purple Moor Grass and Rush Pasture, Lowland Dry Acid grassland, Wet Woodland and Lowland Mixed Deciduous Woodland. The extent of these habitats is presented in **Map C5**. It should be noted that Priority Habitats inventory mapping should be treated with caution as it may be based on older and in some cases less accurate data.

During vegetation surveys undertaken by WYG in 2014 on 'land east of Horndean' approximately 350 metres north-west of the site (WYG, 2014) an area of Lowland

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Meadow Priority Habitat was recorded which is not recorded on Natural England's Priority Habitat's Inventory, the location of this habitat is shown on **Map C5**.

3.2.4 Notable Species Desktop Study Results

The HBIC data search returned 73 notable plant records which intersect with or are entirely within the site comprising 22 species. Of these, 45 records were recorded by ECOSA during the surveys undertaken between 2006 and 2009. These records are considered by the 2018 survey and have therefore been excluded from the desktop study data. Of the remaining 28 records, 12 have site names and grid references which could relate to the site or wider-site areas within Havant Thicket woodland. The results of the HBIC data search are shown within **Table C3** and **Map C4**.

Hairy rock-cress *Arabis hirsuta* was recorded from a road verge along the A3, and has a preference for chalk grassland, chalk pits and on banks. As these habitats are not present within the site this species is not covered further in this report. All other species are discussed further within this report.

Table C3: HBIC desktop study notable plant records from within or intersecting with the site

Site Name	Grid Reference	Common Name	Scientific Name	Recorded	Number of Records	Site Name Location
A3 Verges Bedhampton/Cowplain	SU7010	Hairy Rock-cress	*Arabis hirsuta*	1988	1	Off-site
Bell's Copse	SU7010	Heather	*Calluna vulgaris*	1997	1	Off-site
	SU708104	Dyer's greenweed	*Genista tinctoria*	1997	1	
	SU7010	Western pouncewort	*Lejeunea lamacerina*	1996	1	
	SU7010	Wood-sorrel	*Oxalis acetosella*	1997	1	
Cabbagefield Row	SU707094	Wood-sorrel	*Oxalis acetosella*	2000	1	Off-site
	SU707094	Heath speedwell	*Veronica officinalis*	2000	1	
Durrants	SU723098	Lesser spearwort	*Ranunculus flammula*	1998	1	Off-site
	SU723098	Marsh pennywort	*Hydrocotyle vulgaris*	1998	1	
	SU723097	Marsh speedwell	*Veronica scutellata*	1998	1	

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Site Name	Grid Reference	Common Name	Scientific Name	Recorded	Number of Records	Site Name Location
	SU723098	Tormentil	*Potentilla erecta*	1998	1	
Havant Thicket	SU713103	Bitter-vetch	*Lathyrus linifolius*	1998	2	Possibly on-site
	SU7210	Devil's-bit scabious	*Succisa pratensis*	1999	1	
	SU7210	Heather	*Calluna vulgaris*	1999	1	
	SU7210	Lesser spearwort	*Ranunculus flammula*	1999	1	
	SU714103	Ragged-robin	*Silene flos-cuculi*	1998	1	
	SU716102	Heath speedwell	*Veronica officinalis*	1998	1	
	SU7210	Heath speedwell	*Veronica officinalis*	1999	1	
Havant Thicket woodland	SU7110	Cross-leaved heath	*Erica tetralix*	1999	1	Possible on-site (northern access track only)
	SU7110	Heath milkwort	*Polygala serpyllifolia*	1999	1	
	SU7110	Heather	*Calluna vulgaris*	1999	1	
	SU7110	Lesser spearwort	*Ranunculus flammula*	1999	1	
	SU7110	Marsh pennywort	*Hydrocotyle vulgaris*	1999	1	
	SU7110	Tormentil	*Potentilla erecta*	1999	1	
	SU7110	Wood-sorrel	*Oxalis acetosella*	1999	1	
Horsefoot Hill (Havant Thicket Woodland)	SU7111	Bitter-vetch	*Lathyrus linifolius*	1997	1	On-site
	SU7111	Wild strawberry	*Fragaria vesca*	1997	1	
Thicket Bottom	SU714101	Marsh St John's-wort	*Hypericum elodes*	2000	1	On-site

Within the HBIC data search there were also a number of records which fall entirely within or intersect with the wider site boundary. Within these records a number of

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species have site names or grid references which confirm or indicate that the records were made from within the wider site boundary. These species and the locations they were recorded is presented in **Table C4**. ECOSA records from 2008-2009 returned with the HBIC data search have been excluded.

Table C4: HBIC data of species recorded from the wider site

Common Name	Scientific Name	Recorded Locations
Bell heather	*Erica cinerea*	Havant Thicket woodland
Bitter-vetch	*Lathyrus linifolius*	Bells Copse, Havant Thicket woodland
Common cow-wheat	*Melampyrum pratense*	SCP
Common valerian	*Valeriana officinalis*	Bells Copse
Corn mint	*Mentha arvensis*	Havant Thicket woodland
Cross-leaved heath	*Erica tetralix*	Havant Thicket woodland
Devil's-bit scabious	*Succisa pratensis*	Bells Copse, Havant Thicket woodland
Dyer's greenweed	*Genista tinctoria*	Bells Copse, Havant Thicket woodland
Goldenrod	*Solidago virgaurea*	Bells Copse, Havant Thicket woodland, SCP
Heath milkwort	*Polygala serpyllifolia*	Havant Thicket woodland
Heath speedwell	*Veronica officinalis*	Bells Copse, Havant Thicket woodland, SCP
Heather	*Calluna vulgaris*	Bells Copse, Havant Thicket woodland
Lesser spearwort	*Ranunculus flammula*	Bells Copse, Havant Thicket woodland, SCP
Marsh pennywort	*Hydrocotyle vulgaris*	Havant Thicket woodland
Marsh St John's-wort	*Hypericum elodes*	SCP
Ragged-robin	*Silene flos-cuculi*	Havant Thicket woodland
Sanicle	*Sanicula europaea*	Bells Copse, Havant Thicket woodland, SCP
Tormentil	*Potentilla erecta*	Bells Copse, Havant Thicket woodland, SCP
Western pouncewort	*Lejeunea lamacerina*	Bells Copse
Wild strawberry	*Fragaria vesca*	Bells Copse, Havant Thicket woodland, SCP

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Common Name	Scientific Name	Recorded Locations
Wood-sorrel	*Oxalis acetosella*	Bells Copse, Havant Thicket woodland, SCP

3.3 Vegetation Survey Results

3.3.1 Grassland

Summary

In 2018 much of the grassland within the site was either unmanaged or more lightly grazed in places since the previous surveys ten years or so ago, with the result that a lot of it has become overgrown. This was because fences were being replaced and as a result grazing was not possible. The exception was area G6 (Gipsies Plain) which was well grazed by livestock in 2018. These animals also had free access into G7 and had grazed the northern and eastern part of this area. Grazing, by livestock or possibly deer, was also evident in the southern parts of G1 and G2 during the present survey. Historically, the site had been well grazed by horses in the east, but less so in the west, where several areas were already rank and unmanaged in 2006. Most of the grazing in the east is now carried out using sheep from Staunton Country Park.

The grassland was previously described as being neutral and semi-improved in nature, strongly grass-dominated and relatively herb poor throughout. Roughly half the grassland on the site was mapped as dry to damp semi-improved grassland (NVC: MG1 and MG6a) and half as damp to wet semi-improved grassland (predominantly MG6a/MG10a transitions, MG9 and small pockets of other types). Marshy vegetation was present next to the main streams and along seepage lines and ditches within G11 and elsewhere. This consisted of rush pasture (MG10a/b, M23a/b) and stands of marginal wetland vegetation (S22 and S23) and was species rich in several places.

By 2018, the under grazing combined with a run of wet winters had allowed several species of acidic marshy grassland to become abundant to locally dominant over large parts of the site in the areas previously mapped as damp to wet semi-improved grassland. These include compact rush *Juncus conglomeratus*, velvet bent *Agrostis canina,* marsh thistle *Cirsium palustre*, lesser spearwort *Ranunculus flammula* and greater bird's-foot-trefoil *Lotus pedunculatus*. Drier areas still support neutral semi-improved grassland, but this has become a little more dominated by the coarser, tussock-forming grasses, especially false oat-grass *Arrhenatherum elatius*, cock's-foot *Dactylis glomerata* and tall fescue *Schedonorus arundinaceus*. The marshy areas have also become a little more overgrown, but still retain some pockets of herb rich rush-dominated vegetation. Scrub encroachment, particularly by grey willow (sallow) and alder *Alnus glutinosa* has occurred next to some of the watercourses.

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Previously, much of the neutral grassland was assigned to MG6a or MG6a-MG10a transitions (typical of semi-improved, grazed pastures), with MG1a in unmanaged dry areas, MG9 in the wet areas (characterised by tufted hair-grass *Deschampsia cespitosa*) and M23a/M23b in the rush-dominated marshy areas along the watercourses. The latter type corresponds to the Purple Moor Grass and Rush Pastures Priority Habitat[10] (see **Map C8**). It should be noted that Purple Moor-grass *Molinia caerulea* is not usually present in M23 and is virtually absent from the reservoir site, though does occur on Blendworth Common (see below) and in Havant Thicket.

In 2018 the presence of the increasing species mentioned above means that much of the MG6a grassland is now transitional to M23a rush pasture, though most of this is still relatively species poor and is missing sharp-flowered rush, one of the key constituents, so does not qualify as Priority Habitat. In the descriptions below this is listed as 'MG6a-M23a transition'. None of the dry grassland is of sufficient species richness to map as MG5, which would place it in the Lowland Meadows Priority Habitat. Locally some of the grassland may have derived from MG6b, the more species rich sub-community of MG6.

G15 (part of Blendworth Common, see **Map C6**) consists mostly of dry acid grassland with invasion by bracken *Pteridium aquilinum*, referable to NVC type U20a or partly to U4c. Small areas of U4a or U4b also occur in the existing Forestry England car park area (G13). Most of the acid grassland in these areas qualifies as Lowland Dry Acid Grassland Priority Habitat.

Table C5 provides further details of the grassland vegetation types mapped in **Map C7**, with notes on NVC types and their extent over the site. Full details of the NVC types and their extents for other on-site habitats are presented in **Appendix C5**, **Table C17**. In the descriptions of each target note area, the NVC types listed at the end are given in approximate decreasing order of extent/area. Full names of NVC types are given in **Appendix C4**.

[10] Within this report Priority Habitat is used rather than Habitats of Principal Importance

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Table C5: Summary of grassland vegetation types used in habitat mapping (**Map C7**)

Mapped Vegetation Type	NVC Types and Extent	Priority Habitat
Dry neutral to acid grassland	Predominantly herb poor dry grassland (**MG6a**) with some moderately herb rich grassland (**MG6b and MG5a**) in a few small areas. Includes areas of ranker herb poor grassland (**MG1a**), especially west of the northern half of the Avenue (G10) and on the hill slope in the south-west (G11). Enriched rough grassland (**MG1b**) occurs in small stands only. Improved herb poor dry grassland (**MG7b**) occurs over most of Gipsies Plain (G6) and next to Havant Thicket car park (G14).	No (no large or well-defined areas of MG5a occur that would qualify as Lowland Meadows)
Dry acid grassland and bracken	Moderately herb rich dry acid grassland with bracken (**U20a**) covers most of the Blendworth Common survey area (G15); some damper areas could be assignable to (**U4c**) and herb rich areas without bracken are transitional to **MG5c**. Herb rich acid grassland (**U4b**) occurs in the grassy clearing to north-west of Havant Thicket car park (G13).	Yes (Lowland Dry Acid Grassland)
Damp to wet grassland and developing rush pasture	Damp species poor to moderately herb rich grassland consisting of transitions between **MG6a** and **MG10a** or **M23a** over much of the site, with **MG9** dominant in G9 and G10. **MG6a-M23a** transitions may have frequent marsh thistle, lesser spearwort, greater bird's-foot-trefoil or other characteristic M23 species but lack any sharp-flowered rush. Wetter species poor grassland (**MG7d**) occurs in south-west of G1 and south-east corner of G11, with **MG13** locally in small grazed hollows. Wet, species poor rank grassland in G11 may be assignable to **MG12a**.	No
Species poor rush pasture and wetland vegetation	Relatively herb poor marshy vegetation with frequent to abundant rushes (**MG10a** and **MG10b**); occurring in flushes and along spring lines and watercourses. Includes small, localised stands of sweet-grass (**S22**) and marginal wetland plants, such as fool's-watercress (**S23**).	No
Species rich marsh and rush pasture	Better developed, species rich areas of **M23a** and **M23b** where sharp-flowered rush is usually present, and other rushes are frequent to abundant. At the southern end of watercourse S2 and within Upper Lake the vegetation is more strongly acidic and transitional to **M29**. There is an area of Purple Moor-grass mire (**M25b**) at the southern end of Blendworth Common (G15).	Yes (Purple Moor Grass and Rush Pastures)

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G1

Previously recorded as area A1 (ECOSA, 2013). Predominantly dry, to locally damp, semi-improved, herb-poor grassland. Possibly some recent grazing management in 2018 (**Figure 1** and **Figure 2**). The sward is dominated by common bent *Agrostis capillaris*, creeping bent *Agrostis stolonifera* and Yorkshire-fog *Holcus lanatus* with frequent soft rush *Juncus effusus* and compact rush. Other species recorded during the present survey include crested dog's-tail *Cynosurus cristatus* (LF), meadow brome *Bromus commutatus* (LF), velvet bent (LA) and tufted hair-grass (O-LF). Rough areas have locally abundant false oat-grass and cock's-foot. creeping soft-grass *Holcus mollis* is occasional in dry areas. There is an area of wet improved grassland at the south-west corner with frequent perennial rye-grass *Lolium perenne* and meadow foxtail *Alopecurus pratensis*.

Other damp areas have denser rushes, abundant common fleabane *Pulicaria dysenterica*, locally frequent marsh thistle and greater bird's-foot-trefoil. Other species recorded include false fox-sedge *Carex otrubae* (R), oval sedge *Carex leporina* (LF), docks *Rumex* species, creeping buttercup *Ranunculus repens* (LA), common knapweed *Centaurea nigra* (R-LF), cat's-ear *Hypochaeris radicata* (LF), corky-fruited water-dropwort *Oenanthe pimpinelloides* (LF at southern end) and creeping thistle *Cirsium arvense*.

NVC: MG1a, MG6a, MG6a-M23a transition, MG10a, MG7d.

Figure 1: G1 26th June 2018

Figure 2: G1 26th June 2018

G2

Previously recorded as area B1 (ECOSA, 2013). Dry to damp semi-improved grassland with areas of wetter grassland and rush pasture, especially next to the streams on either side. Previously lightly grazed or ungrazed, but not recently managed in 2018 (**Figure 3** and **Figure 4**). The grassland is composed of Yorkshire-fog, sweet vernal-grass *Anthoxanthum odoratum*, rough meadow-grass *Poa trivialis*, red fescue *Festuca rubra*, crested dog's-tail and other grasses, with invasion by frequent to locally

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abundant soft rush, compact rush and common fleabane. Other species include marsh thistle (O), lesser spearwort (O), creeping buttercup, meadow buttercup *Ranunculus acris*, docks, tufted hair-grass (O), hoary ragwort *Senecio erucifolius* and meadow brome (O). There is also floating sweet-grass *Glyceria fluitans* in wet areas. Ragged-robin *Silene flos-cuculi* is present at the southern end at approximately SU 7110 0982.

NVC: MG1a, MG6a, MG6a-M23a transition, MG10a, M23a, S22.

Figure 3: G2 30th May 2018

Figure 4: G2 26th June 2018

G3

Previously recorded as area B4 (ECOSA, 2013). Area has previously been grazed but no recent management in 2018 (**Figure 5** and **Figure 6**). An area of largely dry tussocky grassland dominated by common bent, Yorkshire-fog and red fescue. Since previous surveys undertaken velvet bent is now abundant and oval sedge is present. A few herbs survive in small dry patches, including common knapweed and common sorrel *Rumex acetosa*, and a patch of creeping soft-grass. A damper depression at the southern end has frequent soft rush, lesser spearwort and greater bird's-foot-trefoil. Marsh thistle and compact rush are occasional over the area. At the south-west corner there is an area of poached mud by the stream with some wet grassland and marsh (see Paragraph 3.3.4).

NVC: MG1a, MG6a/b-M23a transition, M23a.

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Figure 5: G3 26th June 2018

Figure 6: G3 26th June 2018

G4

Previously recorded as area C2 (ECOSA, 2013). A triangle of dry to damp semi-improved grassland lying between the north end of the Avenue and the Corsican Pine Plantation, bounded on east side by a small watercourse (S3). The grassland has locally abundant rough meadow-grass, common fleabane, creeping buttercup, rushes and greater bird's-foot-trefoil (**Figure 7** and **Figure 8**). Other species in the drier, more herb rich grassland at the northern end include hoary ragwort, common sorrel (LF), common knapweed (LF) and cat's-ear.

NVC: MG5a, MG6b/MG7d-MG10a transition.

Figure 7: G4 20th June 2018

Figure 8: G4 20th June 2018

G5

Grassland on northern part of the site to east of the Avenue (**Figure 9** and **Figure 10**); meeting The Avenue between the two watercourses on its east side; partly bounded by the bridleway track to the south. Previously recorded as areas C1, C3 and D1 (ECOSA, 2013); now combined. Several semi-mature pedunculate oak trees are present in the southern part.

When this area was surveyed in 2009 it was horse-grazed; supporting damp, species poor semi-improved grassland composed of common bent and Yorkshire-fog with

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abundant common fleabane on the west side, frequent creeping buttercup and thin patches of soft rush and compact rush. The northern edge was better-drained and grass-dominated.

The drier eastern third of the area had not significantly changed by 2018, but had become a little ranker. Other grasses present include false oat-grass, red fescue, smooth meadow-grass *Poa pratensis* and sweet vernal-grass. Common sorrel is a rare species within the grassland. The damper middle and western areas (north of the track) still support frequent to abundant common fleabane, but there is now also abundant compact rush and large patches of marsh thistle. One patch of sharp-flowered rush *Juncus acutiflorus* was recorded. Other species include oval sedge, rough meadow-grass (A), crested dog's-tail, greater bird's-foot-trefoil (O-LF) and curled dock *Rumex crispus*.

The area south of track T16 (previously C3) was recorded as dry to damp, moderately herb-rich semi-improved grassland with abundant common fleabane and hoary ragwort, frequent common bird's-foot-trefoil, creeping buttercup and hairy sedge *Carex hirta*, with rare common knapweed. The area appears to have become wetter and has colonised with dense compact rush, marsh thistle and lesser spearwort. Also with velvet bent and smooth brome *Bromus racemosus* present. At the southern end, near to the stream (S4) are common spotted-orchid *Dactylorhiza fuchsii* (four flower spikes) and ragged-robin, also with abundant oval sedge and some red clover *Trifolium pratense*. Ragged-robin is also present on the north side of the track (T16). Cuckooflower *Cardamine pratensis* is occasional in these wet grassland areas.

A shallow ditch crosses the eastern side of G5. It supports low-growing bramble scrub and thin stands of rush pasture and marshy vegetation typical of other parts of the site, composed of soft rush and common fleabane with tufted hair-grass, tormentil *Potentilla erecta*, marsh thistle, water figwort *Scrophularia auriculata* and common marsh-bedstraw *Galium palustre*. Banks support some acid grassland species, including wood sage *Teucrium scorodonia* and slender St John's-wort *Hypericum pulchrum*.

NVC: MG6a, MG6a/MG10a-M23a transition, MG10a, M23a.

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Figure 9: G5 30th May 2018

Figure 10: G5 20th June 2018

G6

Located on Gipsies Plain in the east of the site and previously recorded as area E (ECOSA, 2013). This was ungrazed in 2006 but grazed in 2008 and in 2018 by sheep (**Figure 11** and **Figure 12**). It was formerly semi-improved species poor grassland with frequent false oat-grass, cock's-foot and tufted hair-grass. It is now relatively strongly improved with the more enriched areas being dominated by perennial rye-grass and crested dog's-tail, and the remainder composed of Yorkshire-fog, red fescue, common bent, sweet vernal-grass and rough meadow-grass. Cock's-foot is still frequent. It is herb poor throughout (white clover *Trifolium repens* the only species recorded, though other typical species may be present).

NVC: MG6a, MG7b, MG9.

Figure 11: G6 20th June 2018

Figure 12: G6 20th June 2018

G7

Previously recorded as area F (ECOSA, 2013). A large expanse of grassland lying between the southern part of the Avenue and Gipsies Plain (**Figure 13** and **Figure 14**). This previously comprised damp semi-improved grassland, with scattered rushes, and was grazed by horses. It is still lightly grazed by sheep. Damp areas have colonised with abundant compact rush and marsh thistle, also with frequent greater bird's-foot-trefoil and locally abundant velvet bent. Herb diversity is otherwise low, with red clover

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and lesser stitchwort *Stellaria graminea* recorded. Typical pasture grasses make up the sward, including Yorkshire-fog, red fescue, common bent, rough meadow-grass, crested dog's-tail and sweet vernal-grass. There is some rougher grassland in places. Tufted hair-grass is occasional.

There is an area of acidic to locally base rich marshy vegetation on the western side next to the Avenue (shown on old maps as Thicket Bottom). Here there is a stand of lesser pond-sedge *Carex acutiformis* and some scattered common reed *Phragmites australis* in the wettest part. The marsh is otherwise rush-dominated, with some willow scrub developing. Other species include sharp-flowered rush (LF), soft rush (A), compact rush (A), marsh thistle (LA), common fleabane, common marsh-bedstraw, velvet bent, hairy sedge, hoary willowherb *Epilobium parviflorum*, water mint and lesser spearwort. A plant of common yellow-sedge *Carex demissa* was recorded in the middle of the area to the east of the marsh.

NVC: MG6a/MG10a-M23a transition, MG10a, MG10b, M23a, M23b.

Figure 13: G7 30th May 2018

Figure 14: G7 20th June 2018

G8

Previously recorded as areas G1 and G2 (ECOSA, 2013). Mostly wet grassland which partly surrounds Round Wood to the west, north and east of it; bounded by a watercourse to the north (**Figure 15** and **Figure 16**). This area was ungrazed and fairly long in 2006 and been intermittently grazed since. It was not grazed in 2018 due to the ongoing fencing repairs. It is composed largely of Yorkshire-fog, common bent, tufted hair-grass (frequent to dominant) and velvet bent, with patches of soft rush and hard rush *Juncus inflexus*. Marshy vegetation occurs next to the stream (see S6 and S7).

NVC: MG9, MG10a, MG6a, M23a.

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Figure 15: G8 20th June 2018

Figure 16: G8 20th June 2018

G9

Previously recorded as area G3 (ECOSA, 2013). A triangle of dry to damp and marshy grassland on west side of the Avenue, between the two watercourses. Since previous surveys it may have scrubbed over more with willow in the wetter northern and south-eastern corners. The grassland is dominated by Yorkshire-fog, tufted hair-grass, red fescue and bent grasses, with locally abundant rushes and marsh thistle. Herbs include locally frequent buttercups and lesser spearwort (**Figure 17** and **Figure 18**).

NVC: MG6a, MG9, MG10a, M23a.

Figure 17: G9 9th May 2018

Figure 18: G9 26th June 2018

G10

Previously recorded as area B2 (ECOSA, 2013) and described as dry semi-improved grassland (MG6a) grading into *Holcus-Deschampsia* grassland (MG9b) at the southern boundary. Areas of damp semi-improved grassland (MG6a/MG10a) and wet rush pasture (MG23b) occur along the eastern boundary stream, supporting stands of *Juncus effusus* and *J. acutiflorus*, with frequent *Ranunculus flammula*.

At that time, it was mostly rank and undergrazed. In 2018 the area had also not been grazed (**Figure 19** and **Figure 20**). The dry grassland had become much ranker, now dominated by Cock's-foot with False Oat-grass. The west side next to Middle Clearing

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has developed into a dense stand of soft rush, compact rush and marsh thistle with locally abundant lesser spearwort. There are patches of marsh next to the streams (S5 and S6). Next to The Avenue alder scrub has developed, with a large strip of great horsetail *Equisetum telmateia*. Ragged-robin and bugle *Ajuga reptans* are present in wet grassland near to the streams. A patch of crosswort *Cruciata laevipes* was recorded in the grassland in 2018.

NVC: MG1a, MG6a-M23a transition, MG9, M23a, MG13, MG10b.

Figure 19: G10 26th June 2018

Figure 20: G10 26th June 2018

G11

Previously recorded as area H by ECOSA in 2009 (ECOSA, 2013). The grassland along the western half at the top of the slope, and also in the north-eastern quarter is very rank, being dominated by tall fescue and cock's-foot (this would have consisted of semi-improved damp pasture in the past). The grassland is moderately herb rich in the middle of the slope, with hoary ragwort, lesser stitchwort, cat's-ear, common knapweed, ribwort plantain *Plantago lanceolata*, common sorrel and meadow buttercup. A small patch of corky-fruited water-dropwort is present (**Figure 21** and **Figure 22**).

There is a seepage line running north to south down the middle of the area, and east of here various spring lines and flushed areas, draining into the stream (S7). Some of these have scrubbed over with willow and alder since the previous survey. The flora of these marshy areas is broadly similar to that described previously but generally the area appears much more overgrown; marsh thistle and compact rush have become much more abundant, and trailing tormentil *Potentilla anglica* has also become abundant over large areas (on drier ground between the spring lines). Otherwise, these areas are dominated by sweet vernal-grass and soft rush, but sharp-flowered rush, hard rush and velvet bent are also locally frequent. Other herbs include lesser spearwort (LF), common fleabane (LA), clustered dock *Rumex conglomeratus*, common sorrel, greater bird's-foot-trefoil, common marsh-bedstraw, water figwort, tufted forget-me-not *Myosotis laxa* and square-stemmed St John's-wort *Hypericum*

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tetrapterum. Drier parts are mainly mixtures of Yorkshire-fog, compact rush and soft rush.

The south-eastern part of the area also supports large patches of hairy sedge in slightly base-rich wet grassland. Tufted hair-grass is also occasional throughout the wetter parts of the field. Deer-grazed patches at the far south-eastern and north-eastern corners support creeping bent, meadow foxtail, marsh foxtail *Alopecurus geniculatus* and creeping buttercup (NVC: MG13). Small sweet-grass *Glyceria declinata* was also previously recorded at the north-eastern corner (just south of Middle Clearing).

Previous surveys recorded a very small strip (a few square metres) of heathy acid grassland present along the eastern margin of the field, next to the open section of the stream (S7). This supported pill sedge *Carex pilulifera*, common dog-violet *Viola riviniana* and heath speedwell *Veronica officinalis*. This feature was not recorded during the 2018 survey, but it is assumed to still be present.

NVC: MG1a, MG12a, MG10a, M23b, MG7d and various transitions between MG6a/b, MG10a and M23a.

Figure 21: G11 20th June 2018

Figure 22: G11 20th June 2018

G12

Previously recorded as area A2 (ECOSA, 2013). Described as mainly damp semi-improved grassland, with occasional to frequent tufted hair-grass, with two patches of common fleabane on west side (**Figure 23** and **Figure 24**). In 2018 the area was ungrazed, and parts had become very rank, now dominated by mixtures of tall fescue, common couch *Elytrigia repens* and cock's-foot. Damper areas are now dominated by compact rush, marsh thistle and common fleabane, with locally abundant lesser spearwort. Tufted hair-grass is a little more frequent than previously. Other grasses include Yorkshire-fog, perennial rye-grass, rough meadow-grass, crested dog's-tail (LA) and common bent. A patch of meadow barley *Hordeum secalinum* was recorded at the northern end. Other species recorded include meadow vetchling *Lathyrus pratensis* and oval sedge.

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A valley and seepage lines run down the slope towards Middle Clearing. At the drier end the valley is dominated by soft rush and hard rush with some sharp-flowered rush and clumps of remote sedge *Carex remota*. Also present are compact rush, marsh thistle, curled dock, hoary ragwort, greater bird's-foot-trefoil and common marsh-bedstraw (R).

NVC: MG1a, MG9/MG10a-M23a transition, MG12a.

Figure 23: G12 30th May 2018

Figure 24: G12 26th June 2018

G13

Short-mown acid grassland on a picnic area (lying within area W14). Moderately species rich, but rather grass-dominated due to partial shading by surrounding trees. Species include the moss *Rhytidiadelphus squarrosus*, fine-leaved sheep's-fescue *Festuca filiformis*, sweet vernal-grass, field wood-rush *Luzula campestris*, pill sedge, tormentil, selfheal *Prunella vulgaris*, cat's-ear, heath speedwell and a patch of devil's-bit scabious *Succisa pratensis* at SU 7213 1044.

NVC: likely to be closest to U4b.

G14

An area of regularly mown grassy vegetation next to by the main Havant Thicket woodland car park, created relatively recently by clearance of some trees and scrub (**Figure 25** and **Figure 26**). Next to the car park it consists of improved grassland grading into dry acid grassland composed of common bent, sweet vernal-grass and other grasses, with patches of pill sedge and frequent tormentil. The remaining two-thirds of the area is wet grassland and rush pasture mosaic with hard rush, sharp-flowered rush, jointed rush *Juncus articulatus*, common yellow-sedge and other sedges. Herbs include buttercups, lesser spearwort, common fleabane, cuckooflower and lesser trefoil *Trifolium dubium*. There are some patches of *Sphagnum denticulatum*.

NVC: U4a, M23a, MG7.

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Figure 25: G12 30th May 2018

Figure 26: G12 26th June 2018

G15

The Blendworth Common survey area supports acidic, moderately species rich unimproved grassland with bracken on a gentle slope (**Figure 27** and **Figure 28**). At the southern edge there is an area of wetter, marshy grassland and a small area dominated by purple moor-grass. There are a number of mature pedunculate oak trees scattered over the area (about 25 trees) and part of a damp gully dominated by a line of tall, mature aspen *Populus tremula* (mapped here under the willow scrub category).

A combined species list for the visits is given in **Table C6** and a species summary is presented in **Table C7**. In **Table C6** acid grassland indicators are shortened to 'A', neutral to acid grassland as 'G' and Ancient Woodland Vascular Plants 'W'.

Management of the site appears to have been by regular mowing in both 2009 and 2018. In 2018 the grassland was short to medium length (under 30 centimetres in height during the June survey) and the bracken was mostly of open, scattered fronds with some denser patches, growing up to about 50 centimetres. The grassland had been cut a little shorter along the eastern boundary and there were areas of short grassland and bare ground along vehicle tracks. At the northern end of the area there is frequent cock's-foot, possibly indicating past improvement through fertiliser treatment.

Beyond the survey area to the west the land slopes more steeply down to a watercourse, which was not surveyed. The slope supports damper herb rich acid grassland with abundant marsh thistle.

The grassland is composed of mixtures of grasses and occasional rushes typical of dry to moist acidic soils, especially common bent, velvet bent, sweet vernal-grass, red fescue, Yorkshire-fog, tufted hair-grass and more locally, purple moor-grass. Hairy wood-rush *Luzula multiflora* is also abundant. Two sedges have been recorded; common yellow-sedge and pill sedge.

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The most abundant herb species are tormentil and slender St John's-wort. Tormentil was forming large creeping patches over much of the site at the time of the June 2018 visit. Other frequent or locally frequent species include common knapweed, blue fleabane *Erigeron acris*, bitter-vetch *Lathyrus linifolius*, greater bird's-foot-trefoil, heath milkwort *Polygala serpyllifolia*, selfheal, lesser stitchwort, germander speedwell *Veronica chamaedrys* and common dog-violet. Other notable/noteworthy species include dwarf gorse *Ulex minor*, heather *Calluna vulgaris*, devil's-bit scabious, goldenrod *Solidago virgaurea* and heath bedstraw *Galium saxatile*. The moss *Pseudoscleropodium purum* is abundant over much of the area (a characteristic species of dry, unimproved grassland). Bugle and wood anemone *Anemone nemorosa* were both recorded as locally frequent in the south-east of the site during the spring visits, though they may be more widespread. There are also some scattered plants of bluebell *Hyacinthoides non-scripta*.

NVC: The majority of the grassland on the area can be considered to fall under U20a *Pteridium aquilinum-Galium saxatile* community, *Anthoxanthum odoratum* sub-community. The presumed regular mowing at this site has maintained an open, grassy, species rich version of this type. The grassland also has an affinity to U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, a type predominantly found in cooler, moister parts of Britain. Southern types of U4 are not described in the published NVC, but the vegetation here has a species composition indicative of both U4a Typical sub-community and U4c *Lathyrus montanus* [=*L. linifolius*]-*Stachys betonica* [=*Betonica officinalis*] sub-community. Other vegetation types represented in small parts of the survey area include M25b (at the southern end, where purple moor-grass is frequent) and transitions to MG5c.

Figure 27: G15 9th May 2018

Figure 28: G15 26th June 2018

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Table C6: Species list for G15 (Part of Blendworth Common)

Species	English name	Indicators	Frequency	Comments
Ferns and horsetails				
Pteridium aquilinum	Bracken		A	
Grasses, rushes and sedges				
Agrostis capillaris	Common bent		A	
Agrostis vinealis	Brown bent	A	A	
Anthoxanthum odoratum	Sweet vernal-grass		F	
Brachypodium sylvaticum	False brome		LF	May be restricted to south-east corner.
Carex demissa	Common yellow-sedge	G	R	Recorded as occasional at southern end in 2009.
Carex pilulifera	Pill sedge	A G	F	Not recorded in 2018 but still likely to be frequent.
Dactylis glomerata	Cock's-foot		LA	At northern end.
Deschampsia cespitosa	Tufted hair-grass		LF	
Festuca rubra	Red fescue		A	
Holcus lanatus	Yorkshire-fog		F	
Juncus acutiflorus	Sharp-flowered rush		LF	
Juncus conglomeratus	Compact rush		LA	Slope at western edge.
Juncus effusus	Soft rush		P	
Luzula multiflora	Hairy wood-rush	A	F-LA	
Luzula pilosa	Hairy wood-rush	W	R	
Molinia caerulea	Purple moor-grass	G	LA	Dense mown patch near to southern boundary.
Herbs				
Ajuga reptans	Bugle		LF	
Anemone nemorosa	Wood anemone	W	LF	
Centaurea nigra	Common knapweed		F	May be mainly in SE corner.

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Species	English name	Indicators	Frequency	Comments
Centaurium erythraea	Common centaury		P	
Cirsium palustre	Marsh thistle		LF	Also abundant on adjacent slope to west.
Erigeron acris	Blue fleabane	A	LF	
Galium saxatile	Heath bedstraw	A	P	Present but finished flowering, so not possible to estimate abundance.
Hyacinthoides non-scripta	Bluebell	W	R	
Hypericum pulchrum	Slender St John's-wort	A W	A	
Hypochaeris radicata	Cat's-ear		P	
Lathyrus linifolius	Bitter-vetch	G W	F	Classed as Near Threatened
Lotus pedunculatus	Greater bird's-foot-trefoil		LF	In damper ground.
Polygala serpyllifolia	Heath milkwort	A	LF	NT. Several patches on disturbed soil near eastern edge (e.g. SU 7084 1051), May 2018.
Potentilla anglica	Trailing tormentil	A	P	Recorded as rare in 2009.
Potentilla erecta	Tormentil	A	P	Classed as Near Threatened. Very abundant to dominant over most of site at June 2018 visit, forming dense trailing patches, flowering profusely.
Prunella vulgaris	Selfheal		F	
Ranunculus acris	Meadow buttercup		P	
Solidago virgaurea	Goldenrod	W	P	Classed as Near Threatened.
Stellaria graminea	Lesser stitchwort		F	
Succisa pratensis	Devil's-bit scabious	G	P	Classed as Near Threatened. Patch recorded at SU 70848 10573, but may be more frequent.
Taraxacum aggregate	Dandelion		P	

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Species	English name	Indicators	Frequency	Comments
Teucrium scorodonia	Wood sage		P	
Veronica chamaedrys	Germander speedwell		LF	
Vicia cracca	Tufted vetch		P	
Viola riviniana	Common dog-violet	A	LF	
Trees and shrubs				
Betula pubescens	Downy birch		LF	Young saplings/regeneration.
Calluna vulgaris	Heather	A	R	Classed as Near Threatened. Small patch recorded.
Lonicera periclymenum	Honeysuckle		O	
Populus tremula	Aspen	W	LF	Frequent scrub/small trees next to track, southern boundary.
Quercus robur	Pedunculate oak		F	Approximately 25 mature trees.
Rosa canina aggregate	Dog rose		O	
Salix cinerea subspecies *oleifolia*	Grey willow		O	Saplings/regeneration.
Ulex europaeus	Gorse		O	
Ulex minor	Dwarf gorse	A	P	Possibly rare. One patch recorded at SU 7080 1066.
Bryophytes				
Pseudoscleropodium purum			A	
Sphagnum species	Bog moss species		R	Recorded at southern end in 2009.

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Table C7: Blendworth Common species summary

Species Group / Status	Number of Species
Ferns and horsetails	1
Grasses, rushes and sedges	16
Herbs	25
Trees and shrubs	9
All vascular plants	**51**
Bryophytes	2
Acid grassland indicator species	12
Acid to neutral grassland indicator species	5
Ancient Woodland Vascular Plants	7
Near Threatened (England)	6

3.3.2 Woodland

Summary

The majority of Havant Thicket woodland is former heathland and scrubland on acid soils which was presumably historically used as common land for grazing and cutting of wood for fuel (Portsmouth Water, 2012). More recently, much of the site was converted to forestry, including both coniferous and broadleaved plantations. Presently, there is a mixture of old pine and spruce *Picea* plantation, mature beech *Fagus sylvatica* plantation, secondary broadleaved woodland and areas cleared 10-20 years ago that have reverted to birch dominated thickets. The forestry operations and lack of any recent grazing have caused most of the heathland vegetation to disappear, except for scattered patches of heather, Purple Moor-grass and other associated plants along the margins of the rides and in cleared areas. Much of the site is poorly drained and would have supported interesting wet heath and mire (bog) vegetation (see comments in Paragraph 3.3.3).

Large parts of the area were probably more open heathland in the past. However, the past and recent vegetation surveys have confirmed that there are small areas of apparently older semi-natural woodland associated with watercourses in the south-west of the Forestry England site (W8 and W9) and at the south-east corner of the Corsican Pine plantation (W11). These support small numbers of Ancient Woodland Vascular Plants (AWVP) and a semi-natural canopy of oak, ash *Fraxinus excelsior*, field maple *Acer campestre* and alder.

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Historic maps show that the reservoir site itself was originally an open landscape but after enclosure in 1870 common grazing rights were removed and plantations established, such that by 1898 the whole site was wooded, except the eastern side of Gipsies Plain, The woodland was progressively cleared in the 1950's to leave only The Avenue, Middle Clearing and an area now referred to as Round Wood intact. The latter are single species oak plantations planted before the woodland clearance in about 1950. For ease of reference, information on the site history and ancient woodland indicator species found for each of the four woodland blocks at the site has been collated into a summary table (**Appendix C2**).

The watercourses crossing the site, including those lying within The Avenue and Middle Clearing are also mostly wooded, being dominated by willow, birch, and locally alder. Within the open grassland the watercourses mostly support lines of young grey willow *Salix cinerea* trees / scrub or occasionally alder and other species which have grown out of the banks. Although these form a fairly continuous linear canopy (varying from a few metres to more than 10m wide) they overlie the grassland and marsh vegetation and do not form distinct areas of wet woodland, except very locally along watercourse S2.

The broadleaved secondary woodland and the mature plantations within Havant Thicket woodland are mostly referable to NVC type W10a, the typical type of oak woodland on neutral to acidic soils, characterised by a hazel *Corylus avellana* and holly *Ilex aquifolium* understorey and the presence of bracken, bramble *Rubus fruticosus* aggregate and honeysuckle *Lonicera periclymenum*. Bluebell is also a typical associate, but it is largely absent from the site, except locally in area W7 and near to Upper Lake in W1. Damper, denser stands support W10c, where there is ground layer of ivy. On more strongly acidic soils some of the woodland is closer to W16a, characterised by the near absence of hazel and the presence of rowan *Sorbus aucuparia* and acidic field layer species, especially wavy hair-grass *Deschampsia flexuosa* and hairy wood-rush. The oak plantations in Middle Clearing and Round Wood have a field layer of grasses and sedges, typical of W10d.

There are small stands of wetter woodland associated with the watercourses in the southern part of Havant Thicket (W8 and W9) and in the middle of The Avenue, west side, north of watercourse S6. Here there are a few ash and alder below the canopy which is still mainly dominated by oak. These areas have a rich field layer and are probably referable to W8c (a type of ash-maple wood on wet soils) or W8d. The area within The Avenue may also be partly intermediate to W7c. Some of the wetter downy birch-dominated woodland within Havant Thicket (e.g. H3, W13) and also found Upper Lake has an affinity to W4 but that next to Upper Lake is drying out and is intermediate to W10c (and is included with that on the vegetation map).

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W1

The Avenue is a strip of semi-natural, broadleaved woodland about 80 metres wide and 850 metres long (**Figure 29** and **Figure 30**). It was not planted as an avenue, but instead is what remains of an oak plantation. A species list for W1 is presented in **Table C8**. There is a small watercourse running south from Upper Lake at the northern end, which exits along the western boundary. Three small watercourses also cut across (these all converge within the grassland to the west). There is some structural diversity and a significant number of AWVPs present (recorded over six survey visits) at low frequency with 26 out of 36 indicators recorded as rare. As with the remainder of the site, no veteran trees are present. Some parts have been historically managed as coppice-with-standards and the wood is largely unmodified apart from several old Corsican pine in the vicinity of the lake.

A track runs north/south through the centre; management was undertaken prior to the 2009 survey to coppice and cut back scrub either side of this to restore the former wider ride. In 2018 the margins of the woodland had been cut back to facilitate the replacement of the fence and the brash piles left in lines along the adjacent grassland.

The woodland canopy is largely composed of middle-aged to mature standards of pedunculate oak, which are quite dense in places, especially to the south of Upper Lake. There is also frequent birch, occasional ash, beech and yew *Taxus baccata*. There is an understorey of hazel with occasional holly, hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa* and rare field maple. The field layer is not strongly acidic, except at the northern end around the lake, being dominated by mixtures of bramble, bracken, ivy and honeysuckle, with occasional buckler-ferns *Dryopteris* species.

Throughout most of the wood the tree and shrub layer is densely shading and the ground flora in these areas is not well developed or particularly rich in species. However, the edges of the main track are a little richer, with frequent false brome *Brachypodium sylvaticum*, wood spurge *Euphorbia amygdaloides*, yellow pimpernel *Lysimachia nemorum* and bugle; with other notable/noteworthy species including tutsan *Hypericum androsaemum*, goldenrod and wood-sorrel *Oxalis acetosella*. Other typical woodland shade herbs frequent along the ride include greater stitchwort *Stellaria holostea*, enchanter's-nightshade *Circaea lutetiana*, wood avens *Geum urbanum* and ground-ivy *Glechoma hederacea*. Other parts of the wood support rare but locally frequent wood anemone and bluebell, the latter only occurring in a patch near the fringe of the wood to the west of Upper Lake. Betony *Betonica officinalis* occurs in a single location on the west margin (SU 7152 0984). Woodland grasses are well represented, with hairy brome *Bromopsis ramosa*, giant fescue *Schedonorus giganteus*, creeping soft-grass, wood melick *Melica uniflora* and wood millet *Milium effusum* recorded.

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The small streams have heavily shaded banks which only support locally frequent remote sedge. There is an area of wet ground (approximately 35 metres x 15 metres) north of the southernmost stream (S6) on the west side of the track, where there is a stand of alder over a field layer of pendulous sedge *Carex pendula*, remote sedge and wood sedge *Carex sylvatica*. Nearby there is a small area of species rich vegetation, probably associated with local base enrichment. This supports patches of common sedge *Carex nigra*, with bugle, lesser celandine *Ranunculus ficaria* and early dog-violet *Viola reichenbachiana*.

Upper Lake (**Map C6**) consists of a dammed pond with birch and willow carr around the margins, which has grown up where the lake has historically dried out. White water-lily *Nymphaea alba* is locally dominant at the southern end of the lake where there is a small area of standing water remaining; there are also small stands of bulrush *Typha latifolia* and branched bur-reed *Sparganium erectum* in this area (this vegetation is mapped under 'species poor marsh and wetland vegetation' on the vegetation map). In 2018 the dry weather had caused the lake to recede to an even smaller area; however, a large amount of scrub had been cut back from the eastern side, leaving large areas of bare mud which quickly became vegetated with a dense sward of Floating Club-rush *Eleogiton fluitans* and remote sedge with bulbous rush *Juncus bulbosus* and grasses. During a visit in July 2019 this vegetation had extended across the middle part of the northern end of the lake, covering an area of approximately 22 x 8 metres. The eastern margin also supports a small patch of marsh St John's-wort *Hypericum elodes*, some *Sphagnum denticulatum* and some species rich marshy vegetation with soft rush (abundant), marsh thistle, marsh pennywort *Hydrocotyle vulgaris*, common marsh-bedstraw, gypsywort *Lycopus europaeus*, water mint, common spike-rush *Eleocharis palustris*, lesser spearwort and yellow pimpernel. Creeping forget-me-not *Myosotis secunda* also appeared in this area in 2018; common yellow-sedge was recorded in 2019.

NVC: W10a, W10c; W8d, W7c; W4, MG10a, M23a, M29-M23a.

Figure 29: W1/T17 9th May 2018

Figure 30: W1 9th May 2018

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Table C8: Species list for the Avenue (W1) including Upper Lake[11]

Species	English name	AWVP	DAFOR
Ferns			
Athyrium filix-femina	Lady-fern		O
Dryopteris affinis	Scaly male-fern	Y	R
Dryopteris carthusiana	Narrow buckler-fern	Y	R/LF
Dryopteris dilatata	Broad buckler-fern		R
Dryopteris filix-mas	Male-fern		R
Pteridium aquilinum	Bracken		F
Grasses, rushes and sedges			
Agrostis capillaris	Common bent		LF
Agrostis stolonifera	Creeping bent		F
Anthoxanthum odoratum	Sweet vernal-grass		P
Brachypodium sylvaticum	False brome		O
Bromopsis ramosa	Hairy-brome	Y	R
Carex nigra	Common sedge		LA
Carex pendula	Pendulous sedge	Y	LA
Carex remota	Remote sedge	Y	LF
Carex sylvatica	Wood sedge	Y	R
Dactylis glomerata	Cock's-foot		O
Deschampsia cespitosa	Tufted hair-grass		F
Eleocharis palustris	Common spike-rush		R
Eleogiton fluitans	Floating Club-rush		LA
Glyceria fluitans	Floating sweet-grass		LF
Holcus lanatus	Yorkshire-fog		O
Holcus mollis	Creeping soft-grass	Y	R
Juncus bufonius aggregate	Toad rush		R
Juncus bulbosus	Bulbous rush		LF
Juncus effusus	Soft rush		O
Luzula forsteri	Southern wood-rush	Y	R
Luzula pilosa	Hairy wood-rush	Y	R
Melica uniflora	Wood melick	Y	O/LA
Milium effusum	Wood millet	Y	R
Molinia caerulea	Purple moor-grass		R
Poa trivialis	Rough meadow-grass		O
Schedonorus giganteus	Giant fescue	Y	R
Herbs			
Ajuga reptans	Bugle		LA
Anemone nemorosa	Wood anemone	Y	LF
Betonica officinalis	Betony	Y	R
Cardamine flexuosa	Wavy bitter-cress		R
Circaea lutetiana	Enchanter's-nightshade		F
Cirsium palustre	Marsh thistle		R
Digitalis purpurea	Foxglove		O

[11] Survey dates: 16 August and 8 September 2006, 18 October 2008, 28 April and 14 May 2009, 9 May 2018.

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Species	English name	AWVP	DAFOR
Euphorbia amygdaloides	Wood spurge	Y	F
Galium palustre	Common marsh-bedstraw		R
Geranium robertianum	Herb-Robert		R
Geum urbanum	Wood avens		R
Glechoma hederacea	Ground-ivy		LF
Hyacinthoides non-scripta	Bluebell	Y	R/LF
Hydrocotyle vulgaris	Marsh pennywort		R
Hypericum androsaemum	Tutsan	Y	R
Hypericum elodes	Marsh St John's-wort		R
Hypericum perforatum	Perforate St John's-wort		R
Hypericum pulchrum	Slender St John's-wort	Y	R
Lamiastrum galeobdolon	Yellow archangel	Y	R
Lycopus europaeus	Gypsywort		R
Lysimachia nemorum	Yellow pimpernel	Y	LF
Mentha aquatica	Water mint		R
Myosotis secunda	Creeping forget-me-not		R
Oxalis acetosella	Wood sorrel	Y	R
Persicaria hydropiper	Water-pepper		R/LF
Potentilla sterilis	Barren strawberry	Y	R
Primula vulgaris	Primrose	Y	R
Ranunculus ficaria	Lesser celandine		O/LA
Ranunculus flammula	Lesser spearwort		O
Ranunculus repens	Creeping buttercup		F
Rumex sanguineus	Wood dock		O
Sanicula europaea	Sanicle	Y	R
Scrophularia nodosa	Common figwort		R
Solidago virgaurea	Goldenrod	Y	R
Sparganium erectum	Branched bur-reed		R
Stachys sylvatica	Hedge woundwort		R
Stellaria holostea	Greater stitchwort		LF
Tamus communis	Black bryony	Y	R
Taraxacum aggregate	Dandelion		R
Teucrium scorodonia	Wood sage		O
Typha latifolia	Bulrush		R
Veronica chamaedrys	Germander speedwell		R
Veronica montana	Wood speedwell	Y	R
Vicia sepium	Bush vetch	Y	R
Viola reichenbachiana	Early dog-violet	Y	R
Viola riviniana	Common dog-violet		R
Trees and shrubs			
Acer campestre	Field maple	Y	R
Betula pendula	Silver birch		R
Betula pubescens	Downy birch		LD
Castanea sativa	Sweet-chestnut		R
Corylus avellana	Hazel		O

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Species	English name	AWVP	DAFOR
Crataegus monogyna	Hawthorn		O
Fagus sylvatica	Beech		O
Fraxinus excelsior	Ash		O
Frangula alnus	Alder-buckthorn	Y	R
Hedera helix	Ivy		A
Ilex aquifolium	Holly	Y	O
Ligustrum vulgare	Wild privet		R
Lonicera periclymenum	Honeysuckle		A
Pinus nigra	Corsican pine		O
Populus tremula	Aspen	Y	R
Prunus spinosa	Blackthorn		R
Quercus cerris	Turkey oak		R
Quercus robur	Pedunculate oak		F
Ribes rubrum	Red Currant	Y	R
Rosa arvensis	Field rose	Y	F
Rosa species	Rose species		P
Rosa stylosa	Short-styled field-rose		R
Rubus fruticosus aggregate	Bramble		A
Ruscus aculeatus	Butcher's-broom	Y	R
Salix cinerea	Grey willow		LD
Taxus baccata	Yew		O
Tilia x europaea	Lime		P
Viburnum opulus	Guelder-rose	Y	R
Total AWVP		**37**	

W2

Middle Clearing is a rectangular single species plantation of semi-mature pedunculate oak planted in around 1950, with a sparse shrub layer and grassy, species poor field layer. A stream enters at the north-west corner, runs along part of the western boundary, and then meanders through the southern half of the wood, exiting at the south-east boundary. A species list for Middle Clearing is shown in **Table C9**. There is also an old boundary bank along at least part of the western edge of the wood. Soils are poorly-draining in the southern half of the wood. During previous surveys cattle had access to the wood and had poached some of the wet areas; but there was no grazing in 2018.

The oaks are densely planted, semi-mature (roughly 30-40 centimetres. Diameter at Breast Height (DBH) and produce heavy shade over much of the wood. There is a sparse shrub layer of hazel and hawthorn with occasional holly. The field layer is largely species poor, being dominated by grasses, especially rough meadow-grass and floating sweet-grass, with abundant remote sedge and wood sedge and occasional soft rush. Similar vegetation occurs in the stream channel, where it is shaded under trees. Some ancient woodland herbs and other species occur underneath the trees, notably

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southern wood-rush *Luzula forsteri* (in at least two places), slender St John's-wort, bitter-vetch and primrose. Wood Anemone and bush vetch *Vicia sepium* occur on the boundary bank near the north-west corner. Nearby, a sunny section of this bank also supports some woodland and dry grassland species, including betony, barren strawberry *Potentilla sterilis*, tormentil and heath speedwell.

The stream supports alder, downy birch *Betula pubescens* and grey willow along the banks and on the west side, where it is less shaded, a number of wetland tall herb and marginal species, including marsh thistle, great willowherb *Epilobium hirsutum*, ragged-robin, gypsywort, water figwort, brooklime *Veronica beccabunga* and rushes.

NVC: W10d, W7.

Table C9: Species list for Middle Clearing (W2)[12]

Species	English name	AWVP	DAFOR
Grasses, rushes and sedges			
Agrostis capillaris	Common bent		A
Agrostis stolonifera	Creeping bent		F
Anthoxanthum odoratum	Sweet vernal-grass		LA
Brachypodium sylvaticum	False brome		F
Bromopsis ramosa	Hairy-brome	Y	F
Carex flacca	Glaucous sedge		R
Carex remota	Remote sedge	Y	A
Carex sylvatica	Wood sedge	Y	A
Dactylis glomerata	Cock's-foot		O
Deschampsia cespitosa	Tufted hair-grass		O
Glyceria fluitans	Floating sweet-grass		F
Holcus lanatus	Yorkshire-fog		O
Juncus conglomeratus	Compact rush		O
Juncus effusus	Soft rush		LF
Juncus inflexus	Hard rush		R
Luzula campestris	Field wood-rush		R
Luzula forsteri	Southern wood-rush	Y	R
Luzula multiflora	Hairy wood-rush		R
Poa trivialis	Rough meadow-grass		A
Herbs			
Ajuga reptans	Bugle		R
Angelica sylvestris	Wild angelica		R
Anemone nemorosa	Wood anemone	Y	R
Betonica officinalis	Betony	Y	R
Cerastium fontanum	Common mouse-ear		R
Cirsium arvense	Creeping thistle		R
Cirsium palustre	Marsh thistle		O

[12] Survey dates: 20 August 2006, 18 October 2008, 28 May 2009, 9 May 2018

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Species	English name	AWVP	DAFOR
Cirsium vulgare	Spear thistle		R
Epilobium hirsutum	Great willowherb		O
Epilobium species	Willowherb species		P
Euphorbia amygdaloides	Wood spurge	Y	R
Galium palustre	Common marsh-bedstraw		R
Hieracium species	Hawkweed		R
Hypericum pulchrum	Slender St John's-wort	Y	R
Hypochaeris radicata	Cat's-ear		R
Lathyrus linifolius	Bitter-vetch	Y	R
Lychnis flos-cuculi	Ragged-robin		O
Lycopus europaeus	Gypsywort		R/LA
Lysimachia nemorum	Yellow pimpernel	Y	R
Mentha aquatica	Water mint		R
Potentilla erecta	Tormentil		R
Potentilla sterilis	Barren strawberry	Y	R
Primula vulgaris	Primrose	Y	R
Prunella vulgaris	Selfheal		R
Pulicaria dysenterica	Common fleabane		R
Ranunculus acris	Meadow buttercup		R
Rumex obtusifolius	Broad-leaved dock		R
Rumex sanguineus	Wood dock		O
Scrophularia auriculata	Water figwort		R
Scrophularia nodosa	Common figwort		R
Stellaria holostea	Greater stitchwort		R
Taraxacum aggregate	Dandelion		R
Urtica dioica	Common nettle		R
Veronica beccabunga	Brooklime		LF
Veronica chamaedrys	Germander speedwell		O
Veronica officinalis	Heath speedwell		O
Vicia sepium	Bush vetch	Y	R
Viola riviniana/reichenbachiana	Common dog-violet and hybrids		LA
Viola reichenbachiana	Early dog-violet	Y	R
Trees and shrubs			
Alnus glutinosa	Alder		R
Betula pubescens	Downy birch		R
Corylus avellana	Hazel		F
Crataegus monogyna	Hawthorn		F
Fagus sylvatica	Beech		R
Fraxinus excelsior	Ash		R
Ilex aquifolium	Holly	Y	O
Ligustrum vulgare	Wild privet		R
Lonicera periclymenum	Honeysuckle		O
Prunus spinosa	Blackthorn		R
Quercus robur	Pedunculate oak		D

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Species	English name	AWVP	DAFOR
Rosa arvensis	Field rose	Y	O
Rosa canina	Dog rose		R
Rubus fruticosus aggregate	Bramble		O
Salix cinerea	Grey willow		O
Ulex europaeus	Gorse		R
Total AWVP		**16**	

W3

Round Wood is a maturing, densely-spaced single species oak plantation with a sparse shrub layer and very species poor grassy field layer. It is unfenced and was grazed by cattle in 2008, but not in 2018. A species list for Round Wood is shown in **Table C10**.

The oak trees range from 25-50 centimetres DBH and the canopy cover is approximately 80 percent. The shrub layer is composed of sparse holly and hawthorn, with some butcher's-broom *Ruscus aculeatus*. There is a three-metre diameter patch of dwarf gorse on the western margin.

The field layer is dominated by grasses, especially rough meadow-grass, Yorkshire-fog and creeping bent. Herbs include abundant wood dock *Rumex sanguineus* and occasional broad-leaved willowherb *Epilobium montanum*, greater stitchwort and dog-violets *Viola* species, with locally frequent three-nerved sandwort *Moehringia trinervia*. Other woodland indicator species recorded include remote sedge, wood sedge and giant fescue. Despite a number of years survey effort only 7 AWVP have been observed at low density.

NVC: W10d.

Table C10: Species list for Round Wood (W3)[13]

Species	English name	AWVP	DAFOR
Grasses, rushes and sedges			
Agrostis capillaris	Common bent		A
Agrostis stolonifera	Creeping bent		R
Anthoxanthum odoratum	Sweet vernal-grass		O
Carex remota	Remote sedge	Y	O
Carex sylvatica	Wood sedge	Y	R
Cynosurus cristatus	Crested dog's-tail		R
Dactylis glomerata	Cock's-foot		F
Deschampsia cespitosa	Tufted hair-grass		O
Holcus lanatus	Yorkshire-fog		F
Juncus effusus	Soft rush		R
Poa trivialis	Rough meadow-grass		D

[13] Survey dates: 8 September 2006, 18 October 2008, 28 May 2009, 9 May 2018

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Species	English name	AWVP	DAFOR
Schedonorus giganteus	Giant fescue	Y	R
Herbs			
Cardamine flexuosa	Wavy bitter-cress		R
Epilobium montanum	Broad-leaved willowherb		R
Epilobium species	Willowherb species		R
Galium aparine	Cleavers		R
Lapsana communis	Nipplewort		R
Moehringia trinervia	Three-nerved sandwort	Y	R/LF
Ranunculus repens	Creeping buttercup		O
Rumex obtusifolius	Broad-leaved dock		R
Rumex sanguineus	Wood dock		A
Stellaria holostea	Greater stitchwort		F
Stellaria media	Common chickweed		O
Teucrium scorodonia	Wood sage		R
Urtica dioica	Common nettle		R
Veronica chamaedrys	Germander speedwell		R
Viola riviniana/reichenbachiana	Common dog-violet and hybrids		R
Trees and shrubs			
Corylus avellana	Hazel		R
Crataegus monogyna	Hawthorn		O
Hedera helix	Ivy		O
Ilex aquifolium	Holly	Y	F
Lonicera periclymenum	Honeysuckle		R/LF
Quercus robur	Pedunculate oak		D
Rosa arvensis	Field rose	Y	O
Rubus fruticosus aggregate	Bramble		F
Ruscus aculeatus	Butcher's-broom	Y	R
Ulex minor	Dwarf gorse		R
Total AWVP		**7**	

W4

Previously recorded as part of area of SCP by ECOSA in 2009. Only the northern half of the area (as shown on **Map C3**) was revisited in 2018, the remainder of the SCP woodland falls outside of the wider site boundary. It consists of semi-natural oak and birch woodland with hazel understorey and bracken/bramble dominated field layer. A small area of ash-maple woodland with species rich ground flora occurs at the southern end. In 2018, scrub and brash had been cut back along the northern boundary to allow the fence to be replaced and an area had been coppiced on the west side of the base of the Avenue.

The wood has a shallow bank around the northern side. The canopy is strongly dominated by oak, comprising mainly tall and dense middle-aged to mature trees. Birch is also abundant throughout and ash occasional to locally dominant. The shrub layer is

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dominated by hazel or locally by holly, with frequent birch and hawthorn. A variety of other trees and shrubs are occasional or rare, including hornbeam *Carpinus betulus*, beech, sweet chestnut *Castanea sativa*, crab apple *Malus sylvestris*, wild privet, butcher's-broom and guelder-rose. Field rose and blackthorn are locally abundant, especially around parts of the margins.

The field layer is mostly strongly-shaded and species poor over much of the wood. It is dominated by ivy, bramble and bracken, with occasional buckler-ferns, frequent wood sage and rare violets. Some areas are a little more open, with more dominant bracken. The boundary bank supports some ancient woodland indicator species, including soft shield-fern *Polystichum setiferum* and southern wood-rush. In 2018 a patch of common cow-wheat *Melampyrum pratense*, about ten metres across, was found near the northern margin (SU 7159 0925); this species had not previously been recorded over the wider site.

NVC: W10a, W10c, W8b.

W5

An unmanaged scrub line with small trees bordering the southern edge of G11 and adjacent gardens. Mature pedunculate oak are present at the eastern end with a dense understorey of blackthorn and willow *Salix* species with ground flora mainly comprising common nettle and creeping bent. Further west towards W6 pendulate oaks are absent and the feature becomes a wide and bushy relatively wide section of dense scrub with associated blackthorn and hawthorn. The ground flora in the section mainly consists of bramble with a small number of other ruderal species.

NVC: W22

Figure 31: W5 July 2018

W6

Southern section is a planted shelterbelt/screening next to Swanmore Road, forming the western boundary to G11. There are three strips of planted trees, each about 115

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metres long by 20 metres wide and about six metres tall, connected by thinner sections of hawthorn scrub. In 2009 it was recorded that no recent management had been carried out, although there has been some disturbance from people.

Main species are field maple, hazel, ash, pedunculate oak, wayfaring-tree *Viburnum lantana* and non-native red oak *Quercus rubra* and between the two southernmost plantations is a section of older, bushy scrub dominated by hawthorn and blackthorn, with dog rose. These trees produce heavy shade and only support sparse vegetation underneath, including grasses, nettle and occasional woodland shade-tolerant species, including bluebell (which may have been planted), garlic mustard *Alliaria petiolata,* wood avens, herb-Robert and lords-and-ladies. A single less frequently recorded species recorded, giant fescue, was located in W6.

NVC: W21.

W6a

W6a consists of Scout Hut Woodland[14], a block of broadleaved woodland which was last surveyed in 2009. Previously recorded as area SH by ECOSA in 2009. During 2009 this area comprised of a strip of semi-natural woodland and willow scrub about 20 metres wide, which widened out at the southern end to into a triangular area of mature oak, ash and birch dominated woodland. There was a small area of ash-maple woodland with rich ground flora at the southern end of the narrow strip, and further areas near the south-east corner of the main part of W6a.

During 2009, the woodland comprised mature oak trees with heavily-shading canopies and a reduced shrub and field layer beneath. Elsewhere, the field layer was dominated by ivy, bramble and bracken and the shrub layer by dense hazel with occasional holly. Associated species included bluebell and wood sage. A number of old ash and field maple stools occurred within the south-east part of the wood. The field layer here was dominated by ivy, but supported locally abundant wood anemone and lesser celandine. The eastern edge of the narrow strip has a damp ditch with abundant grey willow and frequent goat willow. The adjacent verge to the track is moderately species-rich and shows signs of base enrichment in places, supporting some large patches of glaucous sedge *Carex flacca*. In 2009 it was recorded that no recent management had been carried out. A species list for Scout Hut Woodland from data collected in 2009 is shown in **Table C11**

In 2009, a small area of concrete hard-standing at the southern end of the area marked the site of a former scout hut. This formed a glade in the southern end of the wood,

[14] Part of Cabbagefield Row SINC

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allowing some grassy vegetation and thick bramble to grow. Species noted here or nearby included bluebell, wood anemone, Yorkshire-fog, soft rush and herb-Robert.

Information received from Portsmouth Water[15] during 2019 confirmed that the Scout Hut Woodland has not changed significantly since 2009 and that the previously prepared description is still accurate.

NVC: W10c, W8d, W8b

Table C11: Species list for Scout Hut Woodland (W6a), taken from data collected in 2009[16]

Species	English name	AWVP	DAFOR
Trees and shrubs			
Acer campestre	Field maple	Y	O
Acer pseudoplatanus	Sycamore		P
Betula pubescens	Downy birch		F
Castanea sativa	Sweet-chestnut		P
Corylus avellana	Hazel		A
Crataegus monogyna	Hawthorn		O
Fraxinus excelsior	Ash		F
Hedera helix	Ivy		A
Ilex aquifolium	Holly	Y	O
Lonicera periclymenum	Honeysuckle		F
Pinus nigra	Corsican pine		R
Populus species	Poplar species		R
Prunus spinosa	Blackthorn		LF
Quercus robur	Pedunculate oak		A-D
Rosa arvensis	Field rose	Y	R
Rosa species	Rose species		P
Rubus fruticosus aggregate	Bramble		A
Ruscus aculeatus	Butcher's-broom	Y	LF
Salix caprea	Goat willow		O
Tilia x europaea	Lime		O
Herbs			
Anemone nemorosa	Wood anemone	Y	LA
Cerastium fontanum	Common mouse-ear		R/LF
Circaea lutetiana	Enchanter's-nightshade		R
Euphorbia amygdaloides	Wood spurge	Y	R/LF
Galium aparine	Cleavers		F
Geranium robertianum	Herb-Robert		F
Geum urbanum	Wood avens		O
Hyacinthoides non-scripta	Bluebell	Y	O

[15] Portsmouth Water per comms.
[16] Survey dates: 6th May 2009 and 28th May 2009

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Species	English name	AWVP	DAFOR
Lamiastrum galeobdolon (garden form)	Yellow archangel		R
Moehringia trinervia	Three-nerved sandwort	Y	R
Oxalis acetosella	Wood sorrel	Y	R/LF
Potentilla anserina	Silverweed		R
Potentilla sterilis	Barren strawberry	Y	R
Ranunculus ficaria	Lesser celandine		LF
Ranunculus repens	Creeping buttercup		O/LF
Rumex sanguineus	Wood dock		F
Silene dioica	Red campion		R
Stellaria holostea	Greater stitchwort		F
Tamus communis	Black bryony	Y	R
Taraxacum aggregate	Dandelion		O
Teucrium scorodonia	Wood sage		LF
Urtica dioica	Common nettle		O
Veronica chamaedrys	Germander speedwell		O
Veronica hederifolia	Ivy-leaved speedwell		LF
Veronica montana	Wood speedwell	Y	R
Vicia sepium	Bush vetch	Y	R
Viola reichenbachiana	Early dog-violet	Y	R
Viola riviniana/reichenbachiana	Dog-violet species		P
Grasses, rushes and sedges			
Arrhenatherum elatius	False oat-grass		P
Brachypodium sylvaticum	False brome		O
Carex pendula	Pendulous sedge	Y	LF
Carex remota	Remote sedge	Y	R
Carex sylvatica	Wood sedge	Y	O/LF
Deschampsia cespitosa	Tufted hair-grass		R/LF
Holcus lanatus	Yorkshire-fog		LA
Juncus effusus	Soft rush		O
Juncus inflexus	Hard rush		R
Melica uniflora	Wood melick	Y	R/LA
Ferns			
Dryopteris affinis	Scaly Male-fern	Y	R
Dryopteris dilatata	Broad Buckler-fern		O
Dryopteris filix-mas	Male-fern		O
Pteridium aquilinum	Bracken		F
Total AWVP		**19**	

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W7

Woodland area at the northern tip of Havant Thicket woodland. Previously recorded as part of area HTA by ECOSA in 2009. There is a boundary bank and ditch on the north-west side and a fence along the west side. The remains of a parish boundary bank is present along part of the edge of the FE track in the south-west. An old track is located inside the boundary here, which has largely grown over.

The woodland is dominated by oak or birch with occasional ash and sweet chestnut, particularly towards the west end, where some relic sweet chestnut coppice stools are present. The understorey comprises holly, birch species, yew, ash saplings and occasional hazel. Mature pedunculate oaks and Turkey oaks occur along the boundary bank, with grey willow, birch, yew and sweet chestnut. It is predominantly secondary in nature, with a species poor field layer, but there are patches of bluebell which have probably spread in from the older boundary bank. Small patches of bluebell are present at the northern section of the woodland and southwards from here, with a larger area (c.50 x 20 metres). Wood Spurge occurs on the boundary bank and a patch of wood speedwell was recorded.

The track is damp in places, with pendulous sedge, germander speedwell and herb-Robert recorded near the entrance.

NVC: W10a, W10c.

W8

Previously recorded as part of area HTF by ECOSA in 2009. A small stand of older semi-natural broadleaved woodland associated with a stream. The stream originates within Havant Thicket woodland to the north and continues through the open grassland to the south (as S1 and S7), passing through Middle Clearing and the western side of the site and continuing south.

The woodland has a canopy of ash with some oak and an understorey dominated by hazel with frequent hawthorn. At least one mature field maple and saplings are present. The field layer is characterised by ivy, bramble, bracken and ash saplings with the following also recorded (* = AWVPs):

- Field maple *Acer campestre**
- Bugle *Ajuga reptans*
- False brome *Brachypodium sylvaticum*
- Hairy brome *Bromopsis ramosa**
- Remote sedge *Carex remota**
- Enchanter's nightshade *Circaea lutetiana*
- Tufted hair-grass *Deschampsia cespitosa*

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- Wood spurge *Euphorbia amygdaloides**
- Wild strawberry *Fragaria vesca*
- Soft rush *Juncus effusus*
- Wood melick *Melica uniflora** (abundant over large patches)
- Wood-sorrel *Oxalis acetosella** (abundant)
- Barren strawberry *Potentilla sterilis**
- Butcher's-broom *Ruscus aculeatus**
- Sanicle *Sanicula europaea**
- Wood speedwell *Veronica montana**
- Dog-violet species *Viola* species

NVC: W8; possibly closest to W8c.

W9

Previously recorded as part of area HTG by ECOSA in 2009 (which also includes H3). Only the southern edge of W9 was revisited during 2018. W9 refers to the south-western corner of HTG, where there is a small stream running through an area of semi-natural broadleaved woodland (**Figure C32**). The woodland away from the stream consists of tall mature birch and oak over a hazel understorey. To the north of the area there are old plantations of Douglas fir *Pseudotsuga menziesii* and spruce. The field layer is largely dominated by bracken and honeysuckle with bramble and occasional buckler-ferns.

The stream appears as no more than a small ditch in places. The woodland next to the stream has a canopy of ash and alder (the latter mainly on the east side, extending to the boundary to H3) and an understorey of ash, hazel and hawthorn. The field layer is species rich with frequent woodland grasses and ferns. Species present include 19 species of AWVPs (* = AWVPs):

- Field maple *Acer campestre**
- Bugle *Ajuga reptans*
- Lady fern *Athyrium filix-femina*
- Hard fern *Blechnum spicant**
- False brome *Brachypodium sylvaticum*
- Remote sedge *Carex remota**
- Wood sedge *Carex sylvatica**
- Enchanter's-nightshade *Circaea lutetiana*
- Tufted hair-grass *Deschampsia cespitosa*
- Scaly male-fern *Dryopteris affinis* aggregate*
- Narrow buckler-fern *Dryopteris carthusiana**
- Wood spurge *Euphorbia amygdaloides**

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- Herb-Robert *Geranium robertianum*
- Ground-ivy *Glechoma hederacea*
- Creeping soft-grass *Holcus mollis**
- Tutsan *Hypericum androsaemum**
- Slender St John's-wort *Hypericum pulchrum**
- Yellow pimpernel *Lysimachia nemorum**
- Wood melick *Melica uniflora**
- Wood millet *Milium effusum**
- Three-nerved sandwort *Moehringia trinervia**
- Wood-sorrel *Oxalis acetosella**
- Barren strawberry *Potentilla sterilis**
- Primrose *Primula vulgaris**
- Water figwort *Scrophularia auriculata*
- Hedge woundwort *Stachys sylvatica*
- Greater stitchwort *Stellaria holostea*
- Black bryony *Tamus communis**
- Bush vetch *Vicia sepium**
- Wood speedwell *Veronica montana**
- Dog-violet *Viola* species

Lady fern *Athyrium filix-femina*, tufted hair-grass, bugle, remote sedge and yellow pimpernel are frequent in the wetter, alder dominated area on the east side. The tutsan was at the eastern edge of the mapped area, quite close to the stream within area H3. The vegetation on this side of the area develops into thick birch, but has been mapped as part of W8 due to the presence of the woodland indicator species.

NVC: W8c, W10a, W10c.

Figure C32: W9 9th May 2018

W10

A spruce plantation with field layer of bracken, bramble and honeysuckle, with abundant hairy wood-rush *Luzula pilosa*. The stream is a continuation of the one in H3,

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at this location the stream is steeply embanked and supports some hazel and ferns, including narrow buckler-fern, but the banks are species poor, dominated by ivy and honeysuckle.

NVC: W10a, W10c.

W11

Previously recorded as area HTI by ECOSA in 2009. The Corsican Pine Plantation is a maturing pine plantation which was thinned in approximately five years before the 2018 survey, resulting in a stand of tall, moderately dense pine trees with a field layer dominated by bracken and bramble. It is listed as a Plantation on Ancient Wood Site on the AWI. There is a narrow fringe of semi-natural trees and shrubs along the southern and northern edges (with oak, hawthorn, holly and hazel) and a line of willow bushes and some mature oaks along a ditch and bank marking the western boundary. This bank also extends at least part way along the northern boundary. A small stream cuts through the eastern part of the area, which originates to the north and continues to the south through the open grassland (S3), The Avenue, joining with the other main watercourses.

The pine wood supports a thin understorey of holly, with some oak, birch, beech, hazel, rowan and yew. The field layer also supports hairy wood-rush, pale sedge *Carex pallescens* (a single plant recorded in 2009), honeysuckle, ivy and a variety of ferns, including scaly male-fern and narrow buckler-fern. The stream supports locally frequent lady-fern on the banks and some common water-starwort *Callitriche stagnalis*. Other species in damp areas include marsh thistle, soft rush, floating sweet-grass and bog moss *Sphagnum* species.

The area is moderately rich in Ancient Woodland Vascular Plant species, although many of these are scattered or rare, or occur only in a small triangle of semi-natural woodland at the south-east corner (see below). A total of 16 AWVPs were recorded (**Table C12**). Pale sedge could not be re-found in 2018, but the dense field layer prevented a detailed search, so it may still be present.

Bare and grassy areas in the centre of the wood support occasional wall lettuce *Mycelis muralis*, a species normally associated with woodland on base rich soils.

The south-east corner of the area consists of a small extension of semi-natural woodland with a moderately rich flora. Species recorded here include:

- Dog-violet *Viola* species,
- Bugle *Ajuga reptans*
- Wood-sorrel *Oxalis acetosella*

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- Common sedge *Carex nigra* (several patches near to SU 7183 1017)
- Yellow pimpernel *Lysimachia nemorum*
- Primrose *Primula vulgaris*

NVC: W10a (modified), W8.

Table C12: Species list for Corsican Pine Plantation (W11)[17]

Species	English name	AWVP	DAFOR
Trees and shrubs			
Betula pendula	Silver birch		LF
Betula pubescens	Downy birch		LF
Corylus avellana	Hazel		O
Crataegus monogyna	Hawthorn		R
Fagus sylvatica	Beech		R/LF
Hedera helix	Ivy		O
Ilex aquifolium	Holly	Y	LF
Lonicera periclymenum	Honeysuckle		LF
Pinus nigra	Corsican pine		D
Quercus ilex	Holm oak		R
Quercus robur	Pedunculate oak		R/LF
Rubus fruticosus aggregate	Bramble		A
Salix aurita[18]	Eared willow		R
Salix cinerea	Grey willow		LA
Sorbus aucuparia	Rowan		O
Taxus baccata	Yew		O
Herbs			
Ajuga reptans	Bugle		R
Callitriche stagnalis	Common water-starwort		R
Cirsium palustre	Marsh thistle		R
Digitalis purpurea	Foxglove		O
Galium mollugo	Hedge bedstraw		R
Hieracium species	Hawkweed		P
Hyacinthoides non-scripta	Bluebell	Y	R
Hypericum androsaemum	Tutsan	Y	R
Hypericum pulchrum	Slender St John's-wort	Y	LF
Lamiastrum galeobdolon	Yellow archangel	Y	R
Lysimachia nemorum	Yellow pimpernel	Y	R/LF
Moehringia trinervia	Three-nerved sandwort	Y	R
Mycelis muralis	Wall lettuce		O
Oxalis acetosella	Wood sorrel	Y	LF
Potentilla erecta	Tormentil		R

[17] Survey dates: 8th and 10th May 2009. 30th May 2018
[18] Eared willow - 1 bush along western boundary, SU 7151 1026.

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Species	English name	AWVP	DAFOR
Primula vulgaris	Primrose	Y	R/LF
Scrophularia nodosa	Common figwort		R
Stellaria holostea	Greater stitchwort		R
Taraxacum aggregate	Dandelion		R
Teucrium scorodonia	Wood sage		R
Viola riviniana	Common dog-violet		LF
Viola riviniana/reichenbachiana	Dog-violet species		P
Grasses, rushes and sedges			
Agrostis capillaris	Common bent		LA
Anthoxanthum odoratum	Sweet vernal-grass		R
Carex nigra[19]	Common sedge		R/LF
Carex pallescens[20]	Pale sedge	Y	R
Carex pendula	Pendulous sedge	Y	R
Deschampsia cespitosa	Tufted hair-grass		P
Glyceria fluitans	Floating sweet-grass		R
Juncus effusus	Soft rush		LF
Luzula forsteri	Southern wood-rush	Y	R
Luzula pilosa	Hairy wood-rush	Y	O
Milium effusum	Wood millet	Y	R
Ferns			
Athyrium filix-femina	Lady-fern		LF
Dryopteris affinis	Scaly male-fern	Y	R
Dryopteris carthusiana	Narrow buckler-fern	Y	O
Dryopteris dilatata	Broad buckler-fern		F
Dryopteris filix-mas	Male-fern		P
Pteridium aquilinum	Bracken		A
Total AWVP		**16**	

W12

Plantation of beech on damp to dry soils. Previously recorded as part of area HTJ by ECOSA in 2009 (which also includes H5). Only the southern edge of the area was revisited in 2018.

The beech plantation consists of young to semi-mature trees, but some mature specimens also occur. The understorey includes abundant holly. The ground flora is shaded, so is sparse and species poor. There are small patches of heathy acid grassland below, which support occasional patches of heather and species such as pill sedge (occasional), green-ribbed sedge *Carex binervis*, pale sedge *Carex pallescens* and cup-lichens *Cladonia* species. The mature Corsican pine plantation in the north-eastern part of the area has a well-lit field layer of bramble, bracken and honeysuckle,

[19] Common sedge - small and large patches (a metre or more across) near to SU 7183 1017 at eastern end of wood.
[20] Pale Sedge - 1 plant inside western edge of wood, near to SU 7153 1018.

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growing in large, dense patches. Shrubs include occasional saplings of rowan, alder-buckthorn *Frangula alnus* and aspen; birch is also locally abundant. The stream (see also W11) passes through the area; here it is flanked by patches of soft rush.

NVC: W10a, W10c, W10a-W16a transition.

W13

A dense pine and spruce plantation over strongly acidic soils. Previously recorded as area HTH by ECOSA in 2009. There are several old borrow pits underneath the pines, which have formed small ephemeral ponds. Most of the ground on the banks and between the ponds is dominated by shade tolerant woodland mosses, such as *Thuidium tamariscinum*, with patches of purple moor-grass, ferns, some green-ribbed sedge, scattered heather and occasional herbs, including wood spurge. Devil's-bit scabious occurs along the path to the north-west of the ponds.

The ponds are heavily shaded and are mostly filled with soil and leaf litter. A few support a little vegetation, including common marsh-bedstraw and floating sweet-grass. One has a large patch of bog pondweed *Potamogeton polygonifolius*. *Sphagnum squarrosum* (an uncommon species of acidic carr woodland) is present in some of the ponds, including colonies at SU 7209 1056 and SU 7206 1059. One of the less acidic ponds also contains some fat duckweed *Lemna gibba* and is associated with a stand of willow carr.

NVC: W4c.

W14

Havant Thicket woodland car park and surrounding area; previously recorded as part of area HTK by ECOSA in 2009 (which includes W15). Largely secondary semi-natural woodland with a small conifer plantation at the northern end. Two areas of grassland (G13 and G14) are described in Paragraph 3.3.1. The woodland has not been recently managed apart from the cutting and treatment of one *Rhododendron* bush at the southern edge of the area (recorded during previous survey).

The woodland is dominated by oak and birch with a dense understorey of holly and occasional hazel. The field layer is dominated by bramble and honeysuckle with locally frequent bracken, but is largely species poor, with no noteworthy ancient woodland herbs or grasses recorded.

NVC: W10a.

W15

Woodland to the south-east of the car park; previously recorded as part of area HTK by ECOSA in 2009 (which includes W14). An area of historically modified woodland,

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different from the rest of Havant Thicket woodland. There is an irregular depression, which may have been an old pond, drainage channel or similar feature. The presence of evergreen shrubs suggests past use as a garden or grounds to an estate.

The canopy is dominated by tall regrowth from old birch and sycamore *Acer pseudoplatanus* coppice, with some sweet chestnut, oak and ash. There is a dense shrub layer of *Rhododendron*, cherry laurel *Prunus laurocerasus*, sycamore and holly. The field layer is composed of honeysuckle, bramble and locally frequent nettle, with some bracken and broad buckler-fern. Also red currant and butcher's-broom is present. A small number of other ancient woodland indicator species occur, including wood-sorrel and sanicle *Sanicula europaea*.

NVC: W10c.

3.3.3 Heathland and Birch Scrub

Summary

Due to the forestry operations and lack of grazing management much of this has now largely disappeared or developed into dense stands of downy birch and other trees, or where plantations have been recently cleared by purple moor-grass and bracken.

Indications of the past habitat include the presence of small patches of eared willow *Salix aurita*, heather, cross-leaved heath *Erica tetralix*, dwarf gorse and purple moor-grass around the site (mostly along track edges) and also colonies of bog pondweed and *Sphagnum* mosses in watercourses and ditches, including the pools in W13 and H6. *Sphagnum* has also appeared in the recently cleared grassland by the car park (G14). An important mire species present on the site is marsh St John's-wort which occurs on Upper Lake and along the stream to the north (S2) where it was newly discovered during the 2018 survey.

Other notable/noteworthy wet heath and bog species recorded from the site include bog pimpernel *Anagallis tenella*, chaffweed *Centunculus minimus* (=*Anagallis minima*), star sedge *Carex echinata* and creeping willow *Salix repens* (see **Map C8**). The two *Anagallis* species were found in very small quantity growing together at the edge of a wet ride north of W8 in Havant Thicket woodland during the previous surveys but were not visible in 2018. Star sedge occurs along the boggy watercourse in H3. Creeping willow was previously recorded along a track (T14) near the southern edge of the site but appeared to have disappeared in 2018. Many of the species mentioned are local or rare in Hampshire outside of the New Forest.

Where the heathland has scrubbed over with birch and other trees, it eventually develops into NVC types W4 in wet areas or W10a-W16a transition in dry areas as

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described above. More open areas of heathland and heathy acid grassland within Havant Thicket woodland are mainly dominated by purple moor-grass, sometimes with scattered heather, or with rushes and sedges in wetter areas, especially along track sides, where it is often maintained by regular mowing. The latter type is mainly assignable to M25b.

Natural succession to dense birch scrub has developed in H2 to H5 since the 2009 survey. This has created dense shading over most of the ground resulting in a poorly developed field layer.

H1

An area of damp mainly open ground lying to the north of a small stream located within Bells Copse; previously recorded as part of area C by ECOSA in 2009. To the south of this area Bells Copse continues into a mature pine plantation.

H1 largely consists of bracken and sprawling honeysuckle with some patches of rushy grassland and frequent scrub composed of gorse, downy birch, alder-buckthorn, aspen, grey willow, hazel and guelder-rose. The bracken area is herb poor, but has frequent wood spurge. The grassland areas are species rich, with bugle, wood-rush species, creeping soft-grass, purple moor-grass, tormentil and devil's-bit scabious (e.g. patch at SU 7080 1040).

A line of aspen trees forms the northern boundary mapped as willow scrub on **Map C7**.

NVC: W25b/U20a; M25b.

H2

Previously recorded as part of area HTF by ECOSA in 2009 (which also includes W8). An area of previously cleared woodland (historically likely to have been heathland), which is regenerating as areas of dense, thicket-stage, semi-natural scrub and trees, with small open areas of dense bracken. Only the southern edge of HTF was revisited in 2018.

The woodland in the south is composed of oak and dense thickets of downy birch with a limited understorey of hazel, yew, alder-buckthorn, grey willow and some holly and guelder-rose. There are some stands of young conifers, including spruce and Douglas fir. The field/ground layer is composed of ivy, bracken, buckler-ferns, honeysuckle and hairy wood-rush. In the south-west of the area there are a few woodland herb species, including wood anemone and wood spurge.

NVC: W10a, W10c, W25a.

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H3

Previously recorded as part of area HTG by ECOSA in 2009 (which also includes W9). A strip of birch-dominated scrub and secondary woodland flanking a stream on strongly acidic soils. The woodland is dominated by downy birch with locally frequent grey willow and alder-buckthorn, some rowan and occasional oak saplings in tree guards. The field layer is honeysuckle and bracken with frequent bramble. The stream sides support frequent purple moor-grass and some hard fern *Blechnum spicant*. Star sedge was recorded in several places along the stream by other surveyors. Wet, boggy areas alongside the stream support frequent patches of *Sphagnum* mosses. Other plants recorded include creeping soft-grass and foxglove *Digitalis purpurea*. Under the birch on the west side the uncommon fungus bog beacon *Mitrula paludosa* was recorded along a wet ditch.

H4

Previously recorded as part of area HTH by ECOSA in 2009 (which also includes W13). Not resurveyed in 2018. The area supports some blocks of Scots pine and spruce plantation, regenerating dense thicket stage semi-natural birch woodland, the large areas of open grassland and bracken with scrub and scattered trees recorded in 2009 have largely grown in with birch. The surrounding tracks support generally species rich damp to dry heathy acid grassland and low scrub. Many of the species recorded for this area were only present on the sides of the tracks. Most of the area lies on strongly acidic soils. The plantations and other wooded parts support an understorey of birch and occasional oak, with only rare hazel. There is a species poor field layer dominated by bracken, bramble and ivy. Grey willow is locally frequent in wet areas.

Remaining clearings support bracken and damp to dry rough acid grassland with bramble and birch scrub. The grassland is mesotrophic in parts, being dominated by Yorkshire-fog and common bent, but more acidic and heathy in others, with velvet bent (and possibly also brown bent *Agrostis vinealis*); also with occasional sedges, such as pill sedge and frequent heath bedstraw. Heath ragwort *Senecio sylvaticus* was also recorded.

The adjacent ditch on the western boundary of the area (to north of T6 but not separately noted on **Map C7**), holds some permanent standing water, with a small stand of branched bur-reed and some bog pondweed. The gravel track here supports herb rich mesotrophic grassland including locally frequent common knapweed and the only patches of eyebright *Euphrasia* sp. seen during the previous surveys.

NVC: W4, W16a, M23b, M25b, W15b, U20a.

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H5

Previously recorded as part of area HTJ (which also includes W12). The area has been clear felled and has regenerated as dense, thicket stage birch scrub and developing secondary woodland. Pockets of Corsican pine remain. The birch areas are strongly dominated by downy birch, with some silver birch, grey willow, and occasional oak and holly. Some sweet chestnut coppice also survives. The field layer is fairly sparse, consisting of scattered bramble, ivy, honeysuckle, bracken, with some grasses, rushes and mosses of damp ground.

NVC: W4, W10a (or a transition between these).

H6

A small area of damp acidic willow and birch carr, probably derived from wet heath or mire. The habitat continues into W13. The dominant vegetation is grey willow, downy birch and alder-buckthorn, with rowan also present. The ground layer is dominated by purple moor-grass.

There are at least two ponds occur near the northern end of the area, one of these is next to a picnic area (see G13) and is regularly churned up by dogs. This has a large patch of the invasive non-native aquatic parrot's-feather *Myriophyllum aquaticum* (see **Map C8**), plus yellow iris *Iris pseudacorus*, bog pondweed and branched bur-reed. *Sphagnum squarrosum* was recorded from the other pond at SU 7208 1046.

NVC: W4c.

3.3.4 Streams and Watercourses

Summary

A summary of the vegetation of the wooded stream sections is included under Paragraph 3.3.2 (W1, W2, W8 and W11). In the more open sections on the reservoir site the vegetation in the stream channels is predominantly acidic rush pasture of the type described under grasslands, often with stands of sharp-flowered rush and much richer in associated marshy grassland species. This vegetation largely falls under NVC types MG10a/b where species poor, M23b where soft rush is dominant and particularly dense or M23a where species rich, usually with stands of sharp-flowered rush.

Watercourse S2 supports two patches of vegetation, one strongly shaded by willows, with an affinity to M29 *Hypericum elodes-Potamogeton polygonifolius* soakway. Both these species (marsh St John's-wort and bog pondweed) occur here, together with bog mosses *Sphagnum* species in the shaded area see **Map C8**).

A few of the streams have scattered small stands of emergent plants such as branched bur-reed and common reed, and taller wetland herbs, including meadowsweet

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Filipendula ulmaria, wild angelica *Angelica sylvestris*, water figwort and hemp-agrimony. Smaller water margin species such as fool's-water-cress *Apium nodiflorum* and brooklime are rare over the site. There are also small stands dominated by sweet-grasses *Glyceria* species.

S1

During 2009 this location was recorded as a stream dominated by grey willow, with open sections in the southern half supporting species-rich marsh and wetland vegetation. Other trees include frequent hawthorn and some oak. The area had not changed by 2018. A further survey of the watercourse in July 2019 confirmed that an area of moderately herb rich slightly base rich marsh still occurs near the southern end where dominated by hard rush, with frequent common fleabane, common marsh-bedstraw, water mint and greater bird's-foot-trefoil. There is some bare, poached mud with stands of floating sweet-grass (NVC: MG10b).

S2

The stream line is mainly dominated by grey willow to approximately six metres in height and up to 12m canopy width. The northern half has a drier margin, supporting downy birch, oak, hazel, holly, hawthorn, aspen and a beech tree. There is at least one hybrid grey/eared willow on the west side at SU 7138 1028. There is mostly a lack of ground flora underneath the trees due to heavy shading. At c.45 metres from the northern end the stream widens out into a shallow bowl about 10m diameter. This supports patches of two bog mosses (*Sphagnum palustre* and *Sphagnum denticulatum*) and to the south of this a colony of bog pondweed along a 20m x 3m long section (NVC: affinity to M29), centred on SU 7138 1027.

At the southern end, on the north side of The Avenue, there is a marshy section (approximately eight by three metres) where there is less tree cover, above where the stream is culverted. A small colony of marsh St John's-wort was discovered here during the 2018 survey, an additional site to the long-known colony in Upper Lake. Other notable/noteworthy species here are creeping forget-me-not and lesser skullcap *Scutellaria minor*. This area also supports sharp-flowered rush, soft rush, hard rush, bog pondweed, marsh pennywort, water mint, lesser spearwort, common marsh-bedstraw, tormentil and floating sweet-grass. (NVC: M23a-M29).

S3

A small previously grazed watercourse lying in a gently sloping valley, located between areas G4 and G5. The vegetation has become ranker since the previous survey and grey willow has regenerated along the margins, due to the lack of grazing. The channel supports dense rushes, with particularly frequent sharp-flowered rush; also dense soft rush, compact rush, common fleabane (A), marsh thistle, water mint, tormentil and

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lesser spearwort. Other notable/noteworthy species are marsh pennywort, lesser skullcap (one patch in 2018 but abundant along the northern half of the watercourse in 2019), betony, ragged-robin (several patches at SU 7162 0991) and common marsh-bedstraw.

NVC: M23a/b.

S4

Stream with line of tall, mature grey willow, with some downy birch; also a small hazel recorded and goat willow present near the eastern end. One eared willow was recorded previously. Some gaps with bracken/bramble vegetation and wood sage present. The ditch supports typical marshy vegetation, also with betony, great horsetail and wild angelica. At the western end some scrub had been recently cut back next to The Avenue to facilitate fencing. Soft shield-fern and primrose were recorded on the ditch bank.

NVC: W21, W23a, W25b.

S5

Shallow stream and associated vegetation, which runs along part of the western margin of The Avenue, then flows south-west to meet S6. is the watercourse west of The Avenue is partly lined with a canopy of grey willow and alder, some downy birch, oak, hawthorn, blackthorn and bramble (**Figure 33**). Underneath there is a sparse field layer of remote sedge, false brome, wood avens, primrose and other shade-tolerant woodland herbs. It is associated with adjacent strips of marshy vegetation (at the edge of G10) with a large patch of great horsetail, dense rushes, wild angelica, water mint, water figwort, meadowsweet, cuckooflower, bog stitchwort *Stellaria alsine*, wood dock and hard rush.

NVC: M23a, M23b and other wetland vegetation.

Figure 33: S5 26th June 2018

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S6

Watercourse with grey willow scrub on the banks and marshy vegetation. Main species present are soft rush, sharp-flowered rush, tufted hair-grass, water mint, common fleabane and gypsywort. There is one clump of common reed about half way along. At the junction with S5 there is also a stand of branched bur-reed and additional species meadowsweet, greater willowherb, common marsh-bedstraw and hard rush.

NVC: MG10a/b, M23a.

S7

Watercourse, mainly lined by willows, but with an open section about 40 metres long in the south, supporting species rich marsh and wetland flora. Similar vegetation also occurs in adjacent marshy areas on the west side, within G11, especially at the northern end just south of Middle Clearing. Vegetation in these areas is a species rich mixture of water mint (F), common fleabane, floating sweet-grass, gypsywort, ragged-robin, tufted forget-me-not, soft rush, hard rush, sharp-flowered rush (R), remote sedge, common marsh-bedstraw, fool's-watercress, meadowsweet, lesser spearwort, square-stemmed willowherb *Epilobium tetragonum*, water-pepper *Persicaria hydropiper*, creeping buttercup, wild angelica, brooklime and bittersweet. There is one stand of branched bur-reed.

NVC: MG10a/b, M23a/b, S23.

3.3.5 Tracks, Rides, Tree Lines and Hedgerows

Summary

Most of the main forestry tracks within the Havant Thicket woodland area consist of compacted hoggin, which provides a suitable acidic substrate for semi-natural grassland and other vegetation to develop that is native to the site. Most of the these have a verge, ditch and a strip of longer vegetation at the edge of the adjacent woodland, which has mixtures of dry and wet grassland, bramble, bracken, grey willow and other scrub. Frequent species on the damper verges and ditch sides include common fleabane and hemp-agrimony. In the more acidic parts of the site the tracks support heathland and acid grassland species, especially tormentil, trailing tormentil and dog-violets *Viola* species. Various grassland and other NVC types are represented, especially W25b, a bracken community. Due to the linear nature of the habitat NVC types are not easily determinable so have not been listed for most of the tracks.

There are also a number of tracks and footpaths crossing the site or forming parts of its present boundaries. Vegetation along the ride in The Avenue (T17) is described above in Section 3.3.2(W1). The remaining tracks are associated with linear strips of grassland and many are adjacent to fence and ditch lines which have scattered to

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dense scrub composed of grey willow, gorse, bramble and saplings of oak, with blackthorn and hawthorn in places. The grey willow has been recently managed in places to facilitate replacement of fence lines. The scrub on either side of part of the eastern boundary tracks (T12 and T13) are trimmed into species-poor defunct hedgerows.

T1/T2

T1 and T2 were previously recorded as area HTB by ECOSA during 2009. They comprise a main forestry track with mown grass verges and a linear boundary strip of scrub and trees on the west side (**Figure 34** and **Figure 35**). T1 starts within area W7.

The boundary woodland sits on a gently mounded bank with a ditch visible in places. There are some gaps and unshaded areas which support bracken and acid grassland but these were not large enough to map. The trees are mostly mature oaks, with frequent birch, hazel and occasional to locally frequent Turkey oak, yew, hawthorn, alder-buckthorn, aspen and holly. The field layer and open areas on the banks are characterised by bracken, bramble, honeysuckle, wood sage, sweet vernal-grass and tormentil. Shaded areas are dominated by ivy. Associated field layer species include scaly male-fern *Dryopteris affinis*, creeping soft-grass, wood melick, wavy hair-grass and goldenrod.

The track verges are fairly wide (two to four metres) and are regularly mown, which has encouraged high herb cover. Most of the species present are typical associates of bracken communities (W25 and U20), and include a patch of bluebell near the northern end and abundant tormentil, dog-violets with occasional to locally frequent germander speedwell, slender St John's-wort, goldenrod, trailing tormentil and greater stitchwort. Violets include both common dog-violet and early dog-violet (though many plants are intermediates). Bracken, bramble and wood sage are frequent in the rougher vegetation at the edges of the woodland. Wood anemone is present on the west side of T2.

NVC: W10a, W10c, W10-W16a transition, W25b.

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Figure 34: T1 9th May 2018

Figure 35: T2 5th May 2018

T3

Track between northern end of Bell's Copse (H1) and Blendworth Common. This has narrow strips of vegetation either side and is overgrown in places. It supports several notable/noteworthy heathland and acid grassland species. On the north side it is fenced to the common, and has a strip of bushy aspen. The south side is mainly a line of gorse bushes. Heather is locally frequent at SU 7078 1049. Other species recorded along the track include devil's-bit scabious (LF), sneezewort *Achillea ptarmica* (patch on north side at SU 7080 1044), dog-violet species, tormentil (F), glaucous sedge (R), hairy wood-rush *Luzula multiflora* and heath speedwell (R).

NVC: fragments of various communities.

T4

A main forestry gravel track forming part of the southern boundary of Havant Thicket woodland; occasionally mown (**Figure 36** and **Figure 37**). The boundary of G1 on the south side of the track is a line of scrub with willow, bramble and honeysuckle. Sharp-flowered rush and lesser spearwort were recorded in the associated ditch. On the north side the track is fringed by scrub, bracken and grassland. Bugle, wood sedge and glaucous sedge were recorded.

There is a grassy clearing at the western end, at the junction with T2 and T20. This supports some species poor grassland on the more heavily trampled areas, but it is a little more herb rich farther in. Lesser centaury *Centaurium pulchellum* was recorded in the trampled patches during the present survey (an uncommon species of bare or sparsely vegetated ground, not recorded elsewhere on the site). Other species include crested dog's-tail (A), rough meadow-grass, common bent, spreading meadow-grass *Poa humilis*, black medick, common knapweed, red clover, creeping cinquefoil *Potentilla reptans*, curled dock, wood sedge, ribwort plantain, greater plantain *Plantago major*, common fleabane (LF) and lesser trefoil.

NVC: MG7e, MG6a, MG5a.

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Figure 36: T4 9th May 2018

Figure 37: T4 30th May 2018

T5

Part of main forestry gravel track/ride on southern edge of Havant Thicket woodland, with mown grassy verges and adjacent ditches. This is one of the richer sections of tracks. Common spotted-orchid is locally frequent on both sides; there is a large patch of ragged-robin at SU 7130 1037. Pepper-saxifrage *Silaum silaus* was previously recorded. Other species recorded include barren strawberry, common marsh-bedstraw, wood sedge (F), common fleabane (A), glaucous sedge, great willowherb, hemp-agrimony, wild angelica and creeping soft-grass.

T6

A narrow grass track and footpath at the southern end, fenced to the adjacent grassland (G3). The northern section is surfaced with ditches on both sides. At the northern end on the west side is a bush of eared willow at SU 7152 1036 by a wet ditch (**Figure 39**).

Figure 38: T6 30th May 2018

T7

Unsurfaced dry path to the south of the Corsican Pine Plantation (W11). There is scattered heather and dwarf gorse along the edge by the woodland (**Figure 39**). Shrubs here include alder-buckthorn and aspen. Betony is present on the path. The fence to G5 has some low sprawling bramble, with occasional gorse, broom and small oak trees.

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At the western end there is an extension of the path to the south of G3, linking to the northern end of The Avenue. Here there is a blackthorn scrub line on the north side of the path, with species below including bugle, common knapweed, hedge bedstraw *Galium mollugo* and common sorrel.

Figure 39: T7 9th May 2018

T8

Unsurfaced forestry track, similar to other tracks within Havant Thicket woodland. Tormentil abundant along west side.

T9

Unsurfaced track with a ditch on the south side with a line of grey willow scrub which is occasionally trimmed to a height of about approximately 1.2-1.5 metres tall. Other species include gorse, bramble and bracken, with occasional goat willow, downy birch and oak saplings. There is little herbaceous flora in the ditch due to strong shading.

T10

Forestry gravel track with a broad grassy (regularly mown) verge and ditch on the south side (**Figure 40**). This was not surveyed in detail during 2018 but supports species rich vegetation including bugle, marsh thistle and hard fern.

Figure 40: T10 9th May 2018

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T11

A gravel track with scrub, acid grassland and herbaceous vegetation along the margins (**Figure 41**). It lies between dense blocks of woodland and birch scrub, so is quite strongly shaded. Margins are dominated by grey willow. Early dog-violet during the present survey. Previous records include a small patch of dwarf gorse near to the north-west corner of W14 and occasional green-ribbed sedge.

Figure 41: T11 9th May 2018

T12

A forestry track, narrowing to a gravel footpath in the south (**Figure 42**). The boundary to G5 is a ditch line with grey willow-dominated scrub (similar to T9). To the west of G14 there is a thick band of gorse, birch, willow and bramble scrub.

Further south there is a trimmed species-poor line of scrub on both sides of the path, dominated by bramble with gorse, blackthorn, hawthorn, oak saplings and dog rose. On the eastern side there is a steeply sided ditch next to the path, with dense willow, rhododendron and ivy; also alder buckthorn recorded. At the southern end, next to G6 there is an enriched verge supporting rough grass, nettle and bracken.

Figure 42: T12 30th May 2018

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T13

Gravel track and footpath known as Cedar Drive (**Figure 43** and **Figure 44**). There is a belt of oak trees, with holly, hawthorn, butcher's-broom and occasional woodland herbs on the south side (not mapped as part of the feature) and intermittent bramble and scrub on the north side, bordering G6. It consists of bushes and small trees of oak and hawthorn and a section dominated by grey willow at the western end, which had been recently coppiced. Species on the verge and ditch bank here include common spotted-orchid (six plus flower spikes), bugle, remote sedge, false brome, dog-violet species, common sorrel, meadow buttercup, creeping cinquefoil, water mint and herb-Robert, plus other grasses.

Figure 43: T13 9th May 2018

Figure 44: T13 30th May 2018

T14

A grassy track with ditches and scrub on both sides running north to south through Gipsies Plain (**Figure 45** and **Figure 46**). There was a small patch of creeping willow on the track during previous surveys, but this could not be refound in 2018. Along the southern half there is bushy willow scrub on the east side; the remaining sections have gappy lines of scrub with bracken and bramble. The scrub on both sides had been trimmed back prior to the 2018 survey to facilitate replacement of the fence lines, with some of the willows left as small bushy trees.

The willow scrub appears to consist mainly of the hybrid between eared willow and grey willow, but both parents are probably also present. Other species in the scrub include blackthorn, oak, short-styled field-rose *Rosa stylosa*, gorse, bracken and bramble. Open sections of the ditch bank on the east side support several patches of dwarf gorse and heather.

The track is grassy with some meadow barley recorded previously and other grasses during the present survey, including smooth brome, small cat's-ear *Phleum bertolonii* and soft brome *Bromus hordeaceus*. Also present are common knapweed and patches of hairy sedge, silverweed and trailing tormentil.

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The ditches, particularly along the southern half of the track, support patches of species-rich marshy vegetation. Betony, sneezewort and tormentil are present. Other species include common spotted-orchid, creeping-Jenny *Lysimachia nummularia*, marsh woundwort *Stachys palustris*, wild angelica, cuckooflower, hemlock water-dropwort *Oenanthe crocata*, bugle, sharp-flowered rush, common marsh-bedstraw, water mint, lesser spearwort and greater bird's-foot-trefoil. Also of note are patches of primrose on the shady banks under willows and wood anemone along the northern half of the track.

Figure 45: T14 30th May 2018

Figure 46: T14 30th May 2018

T15

Bridleway track with gorse, bracken and bramble along the north side, which had mostly been cleared prior to the 2018 survey and the fences partly replaced (**Figure C47**). There is a shallow ditch on the north side. The track supports short, semi-improved grassland with abundant crested dog's-tail and locally frequent red clover. Strip of rougher grass on the north side have cock's-foot and creeping thistle. Meadow barley was previously recorded along the track.

Figure C47: T15 30th May 2018

T16

A wire-fenced grassy bridleway track on east side of The Avenue (**Figure 48** and **Figure 49**). The track is damp at the western end, with marsh foxtail present. In 2018

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it supported large patches of lesser spearwort, as did the adjacent grassland in G5. Scattered rushes along the track.

Figure 48: T16 30th May 2018

Figure 49: T16 with lesser spearwort 30th May 2018

T17

Ride within the Avenue (see W1 in Paragraph 3.3.2).

T18 / T19

Bridleway track on west side of The Avenue (**Figure 50** and **Figure 51**). Fenced with wire fences on both sides, which were being replaced in 2018. At the edge of The Avenue it starts in a dip of marshy grassland, but the remainder of the track is largely dry semi-improved grassland. Species along here include red clover, lesser trefoil, meadow buttercup, cat's-ear. Of note, a patch of heath speedwell at SU 7140 0983. There is scattered scrub along the fences of hawthorn, blackthorn, oak and bramble.

Figure 50: T18 30th May 2018

Figure 51: T18 30th May 2018

T20

A gravel track with a wide mown verge on the west side of the site (adjacent to Bell's Copse); with a tree line and shallow ditch on east side (**Figure 52** and **Figure 53**). The verge is herb rich and with high herb and sedge cover, due to the regular mowing, but the northern end becomes rather rank, dominated partly by tall fescue. The tree line is

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a line of bushy grey willow and other shrubs, over a shaded ditch bank flora of ivy and remote sedge. guelder-rose was recorded near the northern end.

The verge is dominated by rough meadow-grass, with locally abundant glaucous sedge, tufted hair-grass and tall fescue. Herbs include locally abundant creeping-Jenny, tormentil and trailing tormentil; others recorded include mixtures of wet grassland and woodland ride species, including square-stemmed St John's-wort, silverweed, hemp-agrimony, hoary ragwort, bugle, common fleabane, soft rush, wood spurge, wood sedge (O-LA), sneezewort (1 plant at SU 7081 1014), common knapweed (R), tormentil (R), greater bird's-foot-trefoil, red clover (O), dog-violet species, meadow vetchling, foxglove and hard rush (O).

Figure 52: T20 30th May 2018

Figure 53: T20 30th May 2018

3.4 Discussion

A list of notable/noteworthy species recorded from the site (including areas not covered by the present survey) is shown in **Table C18** in **Appendix C3**. The table includes all species with national Red List threat status (Stroh, et al., 2014) and other selected species which are rare on the site and also uncommon generally in Hampshire. A small number of species recorded are assessed as county scarce or listed as a Hampshire Biodiversity Action Plan species (Rand, 2017). The location of notable / noteworthy species is shown on **Map C8**.

Many of the nationally threatened and near threatened species are heathland species which have declined in England but are still widespread and abundant or locally common in Hampshire, especially in the New Forest and more locally on the north-east heaths. Most of these are not under conservation threat in the county, but the populations of some are locally important on the site, since heathland habitat is rare in the south-east of the county. Chaffweed, creeping forget-me-not and eared willow are rare outside of the New Forest. There are no S41 plant Species of Principal Importance within the site.

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An overview of the habitats within the site as shown on **Map C7**, and the area of the broad habitat types classified as Priority Habitats (**Map C9**) is presented in **Table C13**. These broad habitat types and their associated classification as Priority Habitats are evaluated further below. It should be noted that within **Table C13** there is a small amount of habitat overlap, for instance where streams are located below willow scrub, which has resulted in 'double counting' of areas.

Table C13: On-site habitats[21] and proportion of those classed as Priority Habitats (see **Map C7** and **Map C9**)

Habitat	Hectares	Priority Habitat	Notes
Broadleaved woodland (including plantation)	16.17	8.36 hectares of Lowland Mixed Deciduous Woodland within The Avenue, Scout Hut Woodland and small area associated with access track	12.54 hectares identified as ANSW on the AWI
Coniferous plantation	3.00	-	6.84 hectares identified as PAWS on the AWI (W11, The Corsican Pine Plantation and areas along the access track, T1/T2)
Dry neutral to acid grassland	52.69	0.00	-
Dry acid grassland and bracken	0.0	n/a	-
Damp to wet grassland and developing rush pasture	86.25	-	
Species poor rush pasture and wetland vegetation	5.15	-	
Species rich marsh and rush pasture	1.25	1.25 hectares Purple Moor Grass and Rush Pasture	-
Made-up tracks with grass verges	1.86	-	-
Willow scrub	1.50	-	-
Other scrub	0.14	-	964 metres x 1.5 metre average width = 1446 metres squared (0.14 hectares)

[21] This table is based on the understanding of the site boundary at the time of the study. This has changed and therefore Chapter 9 on Biodiversity provides information on habitats within the Site.

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Habitat	Hectares	Priority Habitat	Notes
Streams	0.37[22]	-	3,721 metres x one metre average width = 3,721 metres squared (0.37 hectares)
Pond	0.65	-	Upper Lake

Broadleaved Woodland (Including Plantation)

Broadleaved woodland within the site is primarily associated with four of the five woodland blocks: The Avenue, Round Wood, Middle Clearing and Scout Hut Woodland. Smaller areas of broadleaved woodland are present along the boundaries of the site. The total area of broadleaved woodland within the site is 16.17 hectares (9.59% of the total site area, see **Map C7**). Of the on-site broadleaved woodland only The Avenue (6.87 hectares), Scout Hut Woodland (one hectare) and a small area along the access track (0.49 hectares) are considered to be Lowland Mixed Deciduous Woodland Priority Habitat. The form of the woodland at Middle Clearing and Round Wood comprising single species oak plantations results in them not being classified as a Priority Habitat.

The Avenue, Round Wood, Middle Clearing and Scout Hut Woodland are listed as ANSW in the AWI. A detailed assessment of ancient woodland indicator species is included in **Appendix C2**. For the purposes of this report a summary of the results for the four blocks of woodland listed in the AWI as ASNW and PAWS are is presented in **Table C14**. There are three slithers of ANSW/PAWS woodland which also fall within the site boundary, these comprise 0.43 hectares (0.22 hectares ANSW and 0.21 hectares PAWS) on the eastern edge of Bells Copse and 0.28 hectares of PAWS along northern boundary west of Corsican Pine Plantation. The access track is also covered by a combination of ANSW (0.49 hectares) and PAWS (2.78 hectares) hectares, although the majority of this area is a made-up track.

Table C14: Summary of on-site ANSW and PAWS woodland in relation to ancient woodland indicator species (further details in **Appendix C2**)[23]

Woodland Block	Ancient Woodland Indicators	Size (Hectares)	Notable / Noteworthy Species Present	Habitat Description
Middle Clearing	16	2.17	Bitter vetch; southern wood-rush	Middle Clearing is a small rectangular single species plantation (c.1950) of young to semi-mature, pedunculate oak. The oaks are densely spaced and produce heavy shade. There is a sparse shrub layer

[22] Estimated from typical average widths of habitat as detailed in the notes
[23] This table is based on the understanding of the site boundary and design at the time of the study. This has changed and therefore Chapter 9 on Biodiversity provides information on ancient woodland within the Site.

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Woodland Block	Ancient Woodland Indicators	Size (Hectares)	Notable / Noteworthy Species Present	Habitat Description
				and grassy field layer. A stream enters at the north-west corner exiting in the south east. The ground flora is impoverished, ancient woodland indicator herbs are rare.
Round Wood	7	1.99	None	Round wood is a small densely-spaced young to semi-mature single species pedunculate oak plantation (c.1950), with a very sparse shrub layer and grassy field layer. The ground flora is impoverished, ancient woodland indicator herbs are rare.
The Avenue	37	6.68[24]	Bog St. John's wort, southern wood-rush, tutsan, sanicle	A narrow strip of semi-natural, broadleaved woodland. A small watercourse runs south from Upper Lake at the northern end. Three small streams also traverse the strip but the banks are heavily shaded. The canopy is largely composed of middle aged to mature standards of pedunculate oak of similar age (oldest originally planted in about 1870) which are quite closely spaced. The pond margins support rushes and wetland species. Throughout most of the wood the tree and shrub layer is densely shaded and the ground flora is not well developed or rich in species. Where there is greater light penetration there is more diversity in the ground flora, for example along the central track.
Corsican Pine Plantation	16	3.57[25]	Eared willow, pale sedge, tutsan	Maturing Corsican pine plantation (c.1960). Narrow fringe of semi-natural species along the southern and northern edges and a line of willow bushes and mature oak trees along a ditch and bank marking the western boundary and part way along the northern boundary. A minor stream cuts through the east of the area.

[24] 6.68 hectares is taken from total area of ASNW within the area of The Avenue located within the site boundary as measured from Natural England's Ancient Woodland GIS layer. When measured using Ordnance Survey mapping / aerial photography the total area of woodland within The Avenue is calculated to be 6.87 hectares. 6.87 hectares is considered to be a more accurate figure, and this is the hectarage used throughout this report and other EcIA chapters.
[25] 3.57 hectares is taken from total area of ASNW within the area of The Corsican Pine Plantation located within the site boundary as measured from Natural England's Ancient Woodland GIS layer. When measured using Ordnance Survey mapping / aerial photography the total area of woodland within The Corsican Pine Plantation is calculated to be three hectares. Three hectares is considered to be a more accurate figure, and this is the hectarage used throughout this report and other EcIA chapters.

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Woodland Block	Ancient Woodland Indicators	Size (Hectares)	Notable / Noteworthy Species Present	Habitat Description
				The centre of the pine wood is shaded with mostly bramble, bracken and ivy as ground vegetation, but there are some scattered herbs mainly around the perimeter of the block, sections of the stream and in the south east. In the north west corner of the area there is a small beech plantation.
Cabbagefield Row (Scout Hut Woodland)[26]	19	1	None	A narrow strip of mainly mature oak and birch woodland which widens in the south, where there are stands of ash-maple woodland with rich ground flora. A small area of hardstanding associated with a former scout hut is present in the south.

The survey results have demonstrated that Middle Clearing and Round Wood currently consist of semi-mature oak plantation over a species poor field layer. The Avenue has a richer but sparse flora, but assessment of these woods based on their current flora and woodland structure is difficult. Cabbagefield Row has a mature oak structure, relatively sparse ground flora, however there are scattered areas of more open vegetation which have species-rich flora.

A comprehensive search of historic maps and archive information by Portsmouth Water (Portsmouth Water, 2012) has shown that the site is a man-made landscape that has changed significantly through time. Historic maps indicate that woodland did not become established across the proposed reservoir site until the mid-1800s. Prior to enclosure in 1870 the site was part of the 'wastes' of the Manor of Havant. From 1800 the area was leased by the owners of the mansion house at Leigh, but copyholders still had the right to graze animals across the Havant Thicket Reservoir site. As the level of grazing reduced more tree growth occurred, which is likely to have been supplemented by planting undertaken by the new lease holder.

Initially the habitat developed from a largely open landscape (1759 map) to what was most likely a grazed heath / grassland with scattered trees (1791 map), and eventually into wood pasture, with glades, rides and open heathland areas (1867 map). Following enclosure in 1870 the land was fully incorporated into the Leigh Park Estate. The area was planted with oak in compartments. The habitat became a managed woodland for

[26] The area of Cabbagefield Row ANSW within the site boundary covered one hectare, the total area of the Cabbagefield Row ANSW is larger. Within this report the area of Cabbagefield Row within the site boundary is called Scout Hut Woodland to better reflect the terms used in the 2013 ECOSA report, and to differentiate between the woodland area located within the site and that covered by the entire Cabbagefield Row boundary.

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timber, shooting and recreational pursuits. Aerial photographs confirm that most of the site area was cleared of trees prior to 1954. The oaks in Round Wood and Middle Clearing were planted prior to 1954 (Portsmouth Water, 2012).

The site history report was submitted to Natural England by Portsmouth Water in order that they could review the ancient woodland designation of the four on-site woodland blocks (including The Corsican Pine Plantation evaluated below). A Natural England email response from Marian Bryant, Woodland Trees and Forestry Specialist dated 28th April 2017 stated:

"Your map evidence shows that these areas were relatively open heathland pre-early 1800s, which is consistent with wood pasture with an open structure."

Natural England acknowledged that there had not been continuous woodland on the site for 400 years, but indicated that Middle Clearing, Round Wood and The Avenue should remain on the AWI as wood pasture due to their habitat continuity with the Forest of Bere.

Coniferous Plantation

The Corsican Pine Plantation was planted in the early 1960's and is the only area of coniferous woodland within the site, covering an area three hectares (1,78% of site area, **Map C7**). Over the course of the surveys undertaken at the site 16 ancient woodland indicator plants have been recorded, although these were mainly scattered around the peripheral areas of the plantation in low numbers and at low densities. Two indicator species recorded in 2009, eared willow and pale sedge were not recorded during 2018 and it is likely that these species have been lost from The Corsican Pine Plantation (see **Table C14**). This area is listed as PAWS on the AWI although as described under the broadleaved woodland evaluation this woodland is likely to have been planted over heathy / scrub habitat rather than woodland. Therefore, this area is not considered to have had continuous / or near continuous woodland cover since 1600AD, and is therefore unlikely to be ancient woodland. No Red Listed plant species (Stroh, et al., 2014) were recorded from this habitat.

Coniferous woodland is common and widespread in Hampshire and the UK as a whole and therefore The Corsican Pine Plantation is assessed of being low ecological value. The form of the woodland as a single species pine plantation results in it not being classified as a Priority Habitat. The narrow fringing areas of young semi-natural broadleaved trees and shrubs and the small triangle of woodland in the south-east corner has the potential to develop into lowland mixed deciduous woodland. The deciduous trees in the south east and north of the plantation will be retained as they are expected to be above the top water level of the reservoir.

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Dry Neutral to Acid Grassland

This habitat type is widespread across the site covering an area of approximately 52.69 hectares (31.23% of site area, see **Map C7**). In the west of the site the drier grassland is mainly associated with the higher ground, particularly Deerslaughter plain (G11) and the north-west corner of the site (G1). In the east, this habitat type is located on Gipsies Plain (G5, G6 and G7). The majority of this habitat type within the site comprises unremarkable grassland with low species diversity, although there are infrequent areas with moderate species diversity. Away from ditches associated with the dry grassland habitat only a single Red Listed plant species (Stroh, et al., 2014) was recorded, the Near Threatened species heath speedwell (see Error! Reference source not found.). O verall, the dry acid to neutral grassland are not of sufficient quality, or species diversity to be classed as either Lowland Meadow or Lowland Dry Acid Grassland Priority Habitat

Damp to Wet Grassland and Developing Rush Pasture

This habitat type is the most abundant habitat within the site, covering approximately 86.25 hectares (51.13% of site area, see **Map C7**). Typical examples are located in G4 and G8, although the habitat is prevalent in lower lying areas both east and west of The Avenue. Wetter grassland areas tend to be more species and herb rich, but there are also small areas of wet species poor grassland in the west and south of the site. Away from ditches this habitat supports large patches of lesser spearwort (Vulnerable on the England Red List) and occasional ragged robin (Near Threatened) (see Error! R eference source not found.). Overall, the wet grassland and developing rush pasture areas are not of sufficient quality, or species diversity to be classed as Lowland Meadow or other Priority Habitat types.

Species Poor Rush Pasture and Wetland Vegetation

This habitat is infrequent in the lower lying areas of the south of the site, both east and west of The Avenue. The main areas are located in Deerslaughter Plain (G11), east of Middle Clearing (G10) and east of the southern toe of The Avenue (G7). This habitat type covers approximately 5.15 hectares (3.05% of the site area, see **Map C7**). No Red Listed plant species (Stroh, et al., 2014) were recorded from this habitat. The Species Poor Rush Pasture and Wetland Vegetation is not considered to be Purple Moor Grass and Rush Pasture Priority Habitat due to the lack of species diversity and absence of certain characteristic species.

Species Rich Marsh and Rush Pasture

Small pockets of species rich marsh and rush pasture are associated with the wetter ground along watercourses and ditches on site, and in a more substantial block to the east of The Avenue. The species rich marsh areas total 1.25 hectares (0.74% of site area, see **Map C7**). Typical areas where this habitat is found include G7, within Upper Lake and along S2, S4, S5, S6 and S7. Red Listed plant species (Stroh, et al., 2014)

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recorded from these areas include the Near Threatened species ragged-robin and marsh pennywort.

The small pockets of acidic marshy vegetation within Upper Lake and along watercourse S2, relating to NVC habitat M29 *Hypericum elodes-Potamogeton polygonifolius* soakaway vegetation (but intermediate to M23) are of importance since within Hampshire this type of vegetation is very rare outside of the New Forest. The characteristic Near Threatened marsh St John's-wort is present in these areas.

All the areas of species rich marsh and rush pasture conform to the Purple Moor Grass Rush Pasture Priority Habitat.

Made-up Tracks with Grass Verges

The only made-up track with grass verges within the site is associated with the access track. The area covered by this habitat type is 1.86 hectares (1.10% of site area, see **Map C7**). The grassland alongside track T1/T2 contains bracken vegetation associated with some acid grassland and woodland ride species, including bluebell and tormentil. A single Red Listed plant species (Stroh, et al., 2014), the Near Threatened goldenrod, was recorded on the adjacent woodland bank and may also occur in the bracken vegetation. The track and associated bracken are widespread and common habitats in the UK.

Willow scrub

A high proportion of the on-site streams are overshaded by willow scrub, a habitat which covers approximately 1.5 hectares (0.89% of the site area, **Map C7**). Willow scrub is a common and widespread habitat throughout the UK.

Streams

The vegetation along the on-site ephemeral streams is mostly unremarkable comprising mainly rushes with a small variety of herbaceous species. Where the streams pass through woodland a number of AWVPs with a preference for wetter soils have been recorded. The streams do not conform to the rivers and streams Priority Habitat description due to their lack of a diverse aquatic invertebrate fauna (see Chapter L), or a high diversity of plant species.

Other Scrub

Two patches of narrow linear blackthorn scrub are present within the site. These are located along the north-eastern boundary and linking The Avenue to The Corsican Pine Plantation. They are typically between one and two metres in width and have an approximately length of 964 metres within the site (0.14 hectares). This habitat is common and widespread in Hampshire and the UK as a whole.

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Pond

A single pond, Upper Lake, is present within the site, located at the northern end of The Avenue. Within the pond there is a small area of species rich marsh as described in the Species rich marsh and rush pasture above. The County Scarce creeping forget-me-not was recorded from Upper Lake during the 2018 survey. Other species present are typical of standing water habitats, and a there is not a particularly diverse flora. As a result, this feature was considered to be of limited ecological value and is not considered to conform to the 'ponds' Priority Habitat.

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4.0 CONCLUSIONS

4.1 Conclusion

The results of the 2018 survey work indicate that the majority of the site comprises low quality semi-improved neutral grassland. Wetter grassland areas tend to be more species and herb rich, but this is not always the case with wet species poor grassland recorded in the west and south of the site. Three S.41 / Priority Habitats are present within the site: Purple Moor grass and Rush Pasture; Lowland Dry Acid Grassland and Lowland Mixed Deciduous Woodland.

There are three watercourses which enter the north of the site and join together into a single stream towards the southern boundary. The watercourses are very narrow, typically around one metre wide, ephemeral streams which are generally dry from May to October. Most of the watercourses are very shaded by willow scrub. As a result, there is limited riparian vegetation along most of the stream channels. In small more open sections of the watercourses there is some more localised species rich marsh and rush pasture vegetation.

Upper Lake is the only area of standing water within the site, comprising a man-made shallow pond with will scrub and a small area of rush pasture and wetland vegetation.

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Map C1 Site Location Plan

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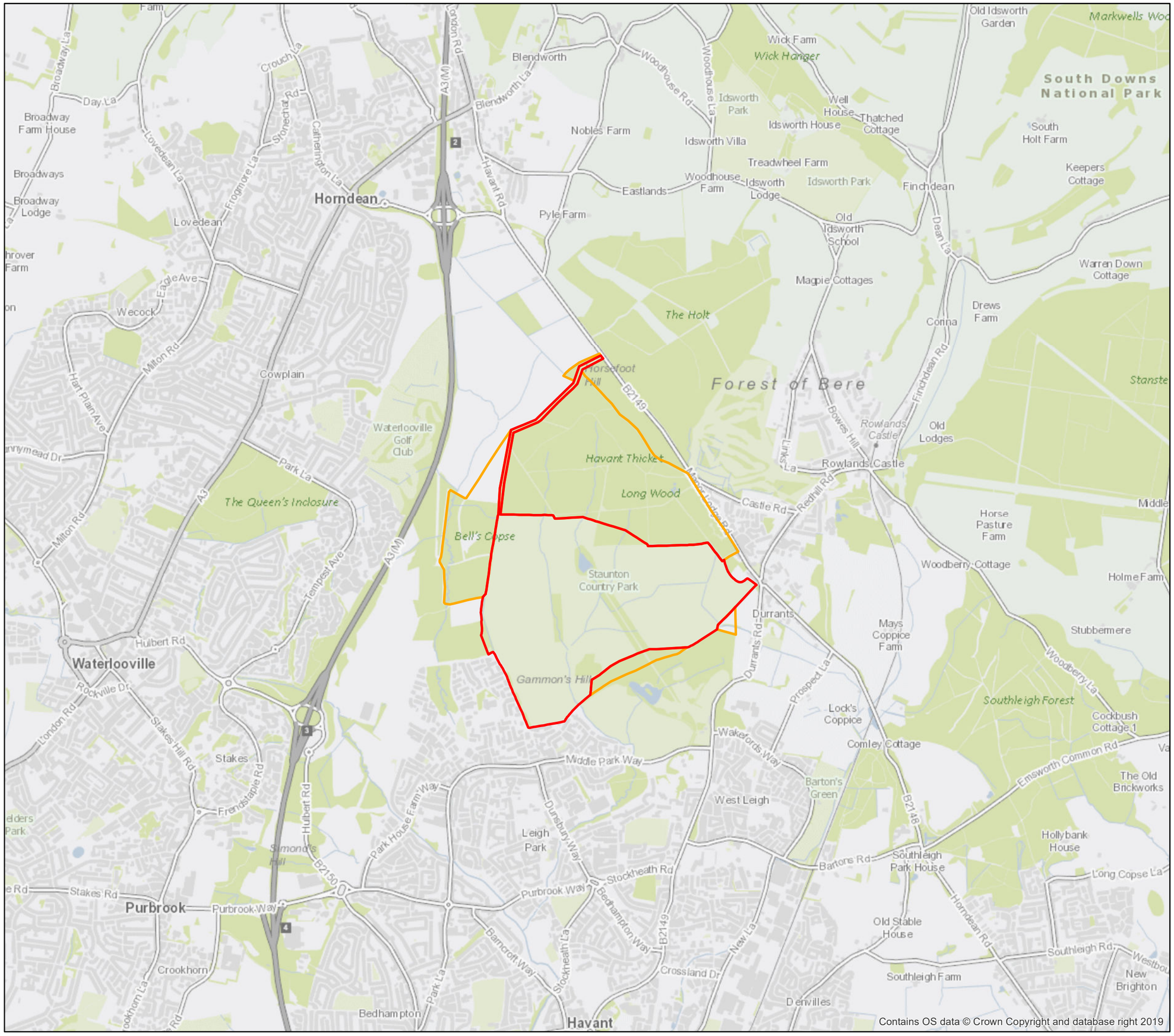

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HAVANT THICKET WINTER STORAGE RESERVOIR

VEGETATION ASSESSMENT

Map C1 - Site Location Plan

Client:	Portsmouth Water
Date:	September 2019
Status:	Final

KEY

Site Boundary (the site)

Ecological Enhancement Area (wider site)

Scale at A3: 1:25,000

0 500 1,000 Metres

N

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Map C2 Key Site Features

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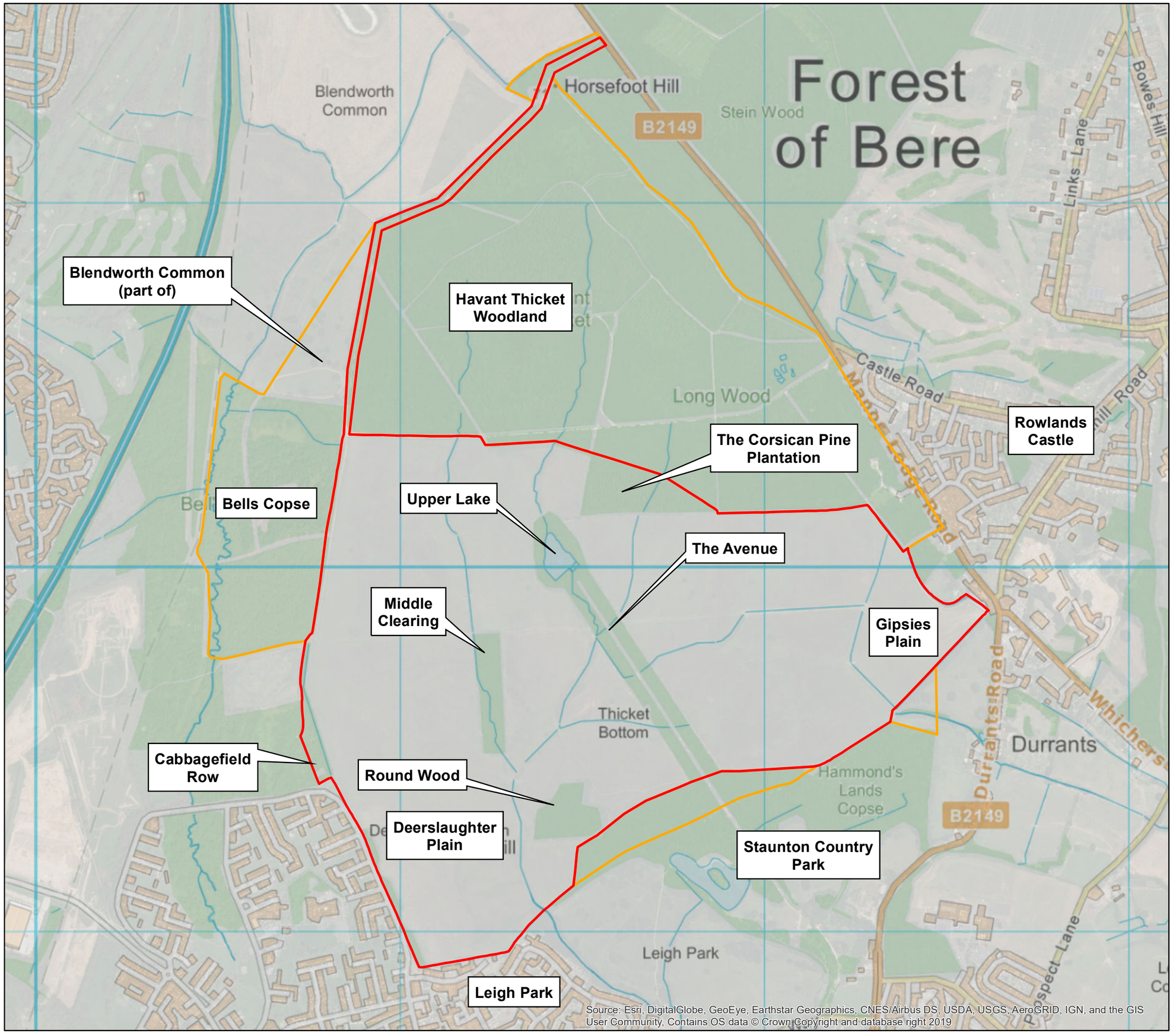

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HAVANT THICKET WINTER STORAGE RESERVOIR

VEGETATION ASSESSMENT

Map C2 - Key Site Features

Client:	Portsmouth Water
Date:	November 2019
Status:	Final

KEY

Site Boundary (the site)

Ecological Enhancement Area (wider site)

Scale at A3: 1:10,000

0 250 500 Metres

N

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Map C3 2018 Survey Area

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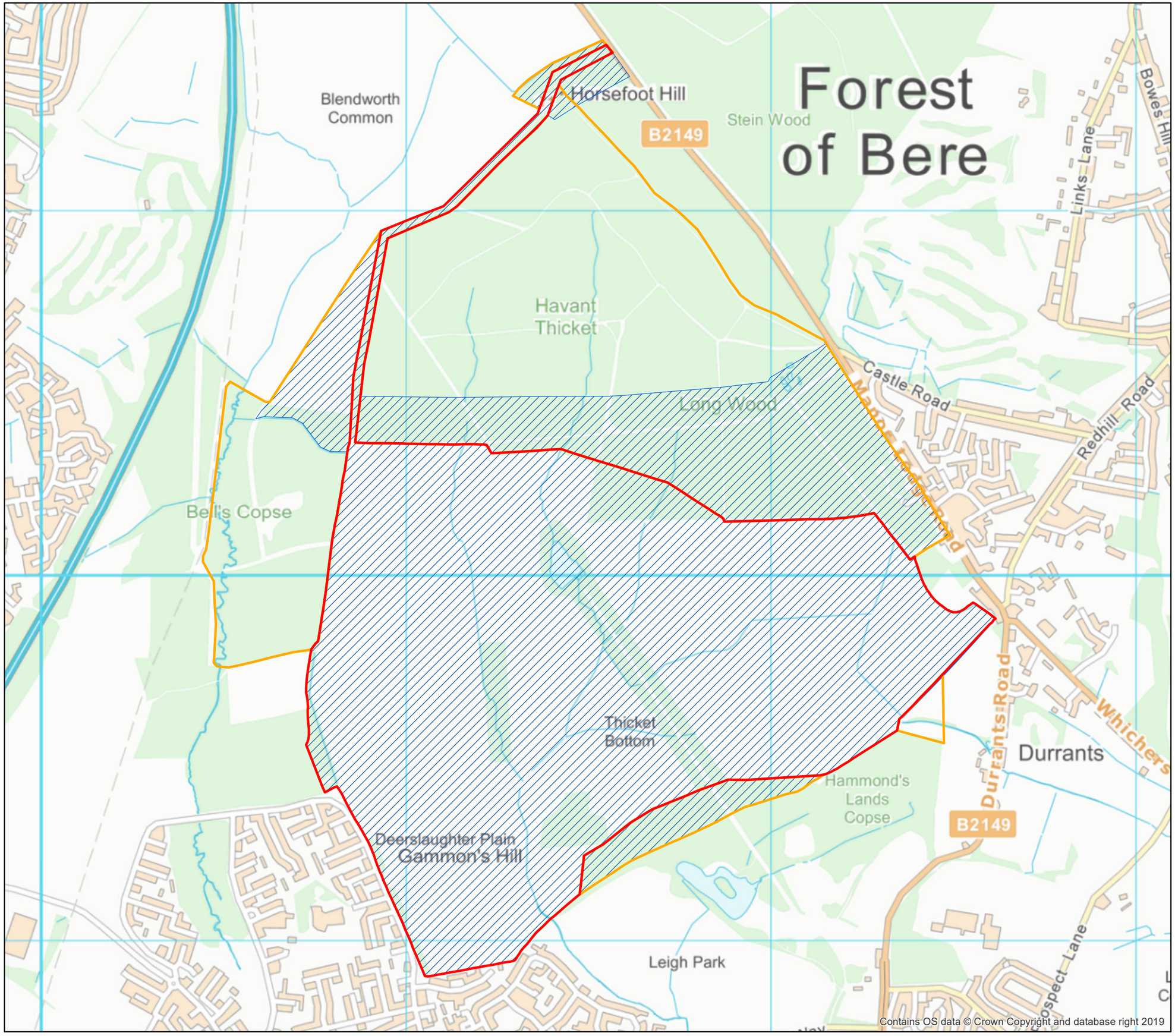

HAVANT THICKET WINTER STORAGE RESERVOIR

VEGETATION ASSESSMENT

Map C3 - 2018 Vegetation Survey Area

Client:	Portsmouth Water
Date:	September 2019
Status:	Final

KEY

- Site Boundary (the site)
- Ecological Enhancement Area (wider site)
- Vegetation Survey Area

Scale at A3: 1:10,000

0 250 500 Metres

N

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Map C4 Vegetation Desktop Study Data – Plant Species Records

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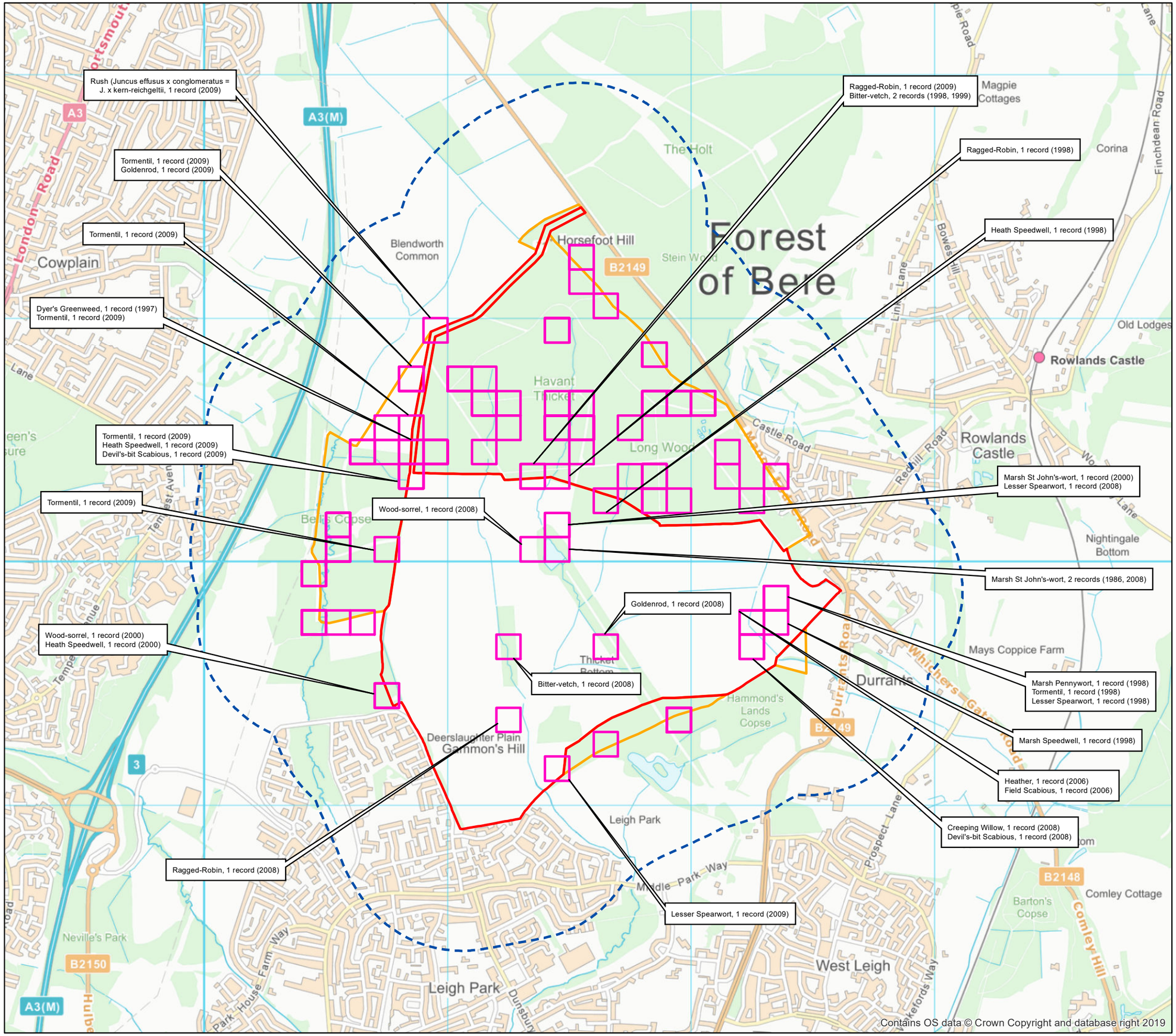

HAVANT THICKET WINTER STORAGE RESERVOIR

VEGETATION ASSESSMENT

Map C4 - Vegetation Desktop Study Data: Plant Species Records

Client:	Portsmouth Water
Date:	September 2019
Status:	Final

KEY

- Site Boundary (the site)
- Ecological Enhancement Area (wider site)
- Desktop Study Search Radius: 500m
- Hampshire Biodiversity Information Centre (HBIC) Vegetation Records

N.B. Hampshire Biodiversity Information Centre (HBIC) records shown on the map are located within 100m x 100m resolution grid squares. Only those records intersecting with the site boundary and the ecological enhancement area boundary have been shown here. Species records intersecting with the site boundary are labelled; species records outside of this are too numerous to label here but are referred to in the report. Boundaries of nearby Local Nature Reserves (LNRs) and Sites of Importance for Nature Conservation (SINCs) are provided in Chapter B Map B4.

Note: This map does not include previous ECOSA survey information collected between 2006 and 2009. The data from these surveys is presented in Appendix C1 and previously recorded notable / noteworthy species are shown on Map C8.

Scale at A3: 1:15,000

0 250 500 Metres

N

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Map C5 Vegetation Desktop Study Data – Priority Habitats

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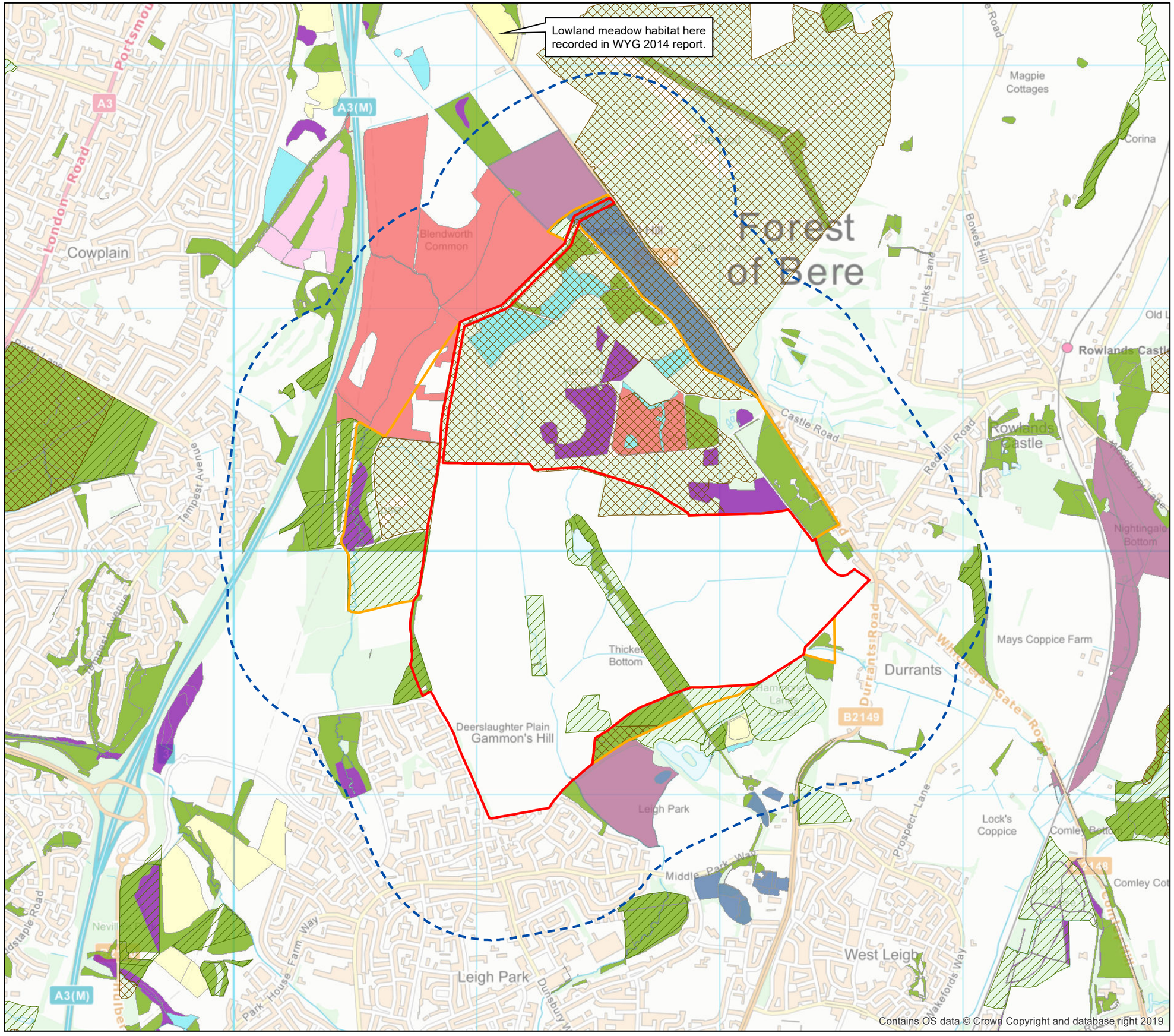

HAVANT THICKET WINTER STORAGE RESERVOIR

VEGETATION ASSESSMENT

Map C5 - Vegetation Desktop Study Data: Priority Habitats

Client:	Portsmouth Water
Date:	September 2019
Status:	Final

KEY

- Site Boundary (the site)
- Ecological Enhancement Area (wider site)
- Desktop Study Search Radius: 500m
- Ancient Semi-natural Woodland
- Plantation on Ancient Woodland Sites

Priority Habitats

- Coastal and Floodplain Grazing Marsh
- Lowland Dry Acid Grassland
- Lowland Heathland
- Lowland Meadows
- Lowland Mixed Deciduous Woodland
- Purple Moor Grass and Rush Pastures
- Wet Woodland
- Wood-Pasture and Parkland

N.B. Boundaries of nearby Local Nature Reserves (LNRs) and Sites of Importance for Nature Conservation (SINCs) are provided in Chapter B Map B4.

Scale at A3: 1:15,000

0 250 500 Metres

N

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Map C6 Target Notes and Broad Vegetation Areas

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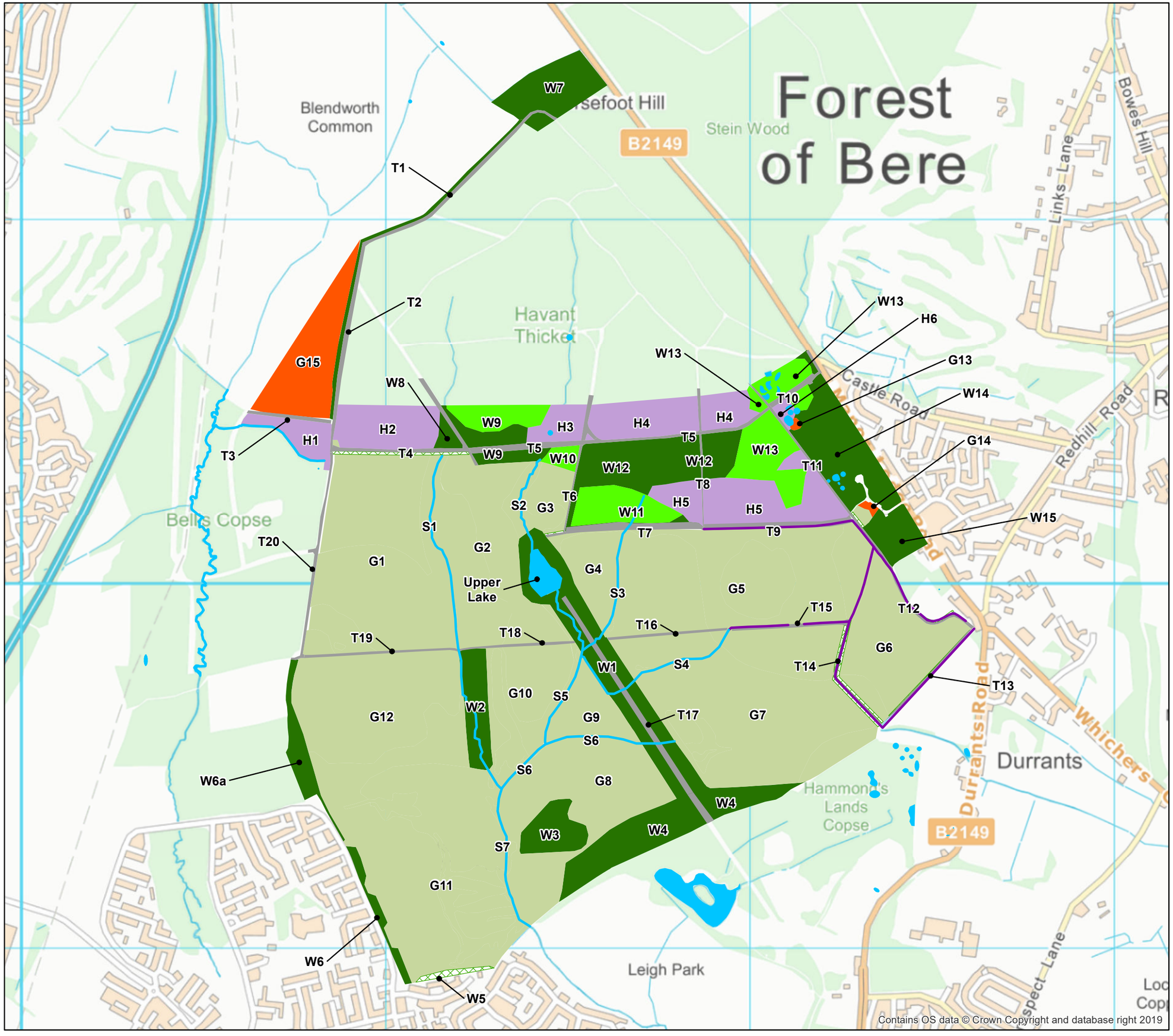

HAVANT THICKET WINTER STORAGE RESERVOIR

VEGETATION ASSESSMENT

Map C6 - Target Notes and Broad Vegetation Areas

Client:	Portsmouth Water
Date:	November 2019
Status:	Final

KEY

- Broadleaved woodland (including plantation)
- Coniferous plantation
- Former heathland developing into scrub and secondary woodland
- Scrub
- Acid grassland
- Neutral grassland
- Watercourses
- Ditches
- Tracks and rides

N.B. Target notes as shown are referenced in report. T1 and T2 consist of a track bounded by acid grassland; however, this grassland habitat is too small to be mapped here and is therefore not shown.

Scale at A3: 1:10,000

0 125 250 500 Metres

N

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Map C7 Vegetation Types

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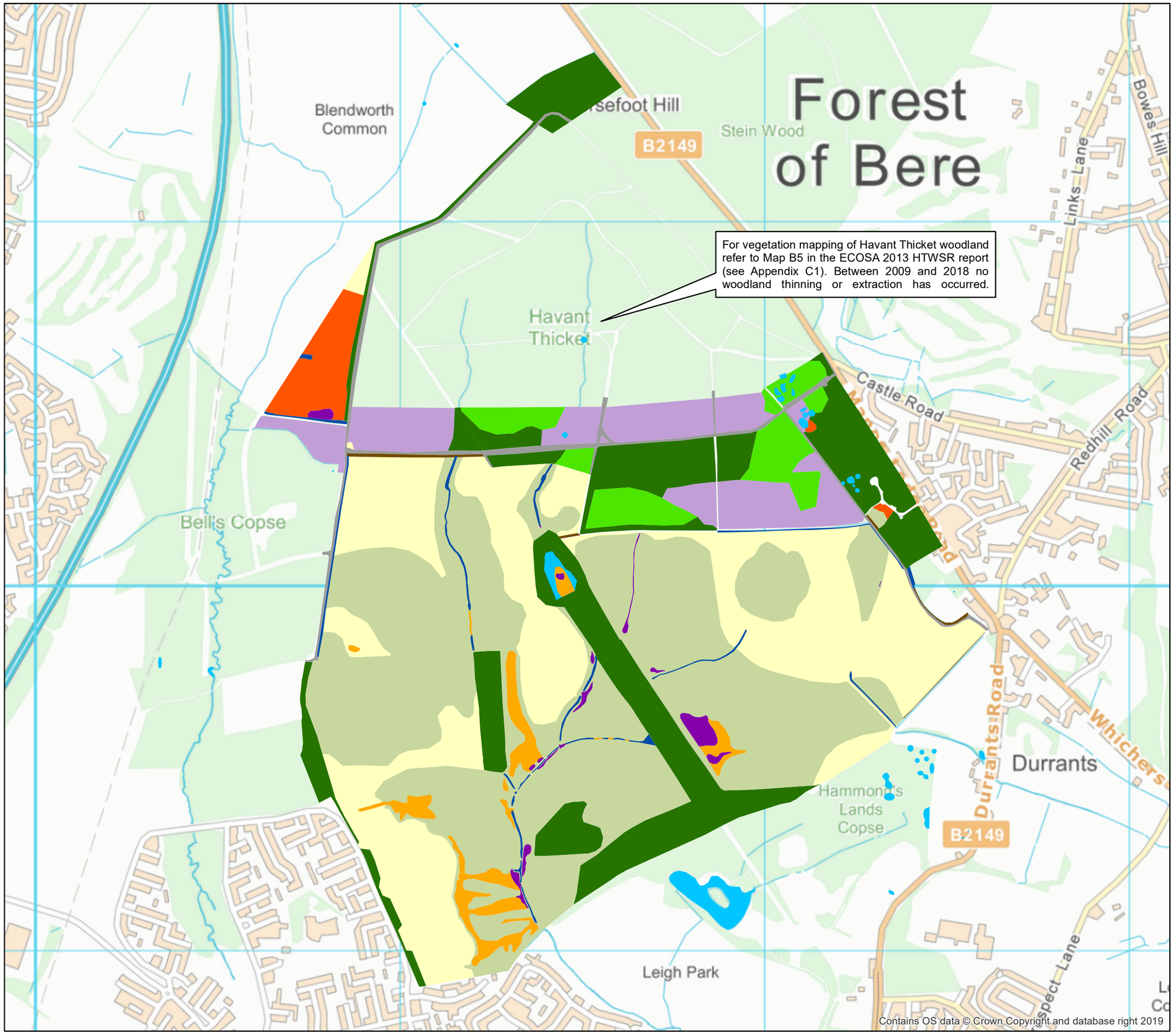

For vegetation mapping of Havant Thicket woodland refer to Map B5 in the ECOSA 2013 HTWSR report (see Appendix C1). Between 2009 and 2018 no woodland thinning or extraction has occurred.

HAVANT THICKET WINTER STORAGE RESERVOIR

VEGETATION ASSESSMENT

Map C7 - Vegetation Types

Client:	Portsmouth Water
Date:	November 2019
Status:	Final

KEY

- Broadleaved Woodland including Plantation
- Coniferous Plantation
- Former Heathland developing into scrub and Secondary Woodland
- Dry Neutral to Acid Grassland
- Dry Acid Grassland and Bracken
- Damp to Wet Grassland and Developing Rush Pasture
- Species Rich Marsh and Rush Pasture
- Species Poor Rush Pasture and Wetland Vegetation
- Made-up Tracks with Grass Verges
- Willow Scrub
- Other Scrub
- Pond

Scale at A3: 1:10,000

0 125 250 500 Metres

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Map C8 Notable Species

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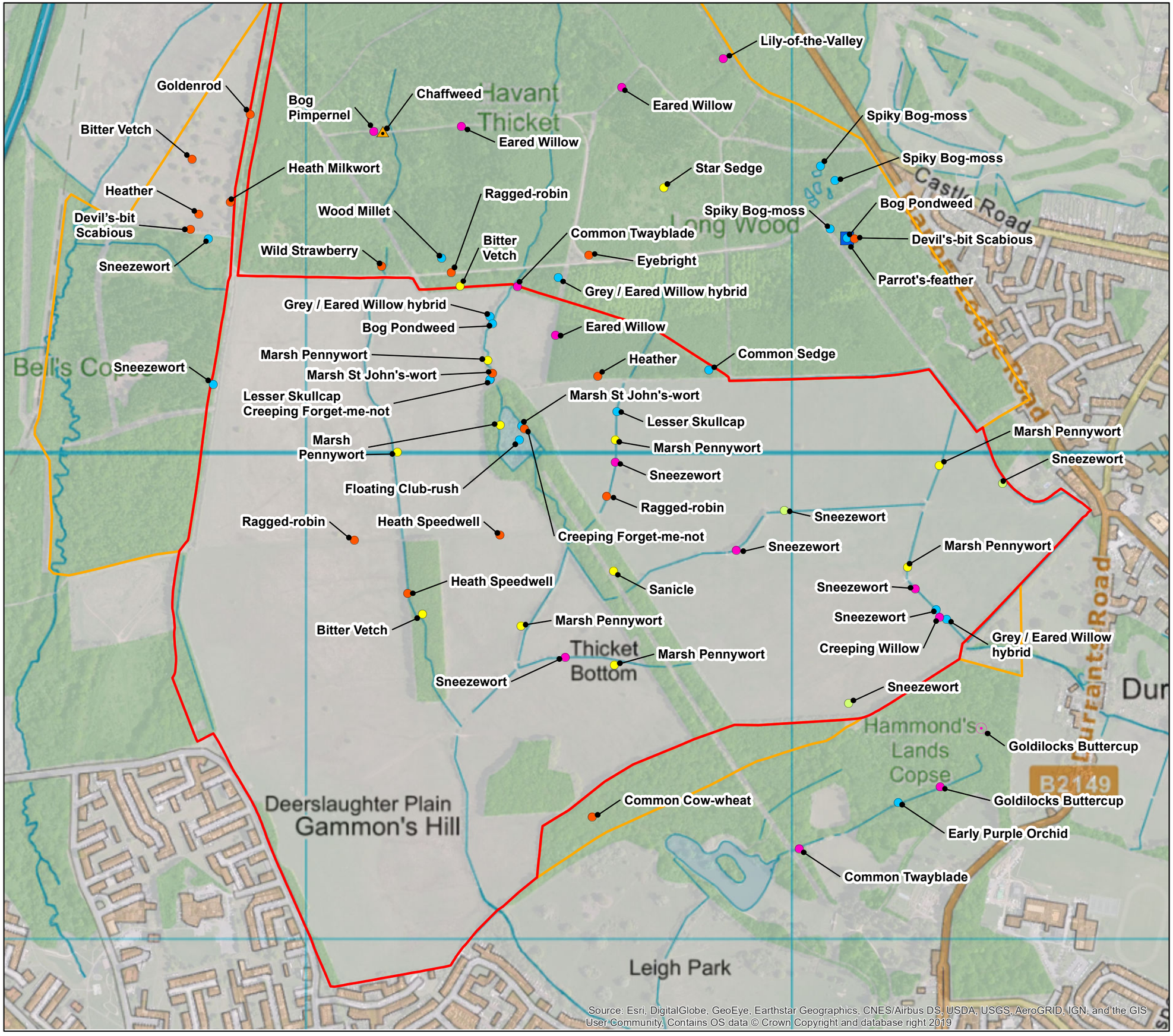

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HAVANT THICKET WINTER STORAGE RESERVOIR

VEGETATION ASSESSMENT

Map C8 - Notable and Noteworthy Species

Client:	Portsmouth Water
Date:	September 2019
Status:	Final

KEY

- Site Boundary (the site)
- Ecological Enhancement Area (wider site)
- Endangered Species (England Red List) Records 2009
- Near Threatened Species (England Red List) Records 2009
- Near Threatened Species (England Red List) Records 2018
- Noteworthy Plant Species Records 2009
- Noteworthy Plant Species Recorded 2009 and 2018
- Noteworthy Plant Species Records 2018
- Noteworthy Plant Species Records 2019
- Schedule 9 Invasive Non-Native Species Records 2018

N.B. This map does not show Lesser Spearwort (England Red List: Vulnerable), which is locally abundant in wet grassland and rush pasture over the site. Noteworthy species marsh corky-fruited water dropwort, lesser pond sedge, trailing tormentil, tutsan, southern woodrush and velvet bent are not particularly uncommon within the survey area and therefore these have been excluded from this map. Wood-sorrel (England Red List: Near Threatened) occurs in W1, W8, W9, W11 and W15 (see Map C6).

Scale at A3: 1:7,500

0 100 200 Metres

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Map C9 Priority Habitats

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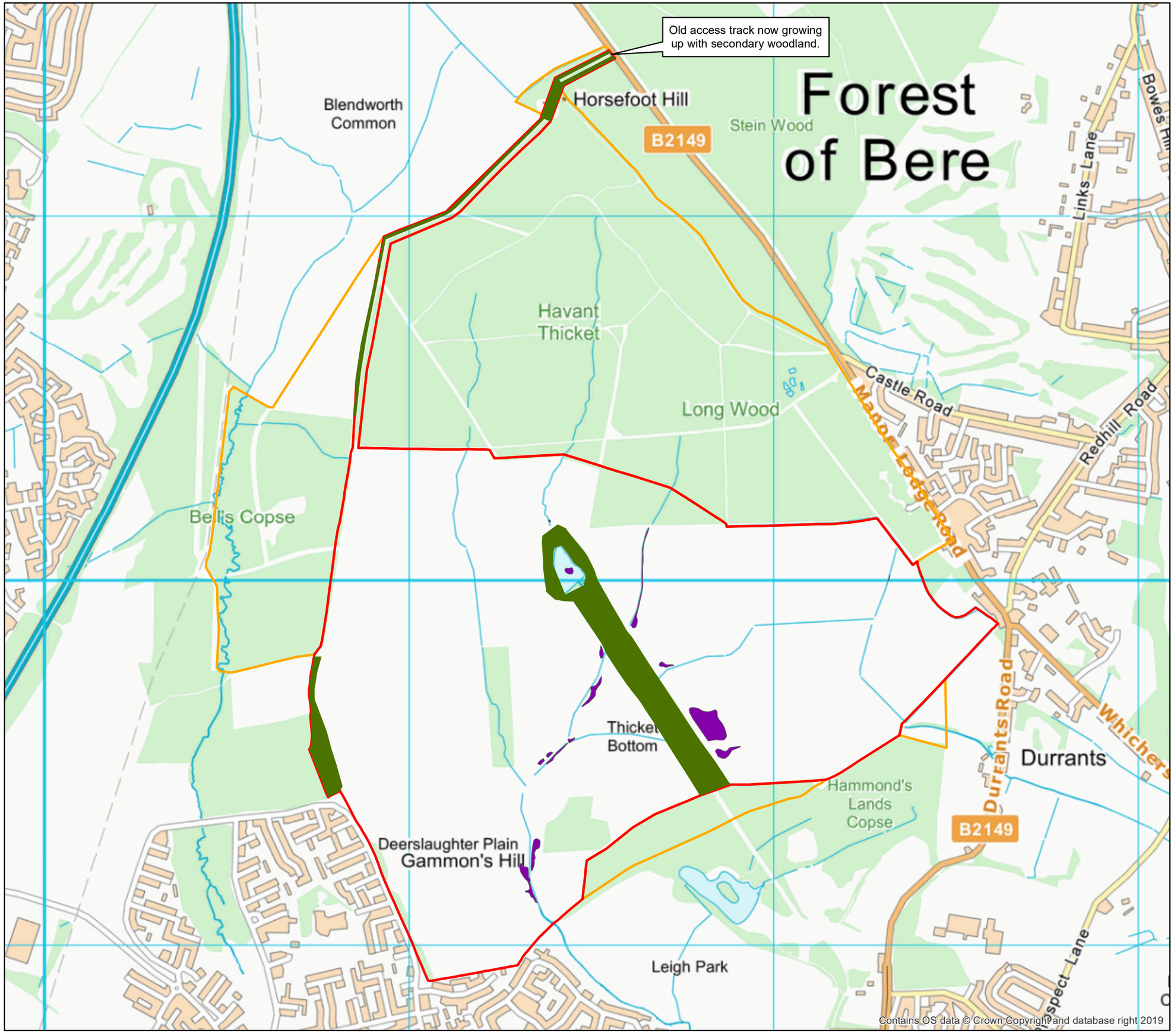

HAVANT THICKET WINTER STORAGE RESERVOIR

VEGETATION ASSESSMENT

Map C9 - Priority Habitats

Client:	Portsmouth Water
Date:	September 2019
Status:	Final

KEY

- Site Boundary (the Site)
- Ecological Enhancement Area (wider site)
- Lowland Mixed Deciduous Woodland
- Purple Moor Grass and Rush Pastures

N.B. Only priority habitats within the site boundary have been mapped.

Scale at A3: 1:10,000

0 125 250 500 Metres

N

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Map C10 Priority Habitat Loss

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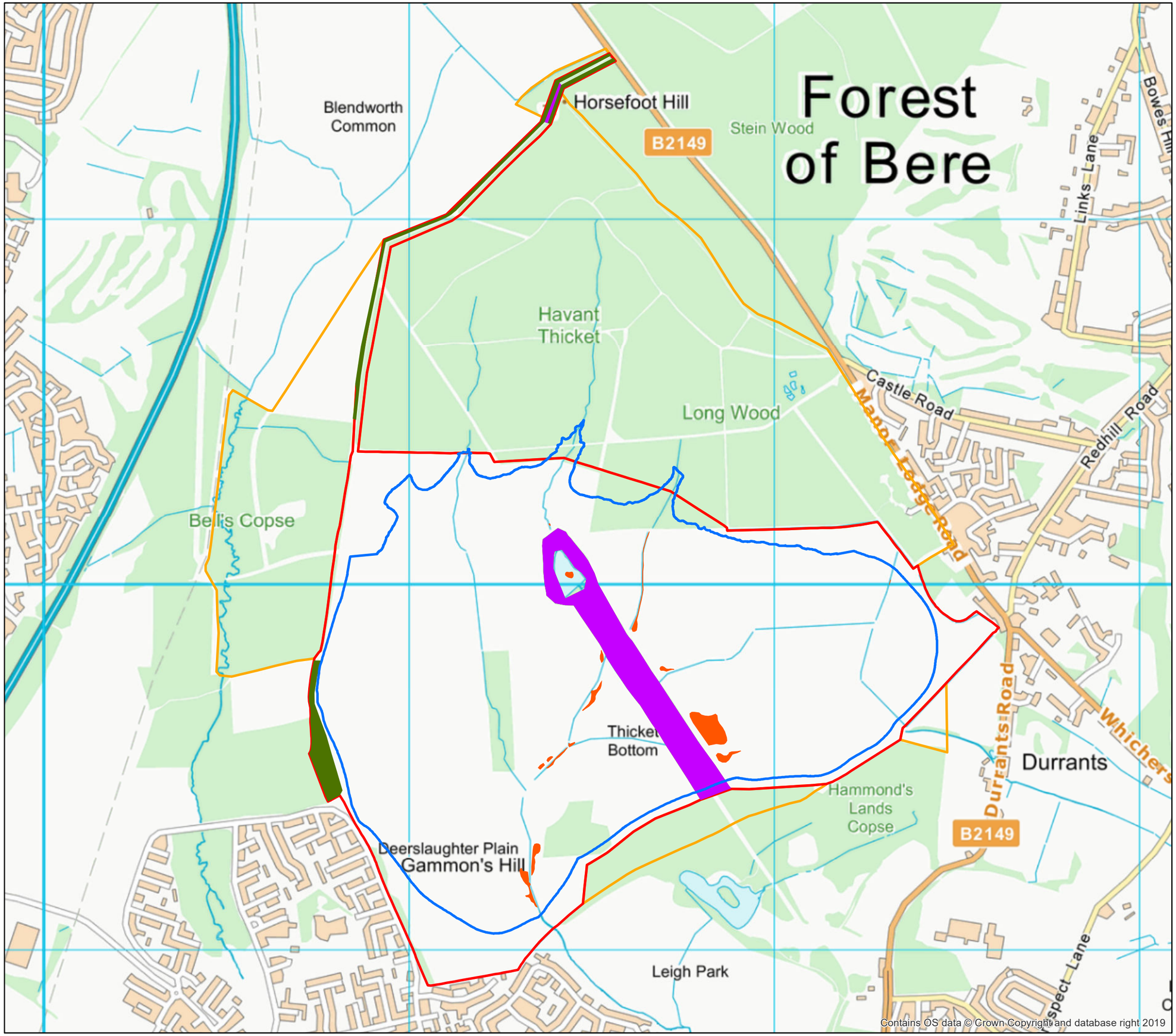

HAVANT THICKET WINTER STORAGE RESERVOIR

VEGETATION ASSESSMENT

Map C10 - Priority Habitat Loss

Client:	Portsmouth Water
Date:	September 2019
Status:	Final

KEY

- Site Boundary (the Site)
- Ecological Enhancement Area (wider site)
- Reservoir Footpoint
- Retained Lowland Mixed Deciduous Woodland

Priority Habitat Loss

- Lowland Mixed Deciduous Woodland Loss
- Purple Moor Grass and Rush Pastures Loss

Scale at A3: 1:10,000

0 125 250 500 Metres

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Appendix C1 2009 ECOSA HTWSR Vegetation Report – report available on request

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Appendix C2 Summary Information from Historic Maps and Botanical Surveys for the Four Woodland Blocks

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Table C15: Summary information from historic maps and botanical surveys for the four woodland blocks

Habitat Area	Woodland present on historic map						AWVP species	AWVP[27] abundance	Other Information / Comments
	1759	1791	1810	1842	1867	1898			
Corsican Pine plantation (W11)	Yes	No	No Only small patches of trees shown	No	Yes	Yes	16	Medium 69% rare or R/LF	▪ Oldest maps show open countryside, by 1791 there were some scattered trees. Pasture woodland first mapped in 1867, managed woodland by 1898. ▪ Little ground vegetation ▪ 16 AWVP indicators: Abundant 0, Frequent 0, Locally frequent or abundant 3, Occasional 2, Rare or R/LF 11, bluebell rare ▪ Four survey visits over two years (May).
Round Wood (W3)	No	No	No Only small patches of trees shown	No	Yes	Yes	7	Very low <10	▪ Oldest maps show open countryside, by 1791 there were some scattered trees. Pasture woodland first mapped in 1867, managed woodland by 1898. Oak plantation present by 1954. ▪ The ground flora is impoverished and ancient woodland indicator herbs are rare. ▪ 7 AWVP indicators: Abundant 0, Frequent 1, Locally Abundant 0, Locally Frequent 0. Occasional 2, Rare or R/LF 4; no bluebell observed. ▪ Four survey visits over four years (May, September and October)
Middle Clearing (W2)	No	No	No Only small patches of trees shown	No	Yes	No	16	Medium 69% rare	▪ Oldest maps show open countryside, by 1791 there were some scattered trees. Pasture woodland first mapped in 1867. Shown with tree cover in 1860 and 1932. Clearing on 1898 map and 1946 aerial photograph. Oak plantation present by 1954. ▪ The ground flora is impoverished and ancient woodland indicator herbs are rare. ▪ 16 AWVP indicators: Abundant 2, Frequent 1, Occasional 2, Rare or R/LF 11; no bluebell observed ▪ Four survey visits over four years (May, August and October)
The Avenue woodland (W1)	No	No	No Only small patches of trees shown	No	Yes	Yes	37[28]	Low 78% rare or R/LF	▪ Oldest maps show open countryside, by 1791 there were some scattered trees. Pasture woodland first mapped in 1867, managed woodland by 1898. ▪ The ground flora is species poor over most of the wood, but locally herb rich, particularly along the ride and next to one stream. ▪ 37 AWVP indicators: Abundant 0, Frequent 2, Locally frequent or abundant 4, Occasional 2, Rare or R/LF 29. Bluebell (rare) only observed in one small area west of Upper Lake. ▪ Six survey visits over four years (April, May, August, September and October) ▪ *Note: Frequency low despite much higher level of survey in The Avenue*

[27] The following criteria have been used to evaluate the abundance of Ancient Woodland Vascular Plant species (AWVP) based on the criteria in the DAFOR scale (see text Paragraph 2.4.1) and the survey information summarised in tables within Paragraph 3.3.2:

High	Less than 60% of species found were rare, with at least 5 frequent or locally abundant species present
Medium	Between 61 to 70% of species found were rare, with at least 3 frequent, locally abundant or locally frequent species present
Low	More than 70% of species found were recorded as rare
Very low	AWVP species recorded in that area was 10 or less, with none abundant.

[28] Much greater survey effort

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Habitat Area	Woodland present on historic map						AWVP species	AWVP[27] abundance	Other Information / Comments
	1759	1791	1810	1842	1867	1898			
Scout Hut Woodland (Cabbagefield Row)	No	No	No	No	Yes	Yes	19	Medium 58% rare or R/LF	▪ The 1791 map show some scattered tress in this area, with a woodland area to the west. ▪ The ground flora is species poor over most of the wood, but locally herb rich in the south. ▪ 19 AWVP indicators: Abundant or R/LA 1, Frequent 0, Locally frequent or abundant 3, Occasional or O/LF 4, Rare or R/LF 11. Bluebell Occasional. ▪ Two survey visits in one year (May)

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Appendix C3 Notable Plant Species Criteria for those Recorded and in the Desktop Study

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Table C16: Noteworthy/notable plant species status criteria

Species	Scientific Name	Red List: Endangered	Red List: Vulnerable	Red List: Near Threatened	Red List: Least Concern	South Hampshire Scarce	County Scarce	Hampshire BAP
Sneezewort	*Achillea ptarmica*				X			
Bog pimpernel	*Anagallis tenella*				X			
Hairy rock-cress	*Arabis hirsuta*			X		X	X	
Betony	*Betonica officinalis*				X			
Heather	*Calluna vulgaris*			X				
Star sedge	*Carex echinata*			X				
Common sedge	*Carex nigra*				X			
Pale Sedge	*Carex pallescens*				X			
Chaffweed	*Centunculus minimus*	X						
Lily-of-the-valley	*Convallaria majalis*				X			
Bell heather	*Erica cinerea*			X				
Cross-leaved heath	*Erica tetralix*			X				
Eyebright	*Euphrasia nemorosa*			X				
Wild strawberry	*Fragaria vesca*			X				
Dyer's greenweed	*Genista tinctoria*		X					
Bluebell	*Hyacinthoides non-scripta*				X			
Marsh pennywort	*Hydrocotyle vulgaris*			X				
Marsh St John's-wort	*Hypericum elodes*			X				
Bitter-vetch	*Lathyrus linifolius*			X				
Common cow-wheat	*Melampyrum pratense*			X				
Corn mint	*Mentha arvensis*			X				
Wood Millet	*Milium effusum*				X			
Creeping forget-me-not	*Myosotis secunda*				X		X	
Common twayblade	*Neottia ovata*				X			
Early purple-orchid	*Orchis mascula*				X			
Wood-sorrel	*Oxalis acetosella*			X				
Heath milkwort	*Polygala serpyllifolia*			X				

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Species	Scientific Name	Red List: Endangered	Red List: Vulnerable	Red List: Near Threatened	Red List: Least Concern	South Hampshire Scarce	County Scarce	Hampshire BAP
Solomon's-seal	*Polygonatum multiflorum*				X			
Tormentil	*Potentilla erecta*			X				
Goldilocks buttercup	*Ranunculus auricomus*				X			
Lesser spearwort	*Ranunculus flammula*		X					
Eared willow	*Salix aurita*				X		X	
Creeping willow	*Salix repens*			X				
Sanicle	*Sanicula europaea*			X				
Lesser skullcap	*Scutellaria minor*				X			
Ragged-robin	*Silene flos-cuculi*			X				
Goldenrod	*Solidago virgaurea*			X				
Devil's-bit scabious	*Succisa pratensis*			X				
Common valerian	*Valeriana officinalis*			X				
Heath speedwell	*Veronica officinalis*			X				
Western pouncewort	*Lejeunea lamacerina*							X

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Appendix C4 NVC Types

Full names of NVC types mentioned in this report (not all occur on the site or within the wider site).

M23a *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community

M23b *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus effusus* sub-community

M25b *Molinia caerulea-Potentilla erecta* mire, *Anthoxanthum odoratum* sub-community.

M29 *Hypericum elodes-Potamogeton polygonifolius* soakway

MG1a *Arrhenatherum elatius* grassland, *Festuca rubra* sub-community

MG1b *Arrhenatherum elatius* grassland, *Urtica dioica* sub-community

MG5a *Cynosurus cristatus-Centaurea nigra* grassland, *Lathyrus pratensis* sub-community

MG5c *Cynosurus cristatus-Centaurea nigra* grassland, *Danthonia decumbens* sub-community

MG6a *Cynosurus cristatus-Lolium perenne* grassland, Typical sub-community

MG6b *Cynosurus cristatus-Lolium perenne* grassland, *Anthoxanthum odoratum* sub-community

MG7b *Lolium perenne-Poa trivialis* leys

MG7d *Lolium perenne-Alopecurus pratensis* grassland

MG7e *Lolium perenne-Plantago lanceolata* grassland

MG9a *Holcus lanatus-Deschampsia cespitosa* grassland, *Poa trivialis* sub-community

MG9b *Holcus lanatus-Deschampsia cespitosa* grassland, *Arrhenatherum elatius* sub-community

(MG9 sub-communities were not distinguished during the present survey - most examples are intermediate between the two.)

MG10a *Holcus lanatus-Juncus effusus* rush-pasture, *Juncus effusus* sub-community

MG10b *Holcus lanatus-Juncus effusus* rush-pasture, *Juncus inflexus* sub-community

MG12a *Festuca arundinacea* [=*Schedonorus arundinaceus*] grassland, *Holcus lanatus* sub-community

MG13 *Agrostis stolonifera-Alopecurus geniculatus* grassland

S22 *Glyceria fluitans* water-margin vegetation

S23 Other water margin vegetation

U4a *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, Typical sub-community

U4b *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, *Holcus lanatus-Trifolium repens* sub-community

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U4c *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, *Lathyrus montanus* [= *L. linifolius*]-*Stachys betonica* [=*Betonica officinalis*] sub-community

U20a *Pteridium aquilinum-Galium saxatile community*, *Anthoxanthum odoratum* sub-community

W1 *Salix cinerea-Galium palustre* woodland

W4a *Betula pubescens-Molinia caerulea* woodland, *Dryopteris dilatata-Rubus fruticosus* sub-community

W4b *Betula pubescens-Molinia caerulea* woodland, *Juncus effusus* sub-community

W4c *Betula pubescens-Molinia caerulea* woodland, *Sphagnum* species sub-community

W7c *Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum* woodland, *Deschampsia cespitosa* sub-community

W8b *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Anemone nemorosa* sub-community

W8c *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Deschampsia cespitosa* sub-community

W8d *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Hedera helix* sub-community

W10a *Quercus robur-Pteridium aquilinum-Rubus fruticosus woodland*, Typical sub-community

W10c *Quercus robur-Pteridium aquilinum-Rubus fruticosus woodland*, *Hedera helix* sub-community

W10d *Quercus robur-Pteridium aquilinum-Rubus fruticosus woodland*, *Holcus lanatus* sub-community

W16a *Quercus species-Betula species-Deschampsia flexuosa* woodland, *Quercus robur* sub-community

W21 *Crataegus monogyna-Hedera helix* scrub

W22: *Prunus spinosa-Rubus fruticosus* scrub

W25a *Pteridium aquilinum-Rubus fruticosus* underscrub, *Hyacinthoides non-scripta* sub-community

W25b *Pteridium aquilinum-Rubus fruticosus* underscrub, *Teucrium scorodonia* sub-community

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Appendix C5 Summary of Vegetation Types in Relation to NVC Types and Extent

Table C17: Summary of vegetation types (**Map C7**)

Mapped Vegetation Type	NVC Types and Extent	Priority Habitat
Broadleaved woodland (including plantation)	Semi-natural broadleaved woodland on dry to damp, neutral to acidic soils (**W10a** and **W10c**) and more strongly acidic soils (**W16a**). These types predominate over the site and include secondary woodland that may have developed over former dry heath or after past clearances and some replanted beech within Havant Thicket. Smaller stands of older semi-natural woodland occur within areas W4, W8, W9 and W11 on damper, slightly base rich soils, often next to watercourses **(W8b, W8c, W8d)**. A small area of wet woodland within the Avenue may be intermediate between **W8** and **W7c**. Middle Clearing and Round Wood consist of plantation oak woodland (**W10d**).	Partly (Lowland Mixed Deciduous Woodland)
Coniferous plantation	Areas of woodland dominated by mature planted conifers. Includes the Corsican Pine plantation (W11) (modified **W10a**) and the woodland to the north-west of Havant Thicket car park (W13) (modified **W4c**).	No
Former heathland developing into scrub and secondary woodland	Areas of mostly dense, thicket-stage tree scrub on damper, strongly acidic soils, dominated by downy birch with frequent aspen (developing **W4**) or locally drier (developing **W10/W16**). Some bracken stands (**W25**) also occur (e.g. in H1). Damp, heathy vegetation with frequent Purple Moor-grass (**M25b**) occurs in small clearings and along ride edges.	No (Some areas may qualify as Wet Woodland or will develop into this in the future if left unmanaged. Small areas of underlying vegetation may qualify as Purple Moor Grass and Rush Pastures or Lowland Heathland.)
Dry neutral to acid grassland	Predominantly herb poor dry grassland (**MG6a**) with some moderately herb rich grassland (**MG6b and MG5a**) in a few small areas. Includes areas of ranker herb poor grassland (**MG1a**), especially west of the northern half of the Avenue (G10) and on the hill slope in the south-west (G11). Enriched rough grassland (**MG1b**) occurs in small stands only. Improved herb poor dry grassland (**MG7b**) occurs over most of Gipsies Plain (G6) and next to Havant Thicket car park (G14).	No (no large or well-defined areas of MG5a occur that would qualify as Lowland Meadows)
Dry acid grassland and bracken	Moderately herb rich dry acid grassland with bracken (**U20a**) covers most of the Blendworth Common survey area (G15); some damper areas could be assignable to (**U4c**) and herb rich areas without bracken are transitional to **MG5c**. Herb rich acid grassland (**U4b**) occurs in the grassy clearing to north-west of Havant Thicket car park (G13).	Yes (Lowland Dry Acid Grassland)

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Mapped Vegetation Type	NVC Types and Extent	Priority Habitat
Damp to wet grassland and developing rush pasture	Damp species poor to moderately herb rich grassland consisting of transitions between **MG6a** and **MG10a** or **M23a** over much of the site, with **MG9** dominant in G9 and G10. **MG6a-M23a** transitions may have frequent marsh thistle, lesser spearwort, greater bird's-foot-trefoil or other characteristic M23 species but lack any sharp-flowered rush. Wetter species poor grassland (**MG7d**) occurs in south-west of G1 and south-east corner of G11, with **MG13** locally in small grazed hollows. Wet, species poor rank grassland in G11 may be assignable to **MG12a**.	No
Species poor rush pasture and wetland vegetation	Relatively herb poor marshy vegetation with frequent to abundant rushes (**MG10a** and **MG10b**); occurring in flushes and along spring lines and watercourses. Includes small, localised stands of sweet-grass (**S22**) and marginal wetland plants, such as fool's-watercress (**S23**).	No
Species rich marsh and rush pasture	Better developed, species rich areas of **M23a** and **M23b** where sharp-flowered rush is usually present, and other rushes are frequent to abundant. At the southern end of watercourse S2 and within Upper Lake the vegetation is more strongly acidic and transitional to **M29**. There is an area of Purple Moor-grass mire (**M25b**) at the southern end of Blendworth Common (G15).	Yes (Purple Moor Grass and Rush Pastures)
Made-up tracks with grass verges	Various dry and damp grassland vegetation falling into the above categories, but also including a mostly species poor type grassland on compacted gravel (**MG7e**) and some strips and patches of herb rich grassland (**MG5a**) (e.g. alongside T20 and at junction of T2 and T4). Acid grassland occurs along track T1/T2 as part of a mown bracken/bramble community (**W25b**). Small areas of **W25a** and **W25b** occur alongside other tracks.	Partly (some may fall under Lowland Dry Acid Grassland, Lowland Meadows and Purple Moor Grass and Rush Pastures)
Willow scrub	Grey willow trees and bushes along watercourses and field boundary ditches overlying grassland and marsh vegetation. A small area of closed canopy wet woodland (**W1**) occurs along watercourse S2.	No
Other scrub	Mixed native deciduous shrubs and trees (including grey willow) forming clumps or linear stands in places but not managed as hedgerows (**W21**, **W22**).	No

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Appendix C6 Notable/Noteworthy Plant Species

Red List status (Stroh, et al., 2014): EN = Endangered, VU = Vulnerable, NT = Near Threatened

Table C18: Notable/noteworthy species notes of plants recorded in 2009 and 2018 (see **Map C8** for locations)

Common name	Scientific name	Red List	Recorded Within Site Boundary	Status within the Site and / or Wider Site	Hampshire status and habitat
	Vascular plants				
Sneezewort	*Achillea ptarmica*	LC	Y	Within the site boundary records are widely scattered. Recorded from T3, T14, T15, T20, S3, S4, S6 and G7.	Common in damp acid grassland in the New Forest, but uncommon and probably declining elsewhere.
Bog pimpernel	*Anagallis tenella*	LC	N	Recorded from a trackside in western part of Havant Thicket woodland in 2009, SU 7114 1066. Area not resurveyed in 2018.	Common in New Forest and NE heaths.
Betony	*Betonica officinalis*	LC	Y	Scattered. Within the site recorded from T7, T14, W1, W2, S3 and S4.	Uncommon but widespread in acid grassland, wood margins and heathland.
Heather	*Calluna vulgaris*	NT	Y	Scattered to locally frequent. Only recorded from T7 within the site boundary.	Abundant and widespread on heaths.
Star sedge	*Carex echinata*	NT	N	Recorded from boggy stream in H3.	Frequent in wet heath/bog vegetation in New Forest and local in NE heaths.
Common sedge	*Carex nigra*	LC	Y	Patches by one of the streams in the Avenue and at eastern end of the Corsican Pine Plantation (W11).	Local but widespread species of base rich wet grassland and mire.
Pale Sedge	*Carex pallescens*	LC	Y	Previously recorded by ECOSA on 2009 in the Corsican Pine Plantation (W11).	Local species of acidic woodland rides.
Chaffweed	*Centunculus minimus*	EN	N	Recorded only from a trackside in western part of Havant Thicket woodland in 2009, SU 7114 1066. Although lying outside the wider survey area, the location was checked in 2018, but it was not refound (though could still be present).	Widespread in New Forest on damp heathland; rare in NE Hants.

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Common name	Scientific name	Red List	Recorded Within Site Boundary	Status within the Site and / or Wider Site	Hampshire status and habitat
Lily-of-the-valley	*Convallaria majalis*	LC	N	Patch on eastern side of Havant Thicket woodland, SU 7186 1081 recorded in 2009. The species was observed in the same location during 2018, although this part of Havant Thicket woodland was not subject to a formal resurvey.	Local species of strongly acidic woodland.
Bell heather	*Erica cinerea*	NT	N	Recorded at one location in Havant Thicket woodland by HBIC surveys.	Abundant and widespread on heaths.
Cross-leaved heath	*Erica tetralix*	NT	N	Occasional to locally frequent in damp, heathy parts of Havant Thicket.	Common and widespread on wet heaths.
Eyebright	*Euphrasia nemorosa*	NT	N	Recorded from one track in Havant Thicket woodland in 2009, confirming a single old historical record.	Widespread but uncommon in dry grassland.
Wild strawberry	*Fragaria vesca*	NT	N	Recorded from the more base rich woodlands, including Bells Copse and SCP by HBIC and present survey.	Widespread and common.
Dyer's greenweed	*Genista tinctoria*	VU	N	Old record from Bells Copse.	Scattered/local and declining species of neutral meadows.
Marsh pennywort	*Hydrocotyle vulgaris*	NT	Y	Present at Upper Lake and in the streams ditches at various locations within the site (S1, S2, S3, S5, S6 and T14).	Widespread and locally common, especially in New Forest.
Marsh St John's-wort	*Hypericum elodes*	NT	Y	Newly recorded from stream on north side of The Avenue (S2) and long known from Upper Lake; also recorded by HBIC from Thicket Bottom (G7).	Common and widespread in New Forest in acidic runnels and bog margins; local elsewhere.
Bitter-vetch	*Lathyrus linifolius*	NT	Y	Present in Middle Clearing; abundant on Blendworth Common; a few other records for Havant Thicket woodland.	Widespread but rather local species of acidic habitats.
Common cow-wheat	*Melampyrum pratense*	NT	N	One patch discovered in W4 in 2018. No other records for the site or wider site.	Widespread but local in acidic woodland.

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Common name	Scientific name	Red List	Recorded Within Site Boundary	Status within the Site and / or Wider Site	Hampshire status and habitat
Wood Millet	*Milium effusum*	LC	Y	Recorded from the Avenue (W1), W9 and W11, plus a few other HBIC records.	Widespread but uncommon ancient woodland species.
Creeping forget-me-not	*Myosotis secunda*	LC	Y	Newly recorded for the site in 2018 at southern end of stream north of the Avenue (S2) and on east side of Upper Lake.	Common and widespread in New Forest in acidic marsh; local elsewhere.
Common twayblade	*Neottia ovata*	LC	N	Recorded in SCP during previous surveys undertaken by ECOSA in 2009. Area not resurveyed in 2018.	Widespread but uncommon in calcareous woodlands and grassland.
Early purple-orchid	*Orchis mascula*	LC	N	Colony in SCP; also recorded from adjacent part of W4.	Widespread but uncommon in calcareous woodlands and grassland.
Wood-sorrel	*Oxalis acetosella*	NT	Y	Locally frequent over site, including the Avenue (W1) and woodland in Havant Thicket woodland (W8, W9, W11 and W15).	Common and widespread in ancient woodland.
Heath milkwort	*Polygala serpyllifolia*	NT	N	Locally frequent on Blendworth Common; not recorded elsewhere on the site.	Widespread and locally frequent on dry heaths and acid grassland.
Solomon's-seal	*Polygonatum multiflorum*	LC	N	Only recorded from Bell's Copse south in 2009.	Widespread but uncommon in ancient woodland; Hampshire may be the British stronghold for the species.
Goldilocks buttercup	*Ranunculus auricomus*	LC	N	Recorded from SCP during previous surveys undertaken by ECOSA in 2009. The species was observed in the same location during 2018, although the SCP woodland was not subject to a formal resurvey.	Uncommon and scattered in damp grasslands and ancient woodlands; probably declining.
Lesser spearwort	*Ranunculus flammula*	VU	Y	Locally abundant in damp grassland, especially on eastern side of the Avenue; strongly increased since 2009.	Widespread in acidic marshy grassland, especially in New Forest.
Eared willow	*Salix aurita*	LC	Y	Scattered on track sides and along streams, often as hybrid with grey willow. Within the site recorded from T6 and T14. Within the wider	Uncommon species of wet heath and boggy habitats, most frequent in New Forest.

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Common name	Scientific name	Red List	Recorded Within Site Boundary	Status within the Site and / or Wider Site	Hampshire status and habitat
				site recorded from two locations in Havant Thicket woodland.	
Creeping willow	*Salix repens*	NT	Y	One patch on track T14 now not recorded in 2018 and likely to no longer be present at the site.	Common and widespread in New Forest in wet heath; more local elsewhere.
Sanicle	*Sanicula europaea*	NT	Y	Recorded from the Avenue (W1), W8 and W15.	Widespread and common ancient woodland and scrub species, especially on calcareous soils.
Lesser skullcap	*Scutellaria minor*	LC	Y	Recorded along streams S2 and S3; other scattered records for Havant Thicket woodland and Upper Lake.	Widespread, uncommon species of damp acid woodland and heathland.
Ragged-robin	*Silene flos-cuculi*	NT	Y	Scattered in wet grassland and watercourses; recorded from G2, G5, G10, W2, W9, S3, S7 and T5.	Widespread in unimproved wet grassland but probably declining.
Goldenrod	*Solidago virgaurea*	NT	Y	Havant Thicket woodland, especially on west side, including T2 and adjacent parts of Blendworth Common; also the Avenue (W1).	Uncommon species of acid woodland and grassland.
Devil's-bit scabious	*Succisa pratensis*	NT	N	Blendworth Common/Bells Copse and scattered over Havant Thicket woodland area (G13, W13, H1).	Widespread, uncommon species of unimproved damp acidic grassland.
Heath speedwell	*Veronica officinalis*	NT	Y	Scattered over site on patches of short, dry grassland (G11, G13, W2, T3, T18).	Widespread and locally frequent in acid grassland and dry heath.
	Mosses				
	Sphagnum squarrosum	n/a	N	In willow carr and ponds north of the car park (W13, H6).	Widespread but local in shaded willow and birch carr.

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Appendix C7 Sites Designated for Nature Conservation

Local Nature Reserves

Local Nature Reserves (LNRs) are designated by local authorities under the National Park and Access to the Countryside Act 1949. These are generally designated not only for their local wildlife value but also for education, scientific and recreational purposes. These sites generally receive protection from development through the planning system.

Non-Statutory Sites

In addition to statutory designations, local authorities often designate sites of nature conservation importance at the local level. Such designations are named differently by each local authority and may be referred to as Local Wildlife Sites (LWSs), Sites of Importance for Nature Conservation (SINCs) or Sites of Nature Conservation Importance (SNCIs), amongst others. The exact level of protection afforded to these sites varies and is normally defined through local planning policy.

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