

Havant Thicket Reservoir Project

Environmental Statement Volume 4 - Appendices

Appendix A9 Biodiversity

A9.1 Desk Study (Part 1 of 2)

Portsmouth Water Ltd.

04/09/20

Atkins Doc No.: HTR-ATK-ZZ-ZZ-RP-Z-0146

Atkins Revision No.: C01

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Notice

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Document history

PW Revision	Status	Purpose description	Originated	Checked	Reviewed	Authorised	Date
C01	B1	Final	KT	SG	CW	LJB	04/09/20
P03	S2	Final	KT	SG	LG	---	28/08/20
P02	S2	Final Issue	KT	SG	LG	---	14/08/20
P01	S3	First Issue	SG	KT	CW	---	22/05/20

Client signoff

Client	Portsmouth Water Ltd.
Project	Havant Thicket Reservoir Project
Job number	5169117
Client signature / date	

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Appendix A9.1 Desk Study

Introduction

Biodiversity Features

- 1.1. This Appendix presents the findings of the desk-based study in relation to the following biodiversity features:
- Statutory designated sites for nature conservation;
 - Non-statutory designated sites for nature conservation;
 - Irreplaceable habitats – ancient woodland, veteran trees and notable trees;
 - Priority habitats;
 - Protected and priority species; and,
 - Invasive non-native plant species (INNPS).

The Site

- 1.2. The Site includes the Havant Thicket Reservoir Site (the Reservoir Site) and the Pipeline Corridor, that runs between the Reservoir Site and the Bedhampton and Havant Springs Pumping Site. Records throughout this appendix are discussed in relation to their distance from these separate sites that combined together form the Site.

The Study Area

- 1.3. The extent of the EZoI (the study area) for the desk study and field survey was reviewed and re-defined prior to the assessment of potential impacts based on the results of the desk study and field surveys, and the refined design.
- 1.4. The desk study was carried out by Atkins in May 2020 taking account of the confirmed planning application boundary. The EZoI for this desk study is provided in Table 1.

Table 1 - Desk Study Ecological Zone of Influence (EZoI)

Data Type	Search area – distance from site
SACs where bats are one of the qualifying species	30 km
Statutory designated sites: Special Areas of Conservation (SACs and cSACs), Special Protected Areas (SPAs and pSPAs), Wetlands of International Importance (Ramsar sites) and potential Ramsar sites	5 km
Statutory designated sites: Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs)	2 km
Non-statutory designated sites for nature conservation and ancient woodland	2 km
Bechstein's bat and barbastelle bats	10 km
Other bat species	3 km
Legally protected species (except bats)	2 km
Priority habitats and species and invasive non-native plant species (INNPS) and invasive non-native animal species	1 km
Waterbodies that may potentially be utilised by breeding great crested newts	500 m
Veteran and Notable Trees	50 m
Aquatic habitats and species (watercourses and standing waterbodies) ¹	2 km

¹ An initial desk study area of 150 m was used for the identification of aquatic features (watercourses and standing waterbodies) that could potentially be affected by the Scheme. Where a watercourse was identified within 150 m of the Scheme, the desk study area was extended up to 2 km upstream and downstream on that watercourse to identify any species/habitat records for the specific feature to inform the baseline conditions. Further details on aquatic ecology study area are provided in Chapter 9 Biodiversity - **Appendix A9.3** of the Environment Statement.

Legislative and Policy Framework

- 1.5. The biodiversity regulatory and policy framework relevant to the Scheme is summarised below.

National Planning Policy

The National Planning Policy Framework (2019)

- 1.6. The National Planning Policy Framework (NPPF) – revised 19 February 2019, sets out the Government’s planning policies for England and provides a framework within which the appropriate local authority can produce local and neighbourhood plans; the NPPF is a material consideration in making planning decisions.
- 1.7. The NPPF sets out three overarching objectives in achieving sustainable development, these are interdependent and need to be considered in mutually supportive ways. Economic, social and environmental objectives should be delivered through the preparation and implementation of plans and application of the policies within the NPPF. The NPPF also notes the importance that planning policies and decisions should play in providing an active role in guiding development towards sustainable solutions, which should also respond to local circumstances, reflecting local character and the needs and opportunities of each area. Key parts of the NPPF of relevance to this EIA are:
- Chapter 14 Meeting the challenge of climate change, flooding and coastal change
 - Planning for climate change
 - Paragraph 149: Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures.

Chapter 15 Conserving and enhancing the natural environment

- 1.8. As set out within Paragraph 11 of the NPPF ‘Plans and decisions should apply a presumption in favour of sustainable development’. However, Paragraph 177 goes on to state that ‘The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that there will be no adverse effect from the plan or project on the integrity of the habitats site.’
- 1.9. The general impetus of the NPPF in relation to ecology and biodiversity is for development proposals to not only minimise the impacts on biodiversity but also to provide enhancement. Paragraph 170 states that the planning system should contribute to and enhance the natural environment by ‘...minimising impacts on biodiversity and providing net gains in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures...’.
- 1.10. A number of principles are set out in Paragraph 175, including that where harm cannot be adequately avoided then it should be mitigated for, or as a last resort, compensated for. Where impacts occur on nationally designated sites, the benefits must clearly outweigh any adverse impact and incorporating biodiversity in and around developments should be encouraged. Specific reference is also made to the protection of irreplaceable habitats. Where loss to irreplaceable habitats occur planning permission would normally be refused unless there are wholly exceptional reasons and an adequate compensation strategy is in place. Paragraph, 175, Note 58 confirms that wholly exceptional reasons would include infrastructure projects where the public benefit would clearly outweigh the loss or deterioration of habitat.
- 1.11. Paragraph 175 also states ‘development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity’. Protection of sites proposed as Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites or acting as compensation for SPAs, SACs and Ramsar sites, should receive the same protection as habitat sites.
- 1.12. In addition to the NPPF, Circular 06/05 provides guidance on the application of the law relating to planning and nature conservation as it applies in England. Paragraph 98 states ‘the presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat’. Whilst paragraph 99 states ‘it is essential that the presence or otherwise of a protected

species, and the extent that they may be affected by the proposed development, is established before planning permission is granted'.

- 1.13. The full text for Chapter 15 – Conserving and enhancing the natural environment is given below:
- 1.14. Paragraph 170: Planning policies and decisions should contribute to and enhance the natural and local environment by:
 - a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
 - b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
 - c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;
 - d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
 - e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
 - f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.
- 1.15. Paragraph 171: Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework ; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.
- 1.16. Paragraph 172: Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas and should be given great weight in National Parks and the Broads. The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major development other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest. Consideration of such applications should include an assessment of:
 - a) the need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy;
 - b) the cost of, and scope for, developing outside the designated area, or meeting the need for it in some other way; and
 - c) any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.
- 1.17. Paragraph 173: Within areas defined as Heritage Coast (and that do not already fall within one of the designated areas mentioned in paragraph 172), planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate, unless it is compatible with its special character.

[Habitats and biodiversity](#)
- 1.18. Paragraph 174: To protect and enhance biodiversity and geodiversity, plans should:
 - a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity ; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and

b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

1.19. Paragraph 175: When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

1.20. Paragraph 176: The following should be given the same protection as habitats sites:

a) potential Special Protection Areas and possible Special Areas of Conservation;

b) listed or proposed Ramsar sites; and

c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

1.21. Paragraph 177: The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

Local Planning Policy (Current)

1.22. The site boundary straddles two Hampshire districts, Havant and East Hampshire. The boundary of these districts passes through the centre of The Avenue, effectively splitting the site in half. As a result, Local Planning Policy from both Havant Borough Council and East Hampshire District Council has been included.

1.23. The HTWSR site is safeguarded in the existing 2014 East Hampshire District Council Core Strategy 2014, the reservoir and associated pipeline is safeguarded in the Havant Borough Council Core Strategy 2011. The reservoir site is also safeguarded in the emerging Local Plans for East Hampshire District Council and Havant Borough Council.

Havant Borough Council Core Strategy (2011)

1.24. The Havant Borough Council 'Core Strategy' is the current planning policy for Havant along with the 'Local Plan (Allocations)' 2014. The Core Strategy was adopted in 2011 and sets out the planning framework until 2026. The Local Plan 2036 (currently in draft format) will replace the core strategy and is hoped to be adopted in 2020.

1.25. Policies within the Local Plan (Core Strategy) that are relevant to the Ecological Impact Assessment are:

Policy CS11 Protecting and Enhancing the Special Environment and Heritage of Havant Borough

1.26. This policy refers in part to biodiversity stating that planning permission will be granted for development that protects and, where possible, enhances the borough's statutory and non-statutory designated habitats and features of biological interest through appropriate adaptation and mitigation

measures, has particular regard for nature conservation designations with international designations given the highest regard, protects wildlife habitats and corridors to prevent fragmentation and to allow species to adapt to climate change and acknowledges the emerging evidence from the Solent Disturbance and Mitigation Project and published recommendations and further research.

Policy CS13 Green Infrastructure

- 1.27. This policy states that development will be permitted that:
1. Maintains and manages the network of green infrastructure identified at the sub regional and local levels.
 2. Incorporates, where appropriate, improvements to existing green infrastructure through the restoration, enhancement or creation of additional resources.
 3. Does not undermine the functional integrity of the green infrastructure.
 4. Creates, where appropriate, new green infrastructure (including access management measures) either through on site provision or financial contributions.
- 1.28. Development proposals that adversely affect green infrastructure will not be permitted unless superior alternative provision can be provided or where it is part of a service provider's plans to provide improved local services in equally accessible locations.
- 1.29. Green infrastructure sites will be allocated in the Development Delivery (Allocations) Plan.

Policy CS18 Strategic Site Delivery (Strategic Site 2 Havant Thicket Reservoir)

- 1.30. This policy details that Portsmouth Water Company has identified a winter storage reservoir as a key infrastructure requirement to meet the demand for increased water supply in South Hampshire. The policy identifies that an Environmental Impact Assessment (EIA) leading to the production of an environmental statement is required in accordance with Schedule 2 of the Town and Country Planning Act (Environmental Impact Assessment) (England and Wales) Regulation 1999. This is a result of the following key constraints:
1. Sites of Importance for Nature Conservation (SINC) within or adjacent to the site;
 2. The adjacent Sir George Staunton Conservation Area, including The Avenue and the registered park and garden of special historic interest (grade II* listed building);
 3. Areas of ancient semi-natural woodland and planted woodland; and
 4. Great Copse (in relation to routeing of the pipeline).

Policy DM9: Development in the Coastal Zone

- 1.31. This policy refers to the protection of the coastal zone. The relevant part of the policy with regards to ecology states that permission will only be granted in the coastal zone where it can be demonstrated that there will be no harmful effects on nature conservation within the Chichester and Langstone Harbour SSSIs and SPA, Solent Maritime SAC and Ramsar site, or any SINC's and Local Nature Reserves.

Within the emerging Havant Borough Council Local Plan 2036 there is a specific policy KP9 which relates to HTWSR.

Policy KP9: Havant Thicket Reservoir

- 1.32. The specific points which relate directly to ecology include the requirement that the natural character is conserved in particular by;
1. Limiting impacts on biodiversity including the creation of additional habitats;
 2. Compensating for the loss of, and effects on, Sites of Importance for Nature Conservation (SINC's);
 3. Ensuring that the pipeline avoids Great Copse, which should be protected during construction;
 4. Integrating the reservoir into the existing landscape of the area;
 5. Minimising the loss of ancient woodland and trees;
 6. Appropriate mitigation measures, including buffers, are put in place for Bechstein's bat in line with Policy E15;
 7. The potential impacts on the Langstone and Chichester Harbours as well as the Hermitage Stream have been assessed under the appropriate regulations and any necessary avoidance and mitigation measures included in the scheme design;

8. Opportunities for biodiversity enhancements associated with the reservoir and the Hermitage Stream are realised wherever possible; and
9. Opportunities arising from the new pipe works are taken to enhance the habitats along the stream corridors.

Havant Borough Council Local Plan (Allocations) Adopted Version (2014)

- 1.33. The Havant Brough Local Plan (Allocations) follows on from the Havant Borough Local Plan (Core Strategy) which together provides up to date polices for the borough. The Allocations plan was adopted in 2014. Policies within the Allocation Plan that are relevant to the Ecological Impact Assessment are:
[Policy AL6 Havant Thicket Reservoir Pipeline](#)
- 1.34. This policy states that planning permission will be granted for development proposals that help deliver the Havant Thicket Reservoir pipeline as shown on the Policies Map. Development proposals will not be permitted in the pipeline route buffer zone, where it could prevent the future delivery of the pipeline.
- 1.35. Havant Thicket Reservoir is a proposed winter water storage facility on the border of Havant Borough and East Hampshire District. This is an allocated strategic site in Core Strategy Policy CS18, as it is a key piece of infrastructure required to meet the demand for increased water supply in South Hampshire. In order to serve the reservoir, a pipeline needs to be constructed from the Havant and Bedhampton Springs.
- 1.36. The pipeline route, shown on the Policies Map, has been identified by Portsmouth Water Company (the infrastructure provider) in consultation with Havant Borough Council, Portsmouth City Council and Hampshire County Council. The company has sought to ensure that where practicable the proposed route will run through the open space alongside the Hermitage Stream and Riders Lane Stream. Every effort has been made to avoid the main roads through Bedhampton and Leigh Park, as well as private gardens and allotments. Only short sections of the trench will be excavated at any one time to help minimise local disruption.
- 1.37. The pipeline route includes a core buffer zone extending five metres either side of the pipeline. Development will not be permitted in this core buffer zone. An outer buffer of a further five metres either side of the core buffer has also been identified and Portsmouth Water will be consulted on any planning applications within this area. This is to make sure that new development allows the effective delivery of the pipeline route. Carefully planned development in this outer buffer is less likely to affect the delivery of the pipeline, however, applicants should still demonstrate that the developments can function well together.
- 1.38. A slightly wider safeguarded zone (up to 25m wide) is identified on the pipeline route immediately north and south of Purbrook Way, in order to accommodate underground chambers required in association with the use of the pipeline. The ground above the chambers would be reinstated to grass to restore the current public open space use on completion of the construction.
- 1.39. Two routes at the north end of High Lawn Way are shown as safeguarded for the pipeline. The preferred route will be determined at the planning application stage when more information is available, including an environmental impact assessment.

[Policy AL7 Hermitage Stream](#)

- 1.40. This policy states that planning permission will be granted for development proposals that positively contribute to the improvement of the Hermitage Stream, as shown on the Policies Map.
- 1.41. Planning applications for development proposals within proximity of the Hermitage Stream that prevent improvements to the Hermitage Stream being delivered, may be refused.
- 1.42. The Hermitage Stream Restoration Project is a project being coordinated by Havant Borough Council, the Environment Agency, Hampshire Wildlife Trust, Groundwork Solent and Hampshire County Council (for the Park School section). The aim of the project is to restore five reaches of the canalised Hermitage Stream to a more natural setting. These improvements are planned for the land adjacent to the stream as well as the channel itself. These are mostly in the Leigh Park area, with a small section in Havant and Bedhampton.

[Policy AL8 Local Green Spaces](#)

- 1.43. This policy states that Planning permission will be granted for development proposals that protect or enhance the Local Green Spaces, as shown on the Policies Map.
 - 1.44. Development proposals that would be harmful to these Local Green Spaces will not be permitted other than in very special circumstances.
 - 1.45. The NPPF allows local authorities to designate green space for special protection as Local Green Space. The government makes it very clear in paragraphs 76 and 77 of the NPPF that this designation should not be applied to most green areas or open space. A Local Green Space is a space that is in reasonably close proximity to the community it serves; where it is demonstrably special to the local community and holds a particular significance, for example because of its beauty, historic significance, recreational value (including as a playing field), tranquillity or richness of its wildlife; and where it is local in character and is not an extensive tract of land. A number of Local Green Spaces have been designated across the five areas of the Borough. These are shown on the Policies Map and are listed in the relevant area section of the plan.
 - 1.46. The Local Green Spaces were nominated by the local community as part of the public consultation on the Draft Allocations Plan published in December 2012. Most of the strategic open spaces designated under CS1 of the Core Strategy have also been designated as Local Green Spaces. The methodology for designating these sites along with a full list of nominated sites is set out in the background document Local Green Spaces in Havant Borough (2013). In accordance with the NPPF these spaces are local in character and are not extensive tracts of land. They are all demonstrably special to the local community for a wide variety of reasons including beauty, historical significance, recreational value, tranquillity or richness of wildlife.
 - 1.47. Planning permission will only be granted for development proposals in very special circumstances. These exceptions are set out in paragraphs 89 and 90 of the NPPF and include essential utility development, the provision of appropriate facilities for outdoor sport and recreation and appropriate extensions or alterations to existing buildings
- Policy DM23 Sites for Brent Geese and Waders**
- 1.48. This policy states that planning permission will be granted for developments that avoid important sites for Brent Geese and/or waders outside of the statutory designated areas, identified on the Policies Map.
 - 1.49. Where this cannot be avoided, development proposals on or adjacent to an important Brent Goose and/or wader site outside of the statutory designated areas will need to demonstrate levels of impact, alone and in combination with other proposals subject to the tests of the Habitats Regulations. Where a negative impact upon a site cannot be avoided or satisfactorily mitigated, and the tests of the Habitats Regulations are met as necessary, replacement feeding/roosting habitat, on a no net loss basis, will be sought.
 - 1.50. Where a negative impact upon an important site cannot be avoided or mitigated and replacement feeding/roosting habitat is not or cannot be provided on a no net loss basis, the proposal will be refused.
 - 1.51. Planning permission will be granted for development on or adjacent to uncertain sites for Brent Geese and/or waders outside of the statutory designated areas, where appropriate surveys are undertaken, and it is determined that the site has no importance.
 - 1.52. Havant Borough is an internationally important wintering location for Brent Geese and wading bird species and as a result the coastal areas around Chichester and Langstone Harbours have been designated as Special Protection Areas (SPAs). Brent Geese and wading bird species are dependent on a network of habitats for feeding and roosting that fall outside of the SPAs. The sites of value have been identified in the Solent Waders and Brent Goose Strategy (2010) and identified as sites of 'important' or 'uncertain' value. These sites are critically linked to the integrity of the European and internationally designated sites and their development should be avoided where possible, and where this cannot be avoided negative impacts should be mitigated.
 - 1.53. Proposals on or adjacent to important Brent Geese and wading bird sites must be assessed and subject to the tests of the Habitats Regulations, in order to demonstrate levels of impact, alone and in combination with other proposals. Suitable avoidance and mitigation measures will be required, proportionate to the level of risk to the SPA bird populations, and those measures put in place prior to development taking place. These measures may include carrying out construction works outside of the core winter period (October-March inclusive) or enhancing the feeding or roosting site to

increase its capacity through favourable management. Such measures should be subject to consultation between the council and Natural England.

- 1.54. Where a negative impact upon a site cannot be avoided or satisfactorily mitigated, and the tests of the Habitats Regulations are met as necessary, replacement habitat may be considered. Replacement habitat may include the creation of new feeding or roosting sites (or 'refuges'), or improvements to the management of less frequently used sites to provide an equivalent level of resource. Given the right conditions (location, size, habitat and appropriate management), it is possible that coastal birds will exploit new sites or refuges. The important factors to consider in the creation of new sites or refuges for this purpose have been identified in the Solent Waders and Brent Goose Strategy (2010). Any replacement habitat must be subject to meeting the tests of the Habitats Regulations. Advice must also be sought from Natural England as to the most appropriate course of action on a case-by-case basis. Where a negative impact upon an important site cannot be avoided or mitigated, or appropriate replacement habitat is not or cannot be provided, the proposal will be refused.
- 1.55. Where data on sites of 'important' or 'uncertain' value is limited or out of date, site surveys should be undertaken to determine their level of importance. The authority recommends that the survey methodology set out in the Solent Waders and Brent Geese Strategy (2010) is followed. Appropriate methodologies should be approved by a professional ecologist and prepared in consultation with Natural England. For surveys to be considered valid, reasonable measures should be taken not to reduce the site's suitability for Brent Geese and waders during the survey period. In all cases, three consecutive years of recent survey data should ideally be carried out across the overwintering seasons and a record of any sightings on or adjacent to the application site will be required. Existing records for Brent Geese and wading bird species in Langstone Harbour are held by the Hampshire Biodiversity Information Centre, and records for Chichester Harbour are held by the Chichester Harbour Conservancy.
- 1.56. The Allocations Plan has been subject to an Appropriate Assessment under the Habitats Regulations, to help identify any potential negative impacts on the European wildlife sites, and means to avoid or mitigate such impacts, including those to the network of Brent Geese and wader sites outside of the SPAs. This forms part of the evidence base. It is considered that this policy provides sufficient flexibility to allow allocated sites that are designated as 'uncertain' sites for Brent Geese and/or waders to come forward for development within the plan period.

East Hampshire District Council Local Plan: Joint Core Strategy (2014)

- 1.57. The Joint Core Strategy is the current Local Plan for East Hampshire, created as a joint effort between East Hampshire District Council and the South Downs National Park Authority. It was adopted in 2014 and replaced the previous 2006 local plan. A new draft local plan is due to be adopted by the end of 2020, this follows the Governments legal requirements introduced in 2018 that local plans must be reviewed every five years. The South Downs National Park have subsequently adopted a separate local plan in 2019 (as discussed below)
- 1.58. Policies within the Joint Core Strategy that are relevant to the Ecological Impact Assessment are:
[Policy CP21 Biodiversity](#)
- 1.59. This policy refers to the need to maintain, enhance and protect district-wide biodiversity. The policy specifically refers to the requirement for new development to:
 1. Protect designated sites including those of international, national and local importance;
 2. Protect other features which are of local value for wildlife with examples listed including hedgerow, important trees and river corridors;
 3. Contribute towards district wide network of local sites;
 4. Ensure net gains in biodiversity and ensuring adverse impacts are avoided or mitigated for; and
 5. Protect and strengthen populations of legally protected species.
[Full CP21 Text](#)
- 1.60. Development proposals must maintain, enhance and protect the District's biodiversity and its surrounding environment.
- 1.61. New development will be required to:

- a) maintain, enhance and protect district wide biodiversity, in particular the nature conservation designations (see Map 2).
- i) Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar (International);
- ii) Sites of Special Scientific Interest (SSSI) and National Nature Reserves (National);
- iii) Sites of Importance for Nature Conservation (SINC) (Hampshire) and Local Nature Reserves (LNR).
- b) extend specific protection to, and encourage enhancement of, other sites and features which are of local value for wildlife, for example important trees, rivers, river corridors and hedgerows, but which are not included in designated sites.
- c) contribute towards maintaining a district-wide network of local wildlife sites, wildlife corridors and steppingstones between designated sites and other areas of biodiversity value or natural green space. This will help to prevent the fragmentation of existing habitats and allow species to respond to the impacts of climate change by making provision for habitat adaptation and species migration. This is supported by Policy CP28 (Green Infrastructure) and the District's Green Infrastructure work.
- d) ensure wildlife enhancements are incorporated into the design to achieve a net gain in biodiversity by designing in wildlife and by ensuring that any adverse impacts are avoided where possible or, if unavoidable, they are appropriately mitigated for, with compensatory measures only used as a last resort.
- e) protect and, where appropriate, strengthen populations of protected species;

Policy CP22 Internationally Designated Sites

- 1.62. This policy specifically states that any development within 400m of the Wealden Heaths Phase II SPA will be required to undertake a project specific Habitats Regulations Assessment. The policy requires that development complies with the findings of any forthcoming work provided by the Solent Disturbance and Mitigation Project in relation to the Solent SAC, SPA and Ramsar sites.

Policy CP28 Green Infrastructure

- 1.63. This policy states that Development will be permitted provided that it maintains, manages and enhances the network of new and existing green infrastructure. Development will need to take forward the objectives and priorities presented in the District's Green Infrastructure Study and Strategy, the South Hampshire Green Infrastructure Strategy and its Implementation Framework and the avoidance and mitigation measures set out in the Joint Core Strategy's Habitats Regulations Assessment. Account will also need to be taken of other relevant joint core strategy policies such as landscape, historic environment, biodiversity, flood risk and design. New green infrastructure must be provided either through on-site provision or financial contributions. The size of contribution will be linked to the scale of the development and the resulting new green infrastructure must be located as close as possible to the development it is intended to serve.

Local Planning Policy (Draft to be adopted)

Havant Borough Council Local Plan 2036 – Pre-submission Draft (2019)

- 1.64. The Havant Borough Council's Local Plan 2036 is currently in draft form and will replace the core strategy (see 11.2.6) It is hoped the Local Plan will be formally adopted in 2020. The Plan sets out the council strategic development vision up to 2036. Policies within the Draft Local Plan that are relevant to the Ecological Impact Assessment are:

KP9 Havant Thicket Reservoir:

- 1.65. The specific points which relate directly to ecology include the requirement that the natural character is conserved in particular by;
1. Limiting impacts on biodiversity including the creation of additional habitats;
 2. Compensating for the loss of, and effects on, Sites of Importance for Nature Conservation (SINCs);
 3. Ensuring that the pipeline avoids Great Copse, which should be protected during construction;
 4. Integrating the reservoir into the existing landscape of the area;
 5. Minimising the loss of ancient woodland and trees;

6. Appropriate mitigation measures, including buffers, are put in place for Bechstein's bat in line with Policy E15;
7. The potential impacts on the Langstone and Chichester Harbours as well as the Hermitage Stream have been assessed under the appropriate regulations and any necessary avoidance and mitigation measures included in the scheme design;
8. Opportunities for biodiversity enhancements associated with the reservoir and the Hermitage Stream are realised wherever possible; and
9. Opportunities arising from the new pipe works are taken to enhance the habitats along the stream corridors.

- 1.66. The emerging 2036 Local Plan contains three other policies which are relevant to ecology, E14, E15 and E18.

E14 The Local Ecological Network

- 1.67. Policy E14 relates to the local ecological network and states that planning permission will only be granted where:
1. The development avoids fragmentation of the Local Ecological Network;
 2. The applicant has identified and assessed the level of ecological value of the site through adequate and proportionate information and any matters arising have been addressed through an avoidance or mitigation plan; and
 3. Any necessary mitigation plan includes provision for ongoing management and maintenance.
- 1.68. The policy also includes reference to international, national and local nature conservation designations. Developments which have the potential to have an impact international sites should be supported by a Habitat Regulations Assessment and, if necessary, an Appropriate Assessment. Where developments are likely to have an adverse effect in the integrity of an international sites necessary avoidance or mitigation should be secured.
- 1.69. Nationally designated sites should not be adversely impacted by developments, with exceptions made where the benefit clearly outweighs the impact on the feature. In this instance mitigation and / or compensation should be secured to offset likely impacts.
- 1.70. Planning permission will only be granted on or adjacent to locally designated sites where the value of locally designated sites should be retained, and where possible enhanced through avoidance and / or mitigation measures, or the benefit of the development can be clearly shown to outweigh the conservation value of the site.

E15 Protected Species

- 1.71. Development proposals that are likely to affect protected species should be supported by appropriate surveys to establish their presence / likely absence. Where protected species are recorded impacts on these species should be avoided in the first instance. Where avoidance cannot be achieved planning applications should be supported by a mitigation or compensation plan, and a monitoring and review plan.
- 1.72. Bechstein's bat is specifically referenced in Policy E15, and the following wording is included:
- 1.73. *'In instances where Bechstein's bat is likely to be found onsite and/or nearby, survey methods appropriate to Bechstein's bat must be used and undertaken by a suitably qualified ecologist. If the presence of Bechstein's bat is established onsite and/or nearby, planning permission will only be granted where*
1. *Impacts on Bechstein's bat breeding habitat (i.e. net loss of/excessive disturbance to woodland or trees containing roosts) are avoided;*
 2. *Proposals include appropriate buffers to woodlands, trees, hedgerows and other flight corridors, considering the location of roosts and foraging/commuting habitats; and*
 3. *Review and monitoring plans are put in place.'*

E18 Trees, hedgerows and woodland

- 1.74. The points in this policy relevant to this assessment include the requirement to adequately protect existing trees and hedgerows during construction. The requirement of developments to have no loss or deterioration of ancient woodland and ancient or veteran trees. Provision is made to override

these requirements in the event that the need, and benefits of a development in the specific location clearly outweigh the impact of the development.

East Hampshire District Council Draft Local Plan 2017-2036 (2019)

- 1.75. East Hampshire District Council have produced a new draft Local Plan which is due to be adopted by the end of 2020. The Plan sets out the Council's strategic development vision up to 2036. Policies within the Draft Local Plan that are relevant to the Ecological Impact Assessment are:
 - 1.76. Policy DM25 The Local Ecological Network
 - 1.77. This policy refers to the importance of ecological networks and biodiversity and promotes coherent networks which provide more resilience to current and future pressure. The policy specifically refers to:
 1. EHDC refusing permission for developments which result in harm to the local ecological network, unless it can be proven that the need and benefits of the development will outweigh the harm. Where harm cannot be avoided measures, which mitigate or compensate for the harm will be required.
 2. Applications for developments must include adequate and proportionate information to assess the implications of a scheme on the ecological network. They must also be supported by mitigation and / or compensation plans which will deliver a net-gain for biodiversity and which set out the long-term management of any measures.
- Policy DM26: Trees, hedgerows and woodland**
- 1.78. This policy is mainly related to protection and retention of woody vegetation. Particularly relevant points include that planning permission will not be granted for schemes that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and ancient or veteran trees, unless the need for, and benefits of, the development clearly outweigh the loss, and adequate mitigation and compensation measures can be agreed with the Local Planning Authority.

Policy S22: Solent Special Protection Areas

- 1.79. This policy specifically relates to the potential impact of residential developments in relation to the Solent European Sites (See Chapter B). Planning permission will only be granted where an Appropriate Assessment concludes that there would be no adverse effects on the integrity of the Solent SPAs.

Policy S23 Green Infrastructure

- 1.80. The incorporation and development of green infrastructure within developments is encouraged to follow the East Hampshire District Council Green Infrastructure Strategy. Where green infrastructure is included within a development, suitable arrangements for future funding, maintenance and management should be in place.

Policy S31: Havant thicket reservoir

- 1.81. The scheme should conserve natural and rural character in particular by:
 1. Limiting impacts on biodiversity including the creation of additional habitats;
 2. Compensating for the loss of, and effects on, Sites of Importance for Nature Conservation (SINCs), the listed park and conservation area;
 3. Enhancing adjacent sites of importance for nature conservation;
 4. Minimising the loss of ancient woodland and trees.
 5. Opportunities for biodiversity enhancements associated with the reservoir are realised wherever possible.

Methodology

Desk Study Data Sources

- 1.82. The geographical area for obtaining ecological data through desk studies has been determined using professional judgement. Baseline data has been gathered from a range of sources through data requests, consultation, and using online resources as outlined below. This included data gathering in relation to statutory and non-statutory designated sites for nature conservation and

protected and priority species. The study areas used for the data gathering are detailed in Table 1 - Desk Study Ecological Zone of Influence (EZoI) The desk study was undertaken on 4 May 2020. For species records collected, only those within 10 years of the data collection date have been considered within the assessment.

- 1.83. The Hampshire Biodiversity Information Centre (HBIC) and Sussex Biodiversity Record Centre (SxBRC) were contacted in May 2020 for records no older than 10 years (circa 2009).
- 1.84. The following data was requested from HBIC and SxBRC in May 2020:
 - Records of non-statutory designated sites for nature conservation (Local Wildlife Sites (LWSs), Sites of Importance for Nature Conservation (SINCs) and Sites of Interest for Nature Conservation (SINCs));
 - Records of priority habitats and legally protected and priority flora;
 - Records of all bat species within 3 km of the Site;
 - Records of bat roosts within 5 km of the Site;
 - Records of Bechstein's bat and barbastelle bats within 10 km of the Site;
 - Protected and Priority habitats and species and invasive non-native plant species within 1 km of the Site; and,
 - Notable species including species considered of note by recorders for local areas or particular species groups.
- 1.85. Ancient and veteran tree records within 50 m of the Site were sourced from the Woodland Trust public accessible ancient tree inventory website² in May 2020.
- 1.86. The Multi-Agency Geographic Information for the Countryside (MAGIC) online resource was reviewed on several occasions with the latest review in May 2020 to establish the following:
 - The location of statutory designated sites for nature conservation; Special Protected Areas (SPAs and pSPAs), Special Areas of Conservation (SACs and pSACs), Wetlands of International Importance (Ramsar sites), Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs);
 - Ancient woodland; and,
 - European Protected Species Mitigation Licences (EPSMLs).
- 1.87. Ordnance Survey maps and the Grid Reference Finder website (<https://gridreferencefinder.com/>) were used to clarify the presence of waterbodies that have previously been recorded by ECOSA³ and to check for any additional waterbodies within 500 m of the Application Site boundary. The presence and location of waterbodies within 500 m of the Site have been used to establish if the land within and immediately surrounding the Site could be used as terrestrial habitat for great crested newt. This species typically uses suitable terrestrial habitat up to 500 m from a breeding pond. However, there is a notable decrease in great crested newt abundance beyond a distance of 250 m from a breeding pond⁴.

Results

Statutory Designated Sites

- 1.88. There are no statutory designated sites for nature conservation located within the Site.
- 1.89. There are three SACs with bats listed as a reason for designation within 30 km of the Site, these are:
 - Singleton and Cocking Tunnels SAC located approximately 15.7 km east of the Site;
 - Bridesford Copses SAC located 20 km south of the Site but is located on the Isle of Wight and separated from the mainland by the Solent, (approximately 6 km of open sea water); and,

² <https://ati.woodlandtrust.org.uk/tree-search/?v=1693508&ml=map&z=16&nwLat=50.878633181474946&nwLng=-0.9931598476358383&seLat=50.873623466042936&seLng=-0.9660588077493637>

³ Havant Thicket Winter Storage Reservoir, Rowland's Castle, Hampshire, Ecological Impact Assessment Report, Chapter K, Great Crested Newt Assessment

⁴ Natural England (2004) An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt (ENRR576). <http://publications.naturalengland.org.uk/publication/134002>.

- Ebernoe Common SAC is located approximately 29 km east of the Site.
- 1.90. The closest statutory designated sites within 5 km of the Site where there is a hydrological connection to the Site, via the Riders Stream and Hermitage Stream, is the Chichester and Langstone Harbours SPA and Ramsar site, and Solent Maritime SAC. These statutory designated sites are located approximately 1 km downstream from the Site at Bedhampton and Havant Springs (the pumping site and most southerly point of the pipeline) and approximately 3.85 km from the Reservoir Site. These sites are also the closest international sites to the Site.
- 1.91. The Solent and Dorset Marine Coast SPA is located approximately 4.2 km south west from the Pipeline Corridor. The nearest point of the SPA is within Portcreek Junction.
- 1.92. The Solent and Isle of Wight Lagoon SAC includes fourteen coastal lagoons; Shut Lake is the nearest lagoon to the Site. Shut Lake is located approximately 5 km west of the Site at Bedhampton and Havant Springs (the pumping site and most southerly point of the pipeline).
- 1.93. There are two SSSIs within 2 km of the Site; Langstone Harbour SSSI is located approximately 1 km south of the Pipeline Corridor and Chichester Harbour SSSI is located approximately 2 km south east of the Pipeline Corridor.
- 1.94. There are three LNRs located within 2 km of the Site. Hazelton Common LNR is located approximately 890 m north west of the Reservoir Site, Farlington Marshes LNR is located approximately 1.6 km south west of the Pipeline Corridor and Dell Piece West LNR is located approximately 1.8 km north west of the Reservoir Site.
- 1.95. There are no National Nature Reserve's (NNR's) within 2 km of the Site.
- 1.96. The statutory designated sites discussed above are detailed in Table 2 and shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0024. in Appendix A

Table 2 - Statutory Designated Sites

Site Name	Grid Ref	Area	Distance from Site	Description
Singleton and Cocking Tunnels SAC	SU872140	1.88 ha	15.7 km east of the Reservoir Site	The SAC is two disused railways tunnels, which are home to hundreds of hibernating bats in the winter. Species recorded hibernating include barbastelles and greater horseshoe bats along with the sole remaining greater mouse-eared bat colony in Britain. The site is also important for bats in the autumn where large numbers congregate to swarm which includes mating.
Briddlesford Copses SAC	SZ548906	165.44 ha	20 km South	The Briddlesford Copse complex of woodlands represents the most varied, structurally diverse and species-rich cluster of ancient broadleaved woodland on the Isle of Wight and supports an important breeding population of the rare Bechstein's bat. The bats use holes and crevices in mature trees for roosting and the interconnecting woodlands for feeding.
Ebernoe Common SAC	SU975271	234.93 ha	29 km east of the Reservoir Site	The SAC is a complex of woodlands featuring both barbastelle and Bechstein's bat maternity roosts. Sites with maternity roosts are important as these are where female bats come together in the late spring and summer to give birth to and raise

Site Name	Grid Ref	Area	Distance from Site	Description
				their young and are therefore critical to the conservation of the species.
Chichester and Langstone Harbours Ramsar Site	SU740019	5,810 ha	3.85 km south of the Reservoir Site and 1 km south of the Pipeline Corridor	Two large estuarine basins linked by the channel which divides Hayling Island from the main Hampshire coastline. The site includes extensive intertidal mudflats, saltmarsh, sand and shingle spits and sand dunes. The mudflats support beds of <i>Zostera</i> and <i>Enteromorpha</i> , whilst the lower saltmarsh is dominated by common cordgrass. Although many areas bordering the site have been developed, some grassland and brackish/freshwater marshes with reedbeds remain. Peak counts of wintering water birds regularly exceed 20,000 individuals, including internationally important numbers ⁵ .
Chichester and Langstone Harbours SPA	SU703053	5810.95 ha	3.85 km south of the Reservoir Site and 1 km south of the Pipeline Corridor	Chichester and Langstone Harbours SPA covers two large, estuarine basins. Urban development surrounds the west of Langstone Harbour, whereas farmland surrounds the majority of Chichester Harbour. Together, with neighbouring Portsmouth Harbour, the area forms one of the most sheltered intertidal areas on the South Coast of England. Both Chichester and Langstone Harbours contain extensive intertidal mudflats and sandflats with areas of seagrass beds, saltmarsh, shallow coastal waters, coastal lagoons, coastal grazing marsh and shingle ridges and islands. These habitats support internationally and nationally important numbers of overwintering and breeding bird species ⁶ .
The Solent Maritime SAC	SU703053	11,243.12 ha	3.85 km south of the Reservoir Site and 1 km south of the Pipeline Corridor	The Solent encompasses a major estuarine system on the south coast of England with four coastal plain estuaries (Yar, Medina, King's Quay Shore, Hamble) and four bar-built estuaries (Newtown Harbour, Beaulieu, Langstone Harbour and Chichester Harbour). The site is the only one in the series to contain more than one physiographic sub-type of estuary and is the only cluster site. The Solent and its inlets are unique in

⁵ <https://rsis.ramsar.org/ris/378>

⁶ <https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9011011&HasCA=1&NumMarineSeasonality=18&SiteNameDisplay=Chichester%20and%20Langstone%20Harbours%20SPA#SiteInfo>

Site Name	Grid Ref	Area	Distance from Site	Description
				Britain and Europe for their hydrographic regime of four tides each day, and for the complexity of the marine and estuarine habitats present within the area. Sediment habitats within the estuaries include extensive estuarine flats, shingle spits, and natural shoreline transitions. The mudflats range from low and variable salinity in the upper reaches of the estuaries to very sheltered almost fully marine muds in Chichester and Langstone Harbours ⁷ .
The Solent and Isle of Wight Lagoon SAC	SZ332940	37.93 ha	3 km north east of the Pipeline Corridor	The Lagoon SAC encompasses a series of lagoons on the south coast of England, located in the marshes at Keyhaven – Pennington area, at Farlington Marshes in Langstone Harbour, behind the sea-wall at Bembridge Harbour and at Gilkicker, near Gosport.
Solent and Dorset Coast SPA	SU669041	89,078.02 ha	4.2 km south of the Pipeline Corridor at the nearest point of the SPA within Portcreek Junction	The SPA protects important foraging areas at sea used by qualifying interest features from colonies within already classified SPAs. These qualifying interest features are three species of tern: common tern, Sandwich tern and little tern ⁸ . Chichester and Langstone Harbour SPA is one of the four, adjacent, already existing SPA's within the greater Solent where qualifying features will be subject to further protection from the Solent and Dorset SPA due to the inclusion of sub-tidal areas not currently encompassed in the existing SPAs. The landward boundary is set at Mean Low Water (MLW) where it abuts any existing SPA which has terns as existing features to avoid overlapping sites so as to afford the birds protection within the intertidal areas which are used for foraging. The site covers all the waters of the Solent, Southampton Water, Portsmouth Harbour, Christchurch Harbour, Poole Bay and also stretches along the Sussex Coast
Langstone Harbour SSSI	SU704053	2,085 ha	3.85 km south of the Reservoir Site	Langstone Harbour is a tidal basin which at high water resembles an almost landlocked lake. At low water

⁷ <https://sac.jncc.gov.uk/site/UK0030059>

⁸ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/560623/solent-dorset-summary.pdf

Site Name	Grid Ref	Area	Distance from Site	Description
			and 1 km south of the Pipeline Corridor	extensive mud flats are exposed, drained by three main channels which unite to make a common and narrow exit to the sea. The harbour includes one of the largest areas of mixed saltmarsh on the south coast, and extensive common cordgrass marsh in an advanced state of degeneration. The SSSI includes Farlington Marshes, a peninsula of grassland and marsh on reclaimed tidal silt protected by a sea wall; and a similar but much smaller area at Southmoor in the north-east of the harbour. The harbour is of international importance as a rich intertidal system supporting high densities of intertidal invertebrates and large populations of migrant and overwintering waders and wildfowl, dependent upon them and upon the extensive beds of eelgrass⁹.
Chichester Harbour SSSI	SU721051	3,733 ha	2 km south east of the Pipeline Corridor	Chichester Harbour is a large estuarine basin in which at low tide extensive mud and sandflats are exposed, drained by channels which unite to make a common exit to the sea. The site is of particular significance for wintering wildfowl and waders and also breeding birds both within the Harbour and in the surrounding permanent pasture fields and woodlands. There is a wide range of habitats which have important plant communities ¹⁰ .
Hazleton Common LNR	SU703119	17.44 ha	944 m north west of the Reservoir Site	Designated for supporting ancient woodland plant species and a range of butterfly species including Essex skipper small skipper grizzled skipper. Good breeding populations of stonechat are present and the common provides habitat for kestrel sparrow hawk and buzzard. The main pond supports great crested newt.
Dell Piece West LNR	SU700126	4 ha	1.7 km north west of the Reservoir Site	Designated for supporting a range of habitats including well wooded borders, unimproved grassland, damp marshy ground and a large shallow pond. These features provide habitat for a rich variety of wildlife that includes various butterflies, dragonflies and reptiles.

⁹ <https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1001182>

¹⁰ <https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1003245>

Site Name	Grid Ref	Area	Distance from Site	Description
Farlington Marshes LNR	SU689054	125 ha	1.6 km south west of the Pipeline Corridor	Farlington Marshes is 125 ha (308 acres) of flower-rich grazing marsh on the northern shore of Langstone Harbour between Portsmouth and Havant. Farlington is internationally important for the bird populations that it supports, as well as being a blaze of colour in spring and summer with many flowers and butterflies ¹¹ .

Non-Statutory Designated Sites

- 1.97. HBIC provided records of 80 Sites of Importance for Nature Conservation (SINCs) within 2 km of the Scheme, which include 60 SINCs within 2km of the Reservoir site and 65 SINCs within 2 km of the pipeline corridor. The SINCs listed in Table 3 - Non-Statutory Designated Sites within , (below) are SINCs within and immediately adjacent to the reservoir site and pipeline corridor.
- 1.98. SxBRc provided one non-statutory designated site within 2 km of the Site. This is Stanstead Forest LWS, located approximately 1.2 km east of the Site.
- 1.99. Of the 80 SINCs within 2 km of the Scheme; eight are within the Reservoir Site and seven are located immediately adjacent to the Reservoir Site. These are listed in Table 3.
- 1.100. There are three SINCs within the Pipeline Corridor, these are Thicket Lawn SINC, High Lawn SINC and Great Copse Havant SINC. These are listed in Table 3.
- 1.101. SINCs within and immediately adjacent to the Site are listed in Table 3 and non-statutory designated sites for nature conservation, located within 2 km are shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0025 in Appendix B.

Table 3 - Non-Statutory Designated Sites within and adjacent to the Site

Site Name	Grid Ref	Area (ha)	Distance from Site	Description
Thicket Bottom (SINC)	SU71950936	7.88 ha	Within Reservoir Site and 275 m east of the Pipeline Corridor	Pasture woodland and wooded commons, which are of considerable biological and historical interest (Criteria ¹² 1D). Situating within and adjacent to the Site along the southern boundary. Within the Site this SINC includes the Eastern side of The Avenue.
Thicket Bottom Woods and Lake (SINC)	SU71900930	15.71 ha	Within Reservoir Site and immediately east of the Pipeline Corridor	Situating within and adjacent to the Site along the southern boundary and designated for supporting ancient semi-natural woodland. Within the Site this SINC includes the western side of The Avenue and Round Wood.
Middle Clearing (SINC)	SU71250960	2.18 ha	Within Reservoir Site and 170 m north east of the Pipeline Corridor	Ancient semi-natural woodlands (Criteria 1A); and, Sites which support one or more notable species (Criteria 6A).

¹¹ <https://designatedsites.naturalengland.org.uk/SiteLNRDetail.aspx?SiteCode=L1008890>

¹² Criteria information throughout Table 3 is copied from:

Hampshire County Council Criteria for selecting Sites of Importance for Nature Conservation in Hampshire (in partnership with English Nature and Hampshire and Isle of Wight Wildlife Trust): <https://documents.hants.gov.uk/biodiversity/SINCCriteria.pdf>

Site Name	Grid Ref	Area (ha)	Distance from Site	Description
Havant Thicket (SINC)	SU71501050	96 ha	Within Reservoir Site and 1 km north of the Pipeline Corridor	Other woodland where there is a significant element of ancient semi-natural woodland surviving (Criteria 1B); Other semi-natural woodland if; (ii) they comprise important community types of restricted distribution in the County, such as yew woods and alder swamp woods (Criteria 1Cii); Pasture woodland and wooded commons, which are of considerable biological and historical interest (Criteria 1D); Semi-improved grasslands which retain a significant element of unimproved grassland (Criteria 2B); Areas of heathland which are afforested or have succeeded to woodland if; (i) they retain significant remnants of heathland vegetation which would enable their recovery (Criteria 3Bi); Fens, flushes, seepages, springs, inundation grasslands etc. that support a flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions (Criteria 5B); and, Sites which support one or more notable species (Criteria 6A). Notable species supported by the site include purple emperor silver-washed fritillary. Protected Species include Bechstein's bat.
Havant Thicket South West Corner (SINC)	SU71001050	8.51 ha	Within the Reservoir Site and 1.3 km north west of the Pipeline Corridor	Other woodland where there is a significant element of ancient semi-natural woodland surviving (criteria 1B); and, Areas of heathland which are afforested or have succeeded to woodland if; (i) they retain significant remnants of heathland vegetation which would enable their recovery (Criteria 3Bi)

Site Name	Grid Ref	Area (ha)	Distance from Site	Description
Bell's Copse (SINC)	SU70501010	33.28 ha	Within the Reservoir Site and 985 m north west of the Pipeline Corridor	Ancient semi-natural woodlands (criteria 1A); Other woodland where there is a significant element of ancient semi-natural woodland surviving (criteria 1B)
Cabbagefield Row (SINC)	SU70700950	2.03 ha	Within the Reservoir Site and 725 m north west of the Pipeline Corridor	Ancient semi-natural woodlands (Criteria 1A)
Idsworth Common (SINC)	SU71901100	15.91 ha	Within the Reservoir Site and 1.7 km north east of the Pipeline Corridor	Other woodland where there is a significant element of ancient semi-natural woodland surviving (criteria 1B); Pasture woodland and wooded commons, which are of considerable biological and historical interest (Criteria 1D; and, Sites which support one or more notable species: Bechstein's bat (Criteria 6A).
Thicket Lawn (SINC)	SU71600900	10.56 ha	Within the Pipeline Corridor. Immediately adjacent and south of Reservoir Site, in Staunton Country Park (SCP)	Semi-improved grasslands which retain a significant element of unimproved grassland (Criteria 2B); and, Fens, flushes, seepages, springs, inundation grasslands etc. that support a flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions (Criteria 5B).
High Lawn (SINC)	SU71900890	11.74 ha	Within the Pipeline Corridor 320 m south of Reservoir Site, within SCP	Semi-improved grasslands which retain a significant element of unimproved grassland (Criteria 2B); and, Fens, flushes, seepages, springs, inundation grasslands etc. that support a flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions (Criteria 5B).
Great Copse (SINC)	SU71800840	5.70 ha	Within the Pipeline Corridor and 505 m south of Reservoir Site	Ancient semi-natural woodlands (Criteria 1A)
Hammonds Lands Copse (SINC)	SU72300940	7.63 ha	Immediately adjacent and south of Reservoir Site, in SCP and 440 m east of the Pipeline Corridor	Ancient semi-natural woodlands (Criteria 1A)

Site Name	Grid Ref	Area (ha)	Distance from Site	Description
Blendworth Common (North) (SINC)	SU70801100	8.37 ha	Immediately adjacent and north west of Reservoir Site	Agriculturally unimproved grasslands (Criteria 2A)
Blendworth Common (South) (SINC)	SU70701070	19.18 ha	Immediately adjacent and north west of Reservoir Site and 1.4 km north west of the Pipeline Corridor	Agriculturally unimproved grasslands (Criteria 2A)
Dunsbury Hill Grassland 2 (SINC)	SU70620969	3.51 ha	Immediately adjacent and west of Reservoir Site	Semi-improved grasslands which retain a significant element of unimproved grassland (Criteria 2B)
Meadow by Bell's Copse (SINC)	SU70400990	4.94 ha	Immediately adjacent and west of Reservoir Site	Agriculturally unimproved grasslands (Criteria 2A); and, Grasslands which have become impoverished through inappropriate management but which retain sufficient elements of relic unimproved grassland to enable recovery (Criteria 2D)
The Holt (SINC)	SU72001150	127 ha	Immediately adjacent to the Reservoir Site and 1.7 km north east of the Pipeline Corridor	Ancient semi-natural woodlands (Criteria 1A); Areas of heathland which are afforested or have succeeded to woodland if; (i) they retain significant remnants of heathland vegetation which would enable their recovery (Criteria 3Bi); and, Sites which support one or more notable species (Criteria 6A). Protected species include: myotis bats, Bechstein's bat and the notable species: wild lettuce. Ancient and semi-natural woodland
Dunsbury Hill Wood (SINC)	SU70500960	6.70 ha	Immediately adjacent and west of Reservoir Site (north east access) and 935 m north west of the Pipeline Corridor	Other semi-natural woodland if; (ii) they comprise important community types of restricted distribution in the County, such as yew woods and alder swamp woods (Criteria 1Ci)

Irreplaceable Habitats

- 1.102. There are 33 ancient woodland sites within 2 km of the Site of which 22 are Ancient Semi Natural Woodlands (ASNWs) and 11 are Ancient Re-Planted Woodlands (PAWs). These are detailed in Table 4 and shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0036 in Appendix C.
- 1.103. There are eight ancient woodland sites within the Site, including four ASNWs; The Avenue, Middle Clearing, Round Wood, part of Bell's Copse, part of Cabbagefield Row and three PAWs, including the Forest of Bere (Havant Thicket), part of Bell's Copse and a site located within Staunton Country

Park (SCP) adjacent and south west of the Avenue at the Ordnance Survey Grid Reference (OSGR): SU705092.

- 1.104. Due to some uncertainty of the accuracy of the ancient woodland inventory Portsmouth Water commissioned an independent specialist to survey six plots of woodland in and adjacent to the Site. A copy of the Ancient Woodland Report is provided in Appendix D. The report was submitted to Natural England by Portsmouth Water in February 2020 and Natural England's Response (April 2020) is provided in Appendix E.

Table 4 - Ancient Woodland within 2 km

Site Name	Grid Ref	Area (ha)	Distance from Site	Description
The Avenue	SU71950936	14.52 ha	Within the Reservoir Site	ASNW
Middle Clearing	SU71250960	2.18 ha	Within the Reservoir Site	ASNW
Round Wood	SU71900930	1.98 ha	Within the Reservoir Site	ASNW
Staunton Country Park	SU70540921	1.66 ha	Within the Site; the south western corner of Staunton Country Park, to the south of the reservoir footprint, (part of the ecological enhancement area)	PAWS
Forest of Bere	SU71501050	98.99 ha	Within the Reservoir Site, (part of the ecological enhancement area)	PAWS
Bell's Copse	SU70581000	20.59 ha	Within the Reservoir Site, (part of the ecological enhancement area)	ASNW
Bell's Copse	SU70711031	9.33 ha	Within the Reservoir Site, (part of the ecological enhancement area)	PAWS
Cabbage field Row	SU70700950	2.04 ha	Within the Reservoir Site	ASNW
Hammonds Lands Copse	SU72300940	5.75 ha	Immediately adjacent and south of Reservoir Site, in SCP	ASNW
The Holt	SU72001150	126 ha	Immediately north east of the Reservoir Site	PAWS
Staunton Country Park	SU71980924	0.9 ha	75 m south of the Reservoir Site	ASNW
Waterlooville Golf Course	SU70341074	0.95 ha	171 m west of Bell's Copse and located west of the A3(M)	ASNW

Site Name	Grid Ref	Area (ha)	Distance from Site	Description
Waterlooville Golf Course	SU70221067	0.18 ha	200 m west of Bell's Copse and located west of the A3(M)	ASNW
Oaklands Woodland (SINC)	SU73100990	1.38 ha	400 m east of Reservoir Site	PAWS
Wakefords Copse	SU72400890	2.52 ha	440 m south of Reservoir Site	ASNW
Great Copse (SINC)	SU71800840	4.92 ha	505 m south of Reservoir Site	ASNW
Bushy Lease	SU69940848	2.87 ha	1.13 km south west	ASNW
Unnamed	SU70020830	0.13 ha	1.15 km south west and 872 m east of the pipeline	ASNW
Littlepark Wood	SU69470712	3.24 ha	1.18 km west of the pipeline	PAWS
Littlepark Wood	SU69580728	1.13 ha	1.18 km west of the pipeline	ASNW
The Queens inclosure	SU69491044	5.57 ha	1.2 km west of the Reservoir Site	ASNW
Unnamed	SU73360848	12.42	1.26 km south of the Reservoir Site and 1.33 km east of the Pipeline Corridor	ASNW
Unnamed	SU69930826	1.19 ha	1.26 ha south west 872 m east of the pipeline	ASNW
Emsworth Common, Blackbush Coppice	SU73720892	8.31 ha	1.43 km south east of the Reservoir Site and 1.7 km east of the Pipeline Corridor	ASNW
Emsworth Common, Blackbush Coppice	SU7880895	47.0 ha	1.43 km south east of the Reservoir Site and 1.7 km east of the Pipeline Corridor	PAWS
The Queens inclosure	SU69201040	31.89 ha	1.44 km west of the Reservoir Site	PAWS
Unnamed	SU69600841	5.75 ha	1.47 km south west and 1.2 km east of the pipeline	ASNW
Cherry Row	SU73501145	1.83 ha	1.55 km north east of the Reservoir Site	ASNW
Unnamed	SU69560820	0.49 ha	1.61 km south west and 826 m west of the pipeline	PAWS
Unnamed	SU73811073	37.88 ha	1.62 km east of the Reservoir Site	PAWS

Site Name	Grid Ref	Area (ha)	Distance from Site	Description
Emsworth Common, Blackbush Coppice	SU74210960	2.06 ha	1.87 km south east of the Reservoir Site and 1.7 km east of the Pipeline Corridor	ASNW
Emsworth Common, Blackbush Coppice	SU74390914	4.8 ha	1.95 km south east of the Reservoir Site and 1.7 km east of the Pipeline Corridor	PAWS
Lyels Wood	SU74601032	21.97 ha	1.95 km east of the Reservoir Site	ASNW

Veteran Trees

- 1.105. A search for veteran and notable trees within 50 m of the Site using the Woodland Trusts, ancient tree inventory¹³ concluded that a single veteran tree is located within the Reservoir Site along the north eastern edge of Havant Thicket woodland Table at the OSGR: SU7190010814. A notable tree is located 50 m north of the Pipeline Corridor at the junction of Highway Lane and Dunsbury Way at the OSGR: SU7130308186. These are listed in Table 5 and shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0037 in Appendix F.

Table 5 - Veteran and Notable Trees within 50 m

Location OSGR of veteran / notable trees	Distance from Site	Description of tree	Importance level
SU7190010814 Along the north eastern edge of Havant Thicket woodland	Immediately east of the Reservoir Site (ecological enhancement area) boundary	Common yew, multi stem, standing, alive, girth: 3.96 m at a height of 0.20 m	Notable tree
SU7130308186	50 m north of the Pipeline Corridor at the junction of Highway Lane and Dunsbury Way	Apple, pollard lapsed, standing alive, girth: 1.53 m at a height of 0.50 m	Veteran

Priority Habitats

- 1.106. There are five priority habitat types recorded within 1 km of the Reservoir Site. These are detailed in Table 6. Three of these priority habitats are within the Reservoir Site including wood-pasture and parkland, within the Avenue Woodland, OSGR: SU717096, lowland dry acid grassland located in the south west corner of Havant Thicket Woodland at the OSGR: SU709104 and seven parcels of deciduous woodland, detailed in Table 6. These are shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0023 in Appendix G.

Table 6 - Priority Habitat within 1 km of the Reservoir Site

Priority Habitat	Total Number of Priority Habitat Areas within 1 km of the Reservoir Site	Approximate Nearest Priority Habitat to the Reservoir Site and Grid Ref Location
Lowland Dry Acid Grassland	3	One area located within the wider reservoir Site, within the South West Corner of Havant Thicket Woodland at the OSGR: SU70951042.

¹³ <https://ati.woodlandtrust.org.uk/tree-search/?v=1693512&ml=map&z=16&nwLat=50.87826078897203&nwLng=-0.9879456333108871&seLat=50.873995760963126&seLng=-0.9712730220743149>

		One area located within the wider reservoir site, in the northern extent of Bells Copse at the OSGR: SU708104. Large Area located immediately west of the northern access road on Blendworth common at the OSGR: SU708105.
Deciduous woodland	266	Seven areas of deciduous woodland are located within the Reservoir Site: The Avenue Woodland, OSGR: SU71770962, Middle Clearing Woodland, OSGR: SU71230961, Round Wood, OSGR: SU71460933, Havant Thicket woodland (made up of large separate woodland compartments), OSGR: SU71641095 Bell's Copse, OSGR: SU70630991 SCP, OSGR: SU71830939 and Cabbagefield Row SU708095
Wood-pasture and Parkland	4	Two areas located within the Reservoir Site. The Avenue woodland and deciduous woodland within SCP. Polygon ID: HTS_4495
Coastal and Floodplain Grazing Marsh	2	One area located adjacent to the northern access road, OSGR: SU715115 One area located approximately 40m South of the Reservoir Site on the banks of the Riders Stream at OSGR: SU71420902;
Lowland Meadow	1	One area located approximately 134 m south of the Reservoir Site within Staunton Country Park at the OSGR: SU72050926

- 1.107. The desk study identified three priority habitats within the pipeline corridor: wood-pasture and parkland (associated with Staunton Country Park), deciduous woodland (associated with Staunton Country Park and Great Copse) and coastal and floodplain grazing marsh (associated with the Hermitage Stream). Lowland meadow and mudflat habitats are also recorded within 1 km of the pipeline corridor. These are detailed in Table 7 along with other nearest priority habitats to the Pipeline Corridor and also shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0023 in Appendix G.

Table 7 - Priority Habitat within 1 km of the Pipeline Corridor

Priority Habitat	Total Number of Priority Habitat Areas within 1 km of the Reservoir Site	Approximate Nearest Priority Habitat to the Pipeline Corridor and Grid Ref Location
Coastal and Floodplain Grazing Marsh	37	One area located within the Pipeline Corridor between OSGRs: SU710072 (northerly point) and SU710068 (southerly point).
Wood-pasture and Parkland	1	One area located within the Pipeline Corridor where it passes through SCP at the OSGR: SU718088
Deciduous woodland	92	One area located within the Pipeline Corridor where it passes through the northern extent of Great Copse at the OSGR: SU718086.
Lowland meadow	1	The nearest area to the pipeline corridor is 580 m east, located within SCP.
Mudflats	5	The nearest area to the pipeline corridor is 400 m south and downstream (Hermitage Stream) of the Bedhampton and Havant Springs Pumping Site and most southerly point of the Pipeline Corridor at OSGR: SU703054

- 1.108. There are 36 waterbodies within 500 m of the Reservoir Site. These are detailed in Table 8. The nearest waterbody is the Upper Lake, located within the Avenue woodland on the Reservoir Site. Of these 36 waterbodies, there are 17 located in Havant Thicket woodland and two located within Bell's Copse woodland. These are shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0044 in Appendix H.

Table 8 - Waterbodies within 500 m of the Reservoir Site

Waterbody OSGR	Approximate distance and location to the Pipeline Corridor	Description
SU 71428 10021	Upper Lake is located within the reservoir site and located within The Avenue Woodland	Large pond (c.7,000 m ²)
SU 72239 10289	Within the Site (ecological enhancement area), located south east area of Havant Thicket Woodland	Small pond (c.130 m ²) within a group of ponds
SU 72245 10275	Within the Site (ecological enhancement area), located south east area of Havant Thicket Woodland	Small pond (c.20 m ²) within a group of ponds
SU 72230 10309	Within the Site (ecological enhancement area), located south east area of Havant Thicket Woodland	Medium sized pond (c.350 m ²), within a group of ponds
SU 72200 10286	Within the Site (ecological enhancement area), located south east area of Havant Thicket Woodland	Small pond (c.85 m ²), within a group of ponds
SU 72257 10299	Within the Site (ecological enhancement area), located south east area of Havant Thicket Woodland	Small pond (c.85 m ²), within a group of ponds
SU 72128 10433	Within the Site (ecological enhancement area), located south east area of Havant Thicket Woodland	Medium pond (c.580 m ²)
SU 72110 10460	Within the Site (ecological enhancement area), located south east area of Havant Thicket Woodland	Small pond (c.190 m ²)
SU 72130 10473	Within the Site (ecological enhancement area), located south east area of Havant Thicket Woodland	Medium pond (c.280 m ²)
SU 72106 10483	Within the Site (ecological enhancement area), located south east area of Havant Thicket Woodland	small pond (c.145 m ²)
SU 72079 10531	Within the Site (ecological enhancement area), located south east area (Long Wood) of Havant Thicket Woodland	small pond (c.150 m ²)
SU 72076 10569	Within the Site (ecological enhancement area), located south east area (Long Wood) of Havant Thicket Woodland	small pond (c.150 m ²)
SU 72051 110575	Within the Site (ecological enhancement area), located south east area (Long Wood) of Havant Thicket Woodland	Small pond (c.200 m ²)
SU 72052 10543	Within the Site, (ecological enhancement area), located south east area (Long Wood) of Havant Thicket Woodland	Medium pond (c.300 m ²)

Waterbody OSGR	Approximate distance and location to the Pipeline Corridor	Description
SU 72034 10532	Within the Site, (ecological enhancement area), located south east area (Long Wood) of Havant Thicket Woodland	Medium pond (c.250 m ²)
SU 72045 10513	Within the Site (ecological enhancement area), located south east area (Long Wood) of Havant Thicket Woodland	Medium pond (c.250 m ²)
SU 71505 10675	Within the Site (ecological enhancement area), located along central watercourse running through Havant Thicket	Medium pond (c.250 m ²)
SU 71451 10413	Within the Site (ecological enhancement area), located in the centre of Havant Thicket	Small pond (c.185 m ²)
SU 70342 09789	Within the Site (ecological enhancement area), located in Bell's Copse, west.	Small pond (c.60 m ²)
SU 70838 10314	Within the Site (ecological enhancement area), located in Bell's Copse	Small pond (15 m ²)
SU 72465 09546	Immediately East of the South east corner of the Site (Gipsies Plain)	Small pond (c.150 m ²)
SU 72400 09553	57 m south east of the Site	Small pond (c.230 m ²). Within Hammonds Lands Copse, located in SCP
SU 72430 09545	83 m south east of Site	Small pond (c.140 m ²)
SU 72420 09522	85 m south east of the Site	Small pond (c.30 m ²)
SU 72337 09466	88 m south east of Site boundary	Medium pond (670 m ²)
SU 72444 09542	105 m south east of Site boundary	Small pond (c.140 m ²)
SU 72459 09501	129 m south east of Site boundary	Small pond (c.150 m ²)
SU 72341 09421	128 m south east of Site boundary	Small pond (c.100 m ²)
SU 72442 09526	136 m south east of Site boundary	Small pond (c.75 m ²)
SU 72597 09536	222 m south east of the Site	South of Gipsies Plain within SCP Relatively large waterbody surrounded by woodland.
SU 71918 09122	224 m south of the Site	Staunton Country Park lake. Large fishing lake (c.15,000 m ²)
SU 72448 09364	233 m south east of the Site	South of Hammonds Lands Copse, located in Staunton Country Park
SU 71078 11349	250 m north, located on Blendworth Common	Small pond

Waterbody OSGR	Approximate distance and location to the Pipeline Corridor	Description
SU 71151 11483	320 m north, located on Blendworth Common	Located along a drainage ditch
SU 72536 09279	352 m south east of Site boundary	Very small pond (10 m ²),
SU 7254 0932	376 m south east of Site boundary	Garden pond

- 1.109. There are six waterbodies located within 500 m of the Pipeline Corridor. These are detailed in Table 9. However, all but one of these waterbodies are 250 m or more from the Pipeline Corridor. The waterbodies are also, separated by significant barriers to great crested newt movements, such as large expanses of housing and roads. The single waterbody located within 250 m comprises an open-air swimming pool, that appears to be used from study of satellite imagery¹⁴ and is considered to be unsuitable for great crested newt utilisation. These are shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0044 in Appendix H.

Table 9 - Waterbodies within 500 m of the Pipeline Corridor

Pond OSGR	Approximate distance and location to the Pipeline Corridor	Description
SU 71341 07257	140 m, east	Outdoor swimming pool associated with Trosnants Federation of Schools. Appears to be used from satellite imagery
SU 70578 07466	320 m, west	Two small ponds in the grounds of Bancroft Primary School
SU 70245 06338	320 m, south-west	Large pond linked to a system of running watercourses
SU 71828 09153	330 m, east	Staunton Country Park Lake
SU 70925 06128	430 m, south-east	Pond within close proximity to industrial buildings and roundabout along Brockhampton Road
SU 71134 08323	480 m, west	A small pond in the grounds of Riders Infant School

- 1.110. These waterbodies are consistent with those identified by ECOSA in the great crested newt survey report in Appendix A9.11.

Protected, Priority and Notable Species

Bats within 3 km of the Site

- 1.111. Many of the bat records obtained in the desk study are from surveys undertaken for this Scheme that have been provided to the local record centres. HBIC provided records of 13 species of bat within 3 km of the Reservoir Site of which 12 of these species are recorded within the Reservoir Site. These are detailed in Table 10 and shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0038 in Appendix I.

¹⁴ <http://openspace.nearby.org.uk/wheresthepath.htm>

Table 10 - HBIC Bat Records within 3 km of the Reservoir Site

Common Name	Total No of Records	Approximate Closest Record to Reservoir Site	Grid Ref
Bechstein's bat	23	Within the Site	SU715093
Brandt's bat	7	Within the Site	SU707096
Barbastelle	33	Within the Site	SU714114
Brown long-eared bat	105	Within the Site	SU714099
Common pipistrelle	31	Within the Site	SU715097
Daubenton's bat	6	Within the Site	SU715092
Noctule	180	Within the Site	SU718094
Nathusius's pipistrelle	32	Within the Site	SU715097
Natterer's bat	63	Within the Site	SU718094
Serotine	160	Within the Site	SU715097
Soprano pipistrelle	278	Within the Site	SU715097
Whiskered bat	34	Within the Site	SU723095
Alcathoe bat	1	1.8 km south east	SU733081

- 1.112. HBIC provided records of the same 13 species of bat within 3 km of the Pipeline Corridor with common pipistrelle, soprano pipistrelle and Nathusius's pipistrelle recorded within the Pipeline Corridor. These records are detailed in Table 11 and shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0039 in Appendix I.

Table 11 - HBIC Bat Records within 3 km of the Pipeline Corridor

Common Name	No of Records	Approximate Closest Record to the Pipeline Corridor	Grid Ref
Common pipistrelle	728	Within the Pipeline Corridor on the Hermitage Stream	SU708077
Nathusius's pipistrelle	48	Within the Pipeline Corridor at High Lawn Way	SU717083
Soprano pipistrelle	465	Within the Pipeline Corridor	SU710073
Noctule	196	Approximately 60 m east	SU711073
Serotine	192	Approximately 110m east	SU713073
Daubenton's bat	12	Approximately 240 m east within Staunton Country Park	SU715092
Bechstein's bat	81	Approximately 260 m north east (within the Reservoir Site, Round Wood)	SU715093
Natterer's bat	52	Approximately 520m north east (within the Reservoir Site)	SU718094
Whiskered bat	260	Approximately 520m north east (within the Reservoir Site)	SU718094
Barbastelle	35	Approximately 650m north (within the Reservoir Site)	SU715097

Brown long-eared bat	42	Approximately 655 m north (within the Reservoir Site)	SU715097
Alcathoe bat	2	1.4 km south east west	SU733081
Brandt's bat	5	Approximately 1.4 m south west	SU733081

- 1.113. SxBRC provided 48 records of bat species within 3 km of the (Reservoir Site,) including seven species of bat. These are described in Table 12 and shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0038 in Appendix I.

Table 12 - SxBRC Bat Records within 3 km of the Reservoir Site

Common Name	No of Records	Approximate Closest Record to Reservoir Site	Grid Ref
Brown long-eared bat	3	Approximately 1.8 km east	SU741109
Bechstein's bat	10	Approximately 1.8 km north east	SU741109
Whiskered bat	4	Approximately 1.8 km north east	SU741109
Serotine	2	Approximately 2.2 km east	SU753092
Noctule	1	Approximately 2.59 km south east	SU747085
Common pipistrelle	5	Approximately 3 km south east	SU753091
Soprano pipstrelle	6	Approximately 3 km south east	SU753091

Bat Roosts within 5 km of the Site

- 1.114. SxBRC provided records of 14 bat roosts within 5 km of the Site (Reservoir Site and Pipeline Corridor). These include bat roost records for Bechstein's bat, brown long-eared, common pipistrelle, Daubenton's bat, Natterer's bat, noctule, serotine and soprano pipistrelle. The nearest bat roost to the Reservoir Site is a Bechstein's bat roost located in Lyels Wood, approximately 2.2 km south east at the OSGR: SU748103. The nearest bat roost to the Pipeline Corridor is located approximately 2.9 km south east of the Pipeline Corridor at the OSGR: SU748079. These records are described in Table 13 and presented on Figures HTR-ATK-ZZ-ZZ-GS-Z-0040 and HTR-ATK-ZZ-ZZ-GS-Z-0041 in Appendix J.

Table 13 - SxBRC Records of Bat Roosts within 5 km of the Site

Common Name	Approximate Distance and location of Roost Record from the Reservoir Site and Pipeline Corridor	No of Records	Roost Type	Grid Ref
Bechstein's bat	2.2 km east of the Reservoir Site at Lyels Wood and 3.4 km north east of the Pipeline corridor.	1	Unspecified	SU748103
Bechstein's bat	3.0 km south east of the Reservoir Site and 3.17 km south east of the Pipeline Corridor. Unspecified roost site Hollybank Woods	1	Unspecified	SU751083
Bechstein's bat	3.0 km south east of the Reservoir Site and 2.9 km south east of the Pipeline Corridor. Roost site at Westbourne	1	Unspecified	SU748079
Bechstein's bat	3.1 km south east of the Reservoir Site, in fields south of Southleigh	1	Unspecified	SU751082

Common Name	Approximate Distance and location of Roost Record from the Reservoir Site and Pipeline Corridor	No of Records	Roost Type	Grid Ref
	Forest and 3.2 km south east of the Pipeline Corridor			
Bechstein's bat	3.1 km south east, in Southleigh Forest and 3.2 km south east of the Pipeline Corridor	1	Unspecified	SU751083
Brown long-eared bat	3.35 km east of the Reservoir Site and 4.3 km north east of the Pipeline Corridor (at the Garden Cottage)	1	Maternity	SU75971014
Serotine	3.35 km east of the Reservoir Site and 4.3 km north east of the Pipeline Corridor (at the Garden Cottage)	1	Maternity roost and feeding roost	SU75971014
Bechstein's bat	3.6 km east of the Reservoir Site and 4.6 km east of the Pipeline Corridor. Unspecified Roost site at Lyels Wood	1	Unspecified	SU762103
Soprano pipistrelle	3.6 km east of the Reservoir Site and 4.6 km north east of the Pipeline Corridor. Unspecified Roost Site at Lyels Wood	1	Maternity	SU762103
Common pipistrelle	3.93 km south east of the Reservoir Site and 3.75 km south of the Pipeline Corridor	1	Unspecified	SU754072
Daubenton's bat	3.93 km south east of the Reservoir Site and 3.75 km south of the Pipeline Corridor	1	Unspecified	SU754072
Natterer's bat	3.93 km south east of the Reservoir Site and 3.75 km south of the Pipeline Corridor	1	Unspecified	SU754072
Noctule	3.93 km south east of the Reservoir Site and 3.75 km south of the Pipeline Corridor	1	Unspecified	SU754072
Soprano pipistrelle	3.93 km south east of the Reservoir Site and 3.7 km south east of the Pipeline Corridor.	1	Unspecified	SU754072

- 1.115. HBIC provided 77 records of roost sites within 5 km of the Reservoir Site and of which there are 18 records of maternity roosts, of which there are five Bechstein's bat maternity roosts and one Serotine maternity roost. The nearest maternity roost to the Reservoir Site is a Bechstein's bat roost located immediately east and on the edge of The Holt at the OSGR: SU717113. Fifty-nine of the records are non-maternity roost sites, including Bechstein's bat, common pipistrelle, serotine, soprano pipistrelle and long-eared bat. Two Bechstein's bat roost were recorded within the Reservoir Site at the OSGRs: SU717094 and SU715093 and a soprano pipistrelle bat roost was recorded within the Reservoir Site at the OSGR: SU699110. These are described in Table 14 and presented on Figure HTR-ATK-ZZ-ZZ-GS-Z-0040 in Appendix J.

Table 14 - HBIC Records of Bat Roosts within 5 km of the Reservoir Site

Common Name	Approximate Distance and location of Maternity Roost Record from the Reservoir Site	No of Records	Roost type	Grid Ref
Bechstein's bat	Within the Site	1	Unspecified Roost	SU717094
Bechstein's bat	Within the Site	1	Unspecified Roost	SU715093
Soprano pipistrelle	Within the Site	1	Unspecified Roost	SU715097
Bechstein's bat	Immediately south in Staunton Country Park	4	Unspecified Roost	SU717092
Bechstein's bat	Immediately south in Staunton Country Park	4	Unspecified Roost	SU718092
Bechstein's bat	Immediately south in Staunton Country Park	4	Unspecified Roost	SU718093
Bechstein's bat	Immediately east within and on the edge of The Holt woodland	1	Maternity	SU717113
Bechstein's bat	Immediately south, in Staunton Country Park	1	Unspecified Roost	SU721093
Bechstein's bat	150 m east within The Holt woodland	1	Maternity	SU717115
Bechstein's bat	260 m north on the edge of The Holt woodland	1	Maternity	SU714117
Common pipistrelle	555 m east in Rowlands Castle	2	Unspecified Roost	SU730102
Bechstein's bat	720 m east within The Holt	2	Unspecified Roost	SU723116
Common pipistrelle	845 m south	1	Unspecified Roost	SU724087
Bechstein's bat	985 m north	1	Maternity	SU706120
Bechstein's bat	1 km north	1	Maternity	SU706121
Common pipistrelle	1 km north west	3	Unspecified Roost	SU699110
Soprano pipistrelle	1 km west	1	Unspecified Roost	SU699110
Pipistrelle	1.0 km west, (west of the A3 (M))	3	Unspecified Roost	SU699110
Common pipistrelle	1.2 km north	1	Unspecified Roost	SU709125
Common pipistrelle	1.3 km west	2	Unspecified Roost	SU696088
Long-eared bat	1.3 km east in Rowlands Castle	1	Unspecified Roost	SU735108
Serotine	1.6 km south	13	Maternity	SU713073

Common Name	Approximate Distance and location of Maternity Roost Record from the Reservoir Site	No of Records	Roost type	Grid Ref
Pipistrelle	1.4 km west, (west of the A3 (M))	1	Unspecified Roost	SU695109
Serotine	1.6 km south, (west of the A3 (M))	3	Unspecified Roost	SU713073
Bechstein's bat	1.6 km south east within Southleigh Forest	2	Unspecified Roost	SU737088
Pipistrelle	1.7 km north west, (west of the A3 (M))	1	Unspecified Roost	SU692114
Long-eared bat	1.9 km north	1	Unspecified Roost	SU708132
Pipistrelle	2.4 km north west, (west of the A3 (M))	2	Unspecified Roost	SU687120
Brown long-eared	2.7 km north west (west of the A3 (M))	1	Unspecified Roost	SU689127
Serotine	2.8 km north west, (west of the A3 (M))	1	Unspecified Roost	SU692133
Common pipistrelle	2.9 km south	1	Unspecified Roost	SU707060
Soprano pipistrelle	2.9 km south	1	Unspecified Roost	SU707060
Common pipistrelle	3 km west	1	Unspecified Roost	SU678089
Soprano pipistrelle	3.1 km	1	Unspecified Roost	SU726060
Common pipistrelle	3.8 km west	2	Unspecified Roost	SU668118
Brown long-eared	4.1 km west	2	Unspecified Roost	SU662095
Brown long-eared	4.5 km west	3	Unspecified Roost	SU659110
Common pipistrelle	4.5 km west	1	Unspecified Roost	SU659110
Soprano pipistrelle	4.5 km west	1	Unspecified Roost	SU659110
Brown long-eared	4.8 km west	2	Unspecified Roost	SU656110

HBIC provided 57 records of bat roosts within 5 km of the Pipeline Corridor, of these records 19 are maternity roosts. The nearest maternity roost to the Pipeline Corridor is located approximately 120 m east at the OSGR: SU713073. The nearest non-maternity roost to the Pipeline Corridor is located approximately 280 m north within the Reservoir Site. These are detailed in

1.116. Table 15 and presented on Figure HTR-ATK-ZZ-ZZ-GS-Z-0041 in Appendix J.

Table 15 - HBIC Records of Bat Roosts within 5 km of the Pipeline Corridor

Common Name	Approximate Distance and location of Roost Record from the Pipeline Corridor	No of Records	Roost type	Grid Ref
Serotine	120 m east of the Pipeline Corridor	13	Maternity	SU713073
Bechstein's bat	280 m north of the Pipeline Corridor (within the Reservoir Site)	1	Unspecified Roost	SU715093
Bechstein's bat	330 m east of the Pipeline Corridor within Staunton Country Park	4	Unspecified Roost	SU717092
Bechstein's bat	430 m east of the Pipeline Corridor within Staunton Country Park	4	Unspecified Roost	SU718092
Bechstein's bat	460 m east of the Pipeline Corridor, within Staunton Country Park	2	Unspecified Roost	SU718093
Bechstein's bat	475 m north east of the Pipeline Corridor (within the Reservoir Site)	1	Unspecified Roost	SU717094
Common pipistrelle	530 m east of the Pipeline Corridor	1	Unspecified Roost	SU724087
Soprano pipistrelle	650 m north east of the Pipeline Corridor (within the Reservoir Site)	1	Unspecified Roost	SU715097
Bechstein's bat	680 m north east of the Pipeline Corridor within The Holt	2	Unspecified Roost	SU723116
Pipistrelle sp.	715 m south east of Pipeline Corridor	1	Maternity	SU718067
Bechstein's bat	740 m east of the Pipeline Corridor, within Staunton Country Park	1	Unspecified Roost	SU721093
Bechstein's bat	1.5 km south east of the Pipeline Corridor	2	Unspecified Roost	SU737088
Common pipistrelle	1.7 km west of the Pipeline Corridor	2	Unspecified Roost	SU696088
Soprano pipistrelle	1.7 km south east of the Pipeline Corridor	1	Unspecified Roost	SU726060
Common pipistrelle	1.9 km north east of the Pipeline Corridor	2	Unspecified Roost	SU730102
Common pipistrelle	1.9 km south west of Pipeline Corridor where it enters the Bedhampton and Havant Sprints Pumping Site	2	Maternity	SU684058
Bechstein's bat	2.2 km north of Pipeline Corridor where it exits the Reservoir Site.	1	Maternity	SU717113
Common pipistrelle	2.4 km north west of the Pipeline Corridor, (west of the A3 (M))	3	Unspecified Roost	SU699110
Soprano pipistrelle	2.4 km north west of the Pipeline Corridor, (west of the A3 (M))	1	Unspecified Roost	SU699110
Pipistrelle sp.	2.4 km north west of the Pipeline Corridor, (west of the A3 (M))	3	Unspecified Roost	SU699110
Bechstein's bat	2.4 km north of Pipeline Corridor where it exits the Reservoir Site.	1	Maternity	SU717115

Common Name	Approximate Distance and location of Roost Record from the Pipeline Corridor	No of Records	Roost type	Grid Ref
Bechstein's bat	2.6 km north of Pipeline Corridor where it exits the Reservoir Site.	1	Maternity	SU714117
Pipistrelle sp.	2.6 km north west of the Pipeline Corridor, (west of the A3 (M))	1	Unspecified Roost	SU695109
Long-eared bat	2.7 km north east of the Pipeline Corridor	1	Unspecified Roost	SU735108

Bechstein's Bat and Barbastelle within 10 km of the Site

Bechstein's Bat

- 1.117. HBIC provided 113 records of Bechstein's bat within 10 km of the Reservoir Site and the Pipeline Corridor, of these records 23 are within the Reservoir Site of which two were roost sites. The nearest Bechstein's bat roost records to the Pipeline Corridor are located approximately 280 m north east of the Pipeline Corridor.
- 1.118. SxBRC provided 17 records of Bechstein's bat within 10 km of the Site (Reservoir Site and Pipeline Corridor). The nearest record is located approximately 1.94 km east within the Rowlands Castle area.
- 1.119. SxBRC provided four records of a Bechstein's bat unspecified roosts, within Hollywood, located approximately 3 km south east of the Reservoir Site and approximately 4 km south east of the Pipeline Corridor, and one record of a Bechstein's bat unspecified roost within Lyels Wood, located approximately 2.34 km east of the Reservoir Site and approximately 3.3 km east of the Pipeline Corridor.
- 1.120. The records are shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0042 in Appendix K.

Barbastelle

- 1.121. HBIC provided 46 records of barbastelle within 10 km of the Reservoir Site including five records within the Reservoir Site. No records of roost sites within 10 km were provided.
- 1.122. HBIC provided 44 records of barbastelle within 10 km of the Pipeline Corridor, the nearest record is approximately 650 m north of the Pipeline Corridor and within the Reservoir Site. No records of roost sites within 10 km were provided.
- 1.123. SxBRC provided 34 records of barbastelle within 10 km of the Site (Reservoir Site and Pipeline Corridor). The nearest record is located at Stanstead Arboretum, located approximately 3.5 km east of the Reservoir Site and approximately 4.5 km east of the Pipeline Corridor.
- 1.124. SxBRC provided one record of an unspecified barbastelle roost within 10 km of the Site (Reservoir Site and Pipeline Corridor), within a barn located approximately 8.8 km north east of the Reservoir Site and approximately 10 km north of the Pipeline Corridor.
- 1.125. The records are shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0042 in Appendix K.

Bat Licences within 2 km of the Site

- 1.126. The desk study search¹⁵ identified the following five records of EPSMLs for bats within 2 km of the Site:
- Licence No: EPSM2013-5591, located approximately 1.9 km west of the Reservoir Site at OSGR:SU685096. The bat species on the licence include common pipistrelle and brown long-eared bat. The licence commenced in March 2013 and ended in September 2016;
 - Licence No: EPSM2009-1129, located approximately 1.8 km north west of the Reservoir Site at OSGR:SU69491201. The bat species on the licence include common pipistrelle, brown long-eared bat and serotine. The licence commenced in September 2009 and ended in December 2012;

¹⁵ Desk study search using the Government site: <https://magic.defra.gov.uk/MagicMap.aspx>

- Licence No: EPSM2013-6454, located approximately 1.7 km north of the Reservoir Site at OSGR: SU70491290. The bat species on the licence include common pipistrelle. The licence commenced in October 2013 and ended in August 2016;
- Licence No: EPSM2012-4836, located approximately 1.9 km north of the Reservoir Site at OSGR: SU70701322. The bat species on the licence include common pipistrelle. The licence commenced in September 2012 and ended in September 2015; and,
- Licence No: 2014-1826-EPS-MIT, located approximately 500 m east of the Pipeline Corridor at OSGR: SU70790632. The bat species on the licence include common pipistrelle. The licence commenced in August 2014 and ended in November 2015.

1.127. These are shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0043 in Appendix L.

Hazel Dormouse

- 1.128. HBIC provided six records of hazel dormouse within 2 km of the Reservoir Site and five records of hazel dormouse within 2 km of the Pipeline Corridor. The nearest record to both sites is of a recorded nest Site at OSGR: SU699090, located around the Dunsbury Park development, approximately 1 km west of the Reservoir Site and 1.8 km west of the Pipeline Corridor. SxBRC provided no records of hazel dormouse within 2 km of the Site. These are shown on Figure xx provided in Appendix M.
- 1.129. The desk study search¹⁶ identified the following three records of EPSMLs for hazel dormouse within 2 km of the Site. These are shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0015 provided in Appendix M:
- Licence no: 2014-456-EPS-MIT, located approximately 1 km west of the Reservoir Site and 1.5 km west of the Pipeline Corridor at OSGR: SU69890913. The licence commenced in May 2014 and ends in October 2020;
 - Licence no: 2016-21182-EPS-MIT, located approximately 1 km west of the Reservoir Site and 1.5 km west of the Pipeline Corridor at OSGR: SU69900901. The licence commenced in March 2016 and ended in January 2019; and,
 - Licence no: 2014-3156-EPS-MIT, located 1.7 km south west of the Reservoir Site and 1.3 km west of the Pipeline Corridor at OSGR: SU69700784. The licence commenced in September 2014 and ended in December 2012.

Otter

- 1.130. HBIC and SxBRC provided no records of otter within 2 km of the Reservoir Site or Pipeline Corridor.

Water Vole

- 1.131. HBIC and SxBRC provided no records of water vole within 2 km of the Reservoir Site.
- 1.132. HBIC provided 62 records of water vole all predominantly around the Lavant Stream between Solent Retail Park at OSGR: SU715060 and Langstone Harbour on the south coastline, OSGR: SU715048. The nearest record to the Pipeline Corridor is approximately 740 m east. These are shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0016 provided in Appendix N.
- 1.133. SxBRC provided no records of water vole within 2 km of the Site.

Badger

- 1.134. HBIC provided two records of badger within 2 km of the Reservoir Site. The nearest record is located approximately 670 m north and within the Forestry England Site, The Holt SINC at OSGR: SU714121.
- 1.135. HBIC provided one record of badger within 2 km of the Pipeline Corridor, located approximately 1.9 km south west at the OSGR: SU6807, on land south of South Downs College and west of the A3 (M). These are shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0017 provided in Appendix O.
- 1.136. SxBRC provided no records of badger within 2 km of the Site.

Birds

- 1.137. HBIC provided 3,005 records of priority and notable bird species within 1 km of the Reservoir Site, including 71 species of birds.

¹⁶ Desk study search using the Government site: <https://magic.defra.gov.uk/MagicMap.aspx>

- 1.138. HBIC provided records of 19 bird species listed on Annex 1 of the Birds Directive¹⁷, within 1 km of the Reservoir Site including: black kite, ferruginous duck, glossy ibis, hen harrier, honey buzzard, kingfisher, little egret, marsh harrier, Mediterranean gull, merlin, Montagu's harrier, nightjar, osprey, peregrine, red kite, sandwich tern, short-eared owl, stone-curlew, Dartford warbler and white stork. Eight of these bird species were recorded within the Reservoir Site, including: short-eared owl, little egret, Mediterranean gull, nightjar, peregrine, red kite, Dartford warbler and kingfisher. These are listed in Table 16 and shown Figure HTR-ATK-ZZ-ZZ-GS-Z-0045 provided in Appendix P.
- 1.139. HBIC provided records of 25 bird species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), within 1 km of the Reservoir Site, including: barn owl, black redstart, black-tailed godwit, brambling, Cetti's warbler, common crossbill, fieldfare, firecrest, goshawk, green sandpiper, hen harrier, hobby, honey buzzard, kingfisher, little ringed plover, marsh harrier, Mediterranean gull, Montagu's harrier, osprey, peregrine, red kite, redwing, serin, stone-curlew and whimbrel. Ten of these bird species were recorded within the Site, including: barn owl, common crossbill, whimbrel, red kite, redwing, fieldfare, firecrest, green sandpiper, kingfisher and Mediterranean gull.
- 1.140. HBIC provided records of 16 bird species that are species of principle importance¹⁸, within 1 km of the Reservoir Site including cuckoo, grey partridge, hawfinch, house sparrow, lapwing, lesser redpoll, nightjar, reed bunting, ring ouzel, skylark, flycatcher, stone curlew, tree pipit, turtle dove, wood warbler and yellowhammer. Ten of these bird species were recorded within the Reservoir Site including: skylark, spotted flycatcher, yellowhammer, lapwing, lesser redpoll, Mediterranean gull, nightjar, reed bunting, ring ouzel and cuckoo.
- 1.141. HBIC provided records of 31 birds of conservation concern, red list¹⁹ within 1 km of the Reservoir Site including black redstart, black-tailed godwit, cuckoo, fieldfare, grasshopper warbler, grey partridge, grey wagtail, hawfinch, hen harrier, herring gull, house sparrow, lapwing, lesser black-backed gull, lesser redpoll, lesser spotted woodpecker, linnet, marsh tit, mistle thrush, nightingale, redwing, ring ouzel, skylark, song thrush, spotted flycatcher, starling, tree pipit, turtle dove, whimbrel, woodcock, yellow wagtail and yellowhammer.
- 1.142. HBIC provided records of 16 bird species that are County Rare (CR) in Hampshire, within 1 km of the Reservoir Site including: bearded tit, black redstart, black-headed gull, goshawk, grass-hopper warbler, great black-backed gull, herring gull, honey buzzard, lesser black-backed gull, little egret, marsh harrier, Mediterranean gull, red kite, sandwich tern, whinchat and yellow wagtail.
- 1.143. HBIC provided records of 10 bird species that are County Scarce (CS) in Hampshire, within 1 km of the Reservoir Site including: Cetti's warbler, common crossbill, firecrest, grey heron, little ringed plover, nightingale, snipe, stone-curlew, water rail and wheatear.
- 1.144. HBIC provided records of six bird species that are County of Other Interest (CI) species, within 1 km of the Reservoir Site, including: black-tailed godwit, hawfinch, hobby, nightjar, siskin and wood warbler. This category is an umbrella group to cover those species defined as notable on criteria other than rarity/scarcity. The full criteria is included in Appendix D.
- 1.145. Priority and notable bird species discussed above, that have been recorded within the Reservoir Site are presented in Table 16.
- 1.146. SxBRC provided records of nine species of birds within 1 km of the Reservoir Site, however no bird species were recorded within 1 km of the Pipeline Corridor. Three of these species (Mediterranean gull, red kite and little egret) are listed on Annex 1 of the Birds Directive²⁰. Seven of these species

¹⁷ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147>

¹⁸ Species of principal importance for the conservation of biodiversity are identified by the Secretary of State for England, in consultation with Natural England, are referred to in S.41 of the NERC Act for England. The list, known as the 'England Biodiversity List', of habitats and species can be found on the Natural England web site.

¹⁹ Every five years the leading governmental and non-governmental conservation organisations in the UK, chaired by the RSPB, review the population status of the birds that are regularly found here to keep track of changes in abundance and range. In 2002 a total of 247 species were assessed, and each was placed onto one of three lists - red, amber or green - based on a set of quantitative criteria. See <http://www.bto.org/psob/index.htm> for more information. Red list – Comprises 40 species that are Globally Threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recent recovery.

²⁰ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147>

are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)²¹, these are common crossbill, fieldfare, firecrest, green sandpiper, Mediterranean gull, red kite and redwing.

Table 16 - HBIC Bird Species Records within 1 km of the Reservoir Site

Common Name	Conservation Status	No of Records within 1 km	Records within the Reservoir Site and general location	Grid Ref
Short-eared owl	Annex 1	8	Within the Site (ecological enhancement area), within Havant Thicket	SU720100
Siskin	County- CI	28	Within the Site (ecological enhancement area), within Havant Thicket	SU7010
Skylark	NERC- S41; BOCC -Red	42	Within the Site open grassland	SU720096
Song thrush	BOCC -Red	116	Within the Site (ecological enhancement area), within Havant Thicket	SU7109
Spotted fly catcher	NERC- S41; BOCC -Red	20	Within the Site (ecological enhancement area), within Havant Thicket	SU7109
Wheatear	County -CS	20	Within the Site (ecological enhancement area), within Havant Thicket	SU7109
Whimbrel	WACA Sch 1; BOCC -Red	16	Within the Site (ecological enhancement area), within Havant Thicket	SU7110
Whinchat	BOCC -Red	36	Within the Site (ecological enhancement area), within Havant Thicket	SU7109
Wood warbler	WACA Sch 1; BOCC -Red; County -CI	2	Within the Site (ecological enhancement area), within Havant Thicket	SU7110
Woodcock	BOCC -Red	22	Within the Site (ecological enhancement area), within Havant Thicket	SU7110
Yellow wagtail	BOCC -Red	15	Within the Site (ecological enhancement area), within Havant Thicket	SU7110
Yellowhammer	NERC- S41; BOCC -Red	62	Within the Site (ecological enhancement area), within Havant Thicket	SU7110
Lapwing	NERC- S41; BOCC -Red	16	Within the Site (ecological enhancement area), within Havant Thicket	SU7110
Lesser redpoll	NERC- S41; BOCC -Red	18	Within the Site (ecological enhancement area), within Havant Thicket	SU7110

Common Name	Conservation Status	No of Records within 1 km	Records within the Reservoir Site and general location	Grid Ref
Lesser spotted woodpecker	BOCC -Red	2	Within the Site (ecological enhancement area), within Havant Thicket	SU7210
Linnet	BOCC -Red	28	Within the Site (ecological enhancement area), within Havant Thicket	SU7107
Little egret	Annex 1; County -CR	20	Within the Site (ecological enhancement area), within Havant Thicket	SU712091
Marsh tit	BOCC -Red	65	Within the Site, The Avenue	SU716097
Mediterranean gull	Annex 1; NERC- S41; County - CR	176	Within the Site, within open grassland habitat	SU7109
Mistle thrush	BOCC -Red	28	Within the Site (ecological enhancement area), within Havant Thicket	SU7110
Nightjar	Annex 1; NERC- S41;	70	Within the Site (ecological enhancement area), within Havant Thicket	SU7110
Red kite	Annex 1; WACA Sch 1; County - CR	138	Within the Site (ecological enhancement area), within Havant Thicket	SU7110
Redstart	County - CI	18	Within the Site(ecological enhancement area), within Havant Thicket	SU7110
Redwing	WACA Sch 1; BOCC -Red	30	Within the Site(ecological enhancement area), within Havant Thicket	SU7110
Reed bunting	NERC- S41;	4	Within the Site (ecological enhancement area), within Havant Thicket	SU7111
Ring ouzel	NERC- S41; BOCC -Red	8	Within the Site (ecological enhancement area), within Havant Thicket	SU7110
Dartford warbler	Annex 1; WACA Sch 1; County - CI	1	Within the Site (ecological enhancement area), within Havant Thicket	SU7110
Fieldfare	WACA Sch 1; BOCC -Red	12	Within the Site (ecological enhancement area), within Havant Thicket	SU7110
Firecrest	WACA Sch 1 County - CI	98	Within the Site (ecological enhancement area),within Havant Thicket	SU7209
Grey heron	County - CS	14	Within the Site, within open grassland	SU7109

Common Name	Conservation Status	No of Records within 1 km	Records within the Reservoir Site and general location	Grid Ref
Green sandpiper	WACA Sch 1	306	Within the Site (ecological enhancement area), within Havant Thicket	SU711073
Herring gull	BOCC -Red County - CR	50	Within the Site, within open grassland	SU7210
Kingfisher	Annex 1; WACA Sch 1	56	Within the Site (ecological enhancement area), within Havant Thicket	SU7110
Black-headed gull	County - CR	14	Within the Site, within open grassland	SU7210
Cuckoo	NERC- S41; BOCC -Red	18	Within the Site (ecological enhancement area), within Havant Thicket	SU7110

- 1.147. HBIC provided 7,138 records of notable bird species within 1 km of the Pipeline Corridor, including 120 species of birds. These are listed in Table 17 and shown Figure HTR-ATK-ZZ-ZZ-GS-Z-0050 in Appendix P.
- 1.148. HBIC provided records of 30 bird species listed on Annex 1 of the Birds Directive²², within 1 km of the Pipeline Corridor including: avocet, barnacle goose, bar-tailed godwit, black kite, black tern, black-throated diver, common tern, ferruginous duck, glossy ibis, golden plover, hen harrier, kingfisher, little egret, little tern, Mediterranean gull, merlin, Montagu's harrier, nightjar, osprey, peregrine, red kite, red-throated diver, ruddy shelduck, ruff, sandwich tern, short-eared owl, Slavonian grebe, spoonbill, stone-curlew and tawny pipit. Kingfisher is the nearest recorded species to the Pipeline Corridor, located immediately east, on the Hermitage Stream at OSGR: SU7007.
- 1.149. HBIC provided three records of bird species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), within 1 km of the Pipeline Corridor including, peregrine, kingfisher and Cetti's warbler. Kingfisher is the nearest recorded of these species to the Pipeline Corridor, located immediately east, on the Hermitage Stream at OSGR: SU7007.
- 1.150. HBIC provided records of 44 bird species that are species of principle importance²³, within 1 km of the Pipeline Corridor including avocet, barn owl, bearded tit, black redstart, black tern, black-necked grebe, black-tailed godwit, cetti's warbler, common crossbill, common scoter, fieldfare, firecrest, garganey, goshawk, great northern diver, green sandpiper, greenshank, hen harrier, hobby, honey buzzard, kingfisher, lapland bunting, little gull, little ringed plover, little tern, long-tailed duck, marsh harrier, Mediterranean gull, merlin, Montagu's harrier, osprey, peregrine, red kite, redwing, ruff, scaup, slavonian grebe, spoonbill, stone-curlew, velvet scoter, whimbrel, wood sandpiper, woodlark and wryneck. The nearest recorded of these species to the Pipeline Corridor are spotted flycatcher located immediately east within SCP at the OSGR: SU7108 and yellowhammer, located immediately south east within Leigh Park at the OSGR: SU7008.
- 1.151. HBIC provided records of 26 bird species that are County Rare (CR) in Hampshire, within 1 km of the Pipeline Corridor including: avocet, bearded tit, black redstart, black-headed gull, common tern, goosander, goshawk, grasshopper warbler, great black-backed gull, herring gull, honey buzzard, lesser black-backed gull, little egret, little tern, long-eared owl, marsh harrier, Mediterranean gull, Montagu's harrier, peregrine, pied flycatcher, red kite, rock pipit, sandwich tern, shoveler, whinchat and yellow wagtail. Yellow wagtail is the nearest recorded of these species, immediately east of the Pipeline Corridor, on the Hermitage Stream Bedhampton at the OSGR: SU7007.

²² Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147>

²³ Species of principal importance for the conservation of biodiversity are identified by the Secretary of State for England, in consultation with Natural England, are referred to in S.41 of the NERC Act for England. The list, known as the 'England Biodiversity List', of habitats and species can be found on the Natural England web site.

- 1.152. HBIC provided records of 14 bird species that are County Scarce (CS) in Hampshire, within 1 km of the Pipeline Corridor including: Cetti's warbler, common crossbill, firecrest, grey heron, little ringed plover, nightingale, oystercatcher, pochard, sand martin, snipe, stone-curlew, water pipit, water rail and wheatear. Water rail and oystercatcher are the nearest recorded of these species, immediately east of the Pipeline Corridor on the Hermitage Stream at the OSGR: SU7007.
- 1.153. HBIC provided records of 10 bird species that are County of Other Interest (CI) species, within 1 km of the Pipeline Corridor, including: black-tailed godwit, great crested grebe, grey plover, hobby, nightjar, redstart, shelduck, siskin, wood warbler and woodlark. Siskin is the closest recorded species to the Pipeline Corridor, located immediately south east within Leigh Park at the OSGR: SU7107. The full criteria are included in Appendix D.

Table 17 - HBIC Bird Species Records within 1 km of the Pipeline Corridor

Common Name	Conservation Status	No of Records within 1 km	Approximate Closest Record to Pipeline Corridor and general location	Grid Ref
Siskin	County -CI	37	Immediately south east of the Site, Leigh Park area	SU7107
Spotted fly catcher	NERC- S41; BOCC -Red	16	Immediately east of the Site, within SCP	SU7108
Water rail	County - CS	77	Immediately east of the Site, on the Hermitage Stream Bedhampton	SU7007
Yellow wagtail	BOCC -Red County - CR	70	Immediately east of the Site, on the Hermitage Stream Bedhampton	SU7007
Yellowhammer	NERC- S41; BOCC -Red	22	Immediately south east of the Site, Leigh Park area	SU7008
Oystercatcher	County - CS	98	Immediately west of the site within Bedhampton Water Works	SU7006
Kingfisher	Annex 1; WACA Sch 1	206	Immediately east of the Site, on the Hermitage Stream	SU7007
Grey heron	County - CS	195	215 m south west within the Bedhampton Mill Pond	SU7006
Cetti's warbler	WACA Sch 1; County - CS	183	215 m south west within the Bedhampton Mill Pond	SU704063

Common Reptiles

Adder

- 1.154. HBIC provided 35 records of adder within 2 km of the Reservoir Site. The nearest record of adder is located within the Reservoir Site along the northern boundary of Havant Thicket woodland within open mire vegetation at OSGR: SU711110. This is also the only record of adder within 2 km of the Pipeline Corridor.

Slow Worm

- 1.155. HBIC provided 50 records of slow worm within 2 km of the Reservoir Site. The nearest record is located approximately 512 m east, within the Former Brickworks, The Drift, Rowlands Castle, OSGR: SU730102.
- 1.156. HBIC provided 10 records of slow worm within 2 km of the Pipeline Corridor. The nearest record is located within a garden on High Lawn Road and immediately adjacent to the Pipeline Corridor at OSGR SU719089.

Common Lizard

- 1.157. HBIC provided 12 records of common lizard within 2 km of the Reservoir Site. The nearest record to the Reservoir Site is approximately 350 m south and located within Staunton Country Park, OSGR: SU719089. This is also the only record of common lizard within 2 km of the Pipeline Corridor, located approximately 200 m east of the Pipeline Corridor.

Grass Snake

- 1.158. HBIC provided 16 records of grass snake within 2 km of the Reservoir Site. The nearest record is located approximately 300 m south of the Reservoir Site within Staunton Country Park (SCP) at OSGR: SU720091. HBIC also provided six records of grass snake within 2 km of the Pipeline Corridor. The SCP record is also the nearest record to the Pipeline Corridor and is located approximately 148 m east.
- 1.159. The records of adder, slow worm, common lizard and grass snake described above are shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0018 provided in Appendix Q.
- 1.160. SxBRC provided no records of common reptiles within 2 km of the Site.

Great Crested Newt

- 1.161. HBIC provided three records of great crested newt within 2 km of the Reservoir Site and two records of great crested newt within 2 km of the Pipeline Corridor. A record located within Rowlands Castle at the OSGR: SU730102 is the nearest record to the Reservoir Site and located approximately 535 m east of the Reservoir Site. This is also the nearest record of great crested newt to the Pipeline Corridor and is located approximately 1.9 km east of the Pipeline Corridor. SxBRC provided no records of great crested newt within 2 km of the Site. These records are shown Figure HTR-ATK-ZZ-ZZ-GS-Z-0019 provided in Appendix R.
- 1.162. The desk study search²⁴ identified the following two records of EPSMLs for great crested newt within 2 km of the Site:
- Licence No: EPSM2009-795, located approximately 345 m north of the Reservoir Site, at OSGR: SU70971142. The licence commenced in June 2012 and ended in October 2018; and,
 - Licence No: 2014-3400-EPS-AD2, located approximately 555 m east of the Reservoir Site, at the OSGR:SU72981021. The licence commenced in August 2015 and ends in July 2025.

Terrestrial Invertebrates

- 1.163. HBIC provided 2,134 records of terrestrial invertebrate species within 1 km of the Reservoir Site. These are described in Appendix S and shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0046 provided in Appendix S.

²⁴ Desk study search using the Government site: <https://magic.defra.gov.uk/MagicMap.aspx>

- 1.164. HBIC provided two records of a moth species, Jersey tiger, listed on Annex 2 (non-priority) species of the Habitats Directive 1992 (as amended)²⁵. This species was recorded immediately south of the Reservoir Site and immediately west of the Pipeline Corridor at OSGR: SU713089.
 - 1.165. HBIC provided records of 30 moth species that are species of principle importance, within 1 km of the Reservoir Site, including: beaded chestnut, blood-vein, brown-spot pinion, buff ermine, cinnabar, crescent, dark-barred, twin-spot carpet, dot moth, dusky thorn, dusky brocade, ear moth, feathered gothic, garden tiger, green-brindled crescent, grey dagger, hedge rustic, knot grass, lackey, minor shoulder-knot, mottled rustic, oak hook-tip, rosy minor, rosy rustic, rustic, sawfly, September thorn, shaded broad-bar, shoulder-striped wainscot, small square-spot and white ermine.
 - 1.166. HBIC provided records of five moth species that are species of principle importance, within 1 km of the Reservoir Site, including: dingy skipper, grizzled skipper, small blue, small heath and white admiral.
 - 1.167. There are two moth species including yellow pearl and Kent bent-wing and three butterfly species including dingy skipper, grizzled skipper and white admiral that are listed as vulnerable on the IUCN Red List species (2001)²⁶.
 - 1.168. Ten moth species have been recorded within the Reservoir Site, within Havant Thicket woodland, including:
 - grey dagger, a species of principle importance, barred Umber, Critically Scarce (CS) in Hampshire; and,
 - birch lift, clouded slender, clover slender, common spruce bell, silver-barred bell, spruce argent, virgin pigmy and willow midget that are all Critically Rare (CR) in Hampshire.
 - 1.169. Five butterfly species have been recorded within the Reservoir Site, within Havant Thicket woodland and Bell's Copse woodland. including:
 - small heath and white admiral that are species of principle importance²⁷;
 - dark green fritillary and purple emperor that are Critically Scarce (CS) in Hampshire; and,
 - silver-washed fritillary, a County of Other Interest (CI) species in Hampshire²⁸.
 - 1.170. HBIC provided two records of a large black slug, located within the Reservoir Site, within Havant Thicket woodland, that is listed as data deficient on the IUCN Red List species (2001)²⁹. The IUCN defines data deficient species as ones where '*there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status*' (IUCN, 2001).
 - 1.171. HBIC provided 713 records of terrestrial invertebrate species within 1 km of the Pipeline Corridor. None of the records provided are within the Pipeline Corridor. The nearest records to the Pipeline Corridor are described in Appendix S and shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0053 provided in Appendix S.
- Priority and Notable Plants**
- 1.172. HBIC provided 174 records of flowering plants within 1 km of the Site (the Reservoir Site and the Pipeline Corridor). These are shown on Figures HTR-ATK-ZZ-ZZ-GS-Z-0047 and HTR-ATK-ZZ-ZZ-GS-Z-0049 provided in Appendix T.
 - 1.173. One priority and three notable plant species are recorded within the Site in Havant Thicket, Bell's Copse woodlands, including:

²⁵ EC Directive on the conservation of natural habitats and of wild fauna and flora (92/42/EEC). Annex II - Non-priority - Endangered animal and plant species that are of Community interest (i.e. endangered, vulnerable, rare or endemic in the European Community) requiring the designation of special areas of conservation.

²⁶ IUCN, 2001. The IUCN Red List Categories and Criteria, species at high risk of global extinction. Vulnerable (VU) - Taxa believed likely to move into the Endangered category in the near future if the causal factors continue operating. [IUCN-RL-2001-001, 2nd ed.](#)

²⁷ Species of principal importance for the conservation of biodiversity are identified by the Secretary of State for England, in consultation with Natural England, are referred to in S.41 of the NERC Act for England. The list, known as the 'England Biodiversity List', of habitats and species can be found on the Natural England web site.

²⁸ This category is an umbrella group to cover those species defined as notable on criteria other than rarity/scarcity. The full criteria is included in Appendix D.

²⁹ IUCN, 2012. The IUCN Red List Categories and Criteria, species at high risk of global extinction. Vulnerable (VU) - Taxa believed likely to move into the Endangered category in the near future if the causal factors continue operating. [IUCN-RL-2001-001, 2nd ed.](#)

- butcher's broom, listed on Annex 5 of the Habitats Directive 1992 (as amended);
- chaffweed, listed as endangered on the IUCN Red List species (2001);
- rush hybrid sp. (*Juncus effusus* x *conglomeratus* = *J. x kern-reichgeltii*), Critically Rare (CR) in Hampshire; and,
- lesser spearwort, listed as vulnerable on the IUCN Red List species (2001).

1.174. Three notable plant species are located immediately adjacent to the Bedhampton and Havant Springs Pumping Site and include:

- strawberry clover, listed as vulnerable on the IUCN Red List species (2001);
- wild celery, Critically Scarce (CS) in Hampshire; and,
- divided sedge, recorded '*in and around the brackish ditches and depressions*' and a species of principle importance, a nationally scarce species and listed as vulnerable on the IUCN Red List species (2001).

1.175. SxBRC provided no records of protected or notable plants within 1 km of the Site.

Invasive Non-Native Plant Species and Animal Species

1.176. HBIC provided 48 records of invasive non-native plant species within 1 km of the reservoir site including Spanish bluebell, butterfly bush, cherry laurel, Corsican pine, cotoneaster sp., holm oak, garden privet, Mexican fleabane, montbretia, New Zealand pigmyweed, parrot's feather, Portugal laurel, red oak, rhododendron, turkey oak, Wilson's honeysuckle and yellow archangel. The following species were recorded within the reservoir site:

- Cherry laurel, within Bell's Copse at the OSGR: SU706100;
- Corsican pine, within Havant Thicket at the OSGR: SU714109;
- Holm oak within Havant Thicket at the OSGR: SU7110;
- Montbretia within Havant Thicket at the OSGR: SU715105;
- Rhododendron within Havant Thicket at the OSGR: SU7210; and,
- Turkey oak within Bell's Copse at the OSGR: SU707100 and within Havant Thicket at the OSGR: SU715105;

1.177. HBIC provided 32 records of invasive non-native plant species within 1 km of the pipeline corridor including bay, butterfly bush, buttonweed, Canadian goldenrod, cherry laurel, Corsican pine, cotoneaster sp., holm oak, false Virginia creeper, giant butterbur, Himalayan balsam, Japanese knotweed, Japanese rose, kerria japonica, red oak, rhododendron, turkey oak and Virginia-creeper.

1.178. The nearest INNPS species recorded to the pipeline corridor are butterfly bush, Corsican pine, false-virginia creeper, Himalayan balsam and Japanese knotweed, all recorded immediately south of the pipeline corridor within Bedhampton Water Treatment Works at the OSGR: SU704063/ SU707065

1.179. HBIC provided 18 records of non-native animal species within 1km of the reservoir site including, Egyptian Goose, fallow deer, grey squirrel, horse chestnut leaf minor, light brown apple moth, Mandarin duck and muntjac. The following species were recorded within the reservoir site:

- Egyptian goose and Mandarin duck were recorded within reservoir site (Havant Thicket) at the OSGR: SU714100;
- grey squirrel was recorded within the Avenue at the OSGR: SU719093; and,
- Horse Chestnut leaf miner was recorded in within the reservoir site (Havant Thicket) at the OSGR: SU720107.

1.180. HBIC provided 11 records of non-native animal species within 1km of the pipeline corridor including Canada goose, Egyptian goose, grey squirrel, horse chestnut leaf miner, Mandarin duck and ruddy shelduck. None of these species were recorded within the pipeline corridor and the nearest record of a non-native animal species to the pipeline corridor is grey squirrel within West Leigh at the OSGR: SU722087, approximately 350 m east of the pipeline corridor.

SxBRC provided no records of INNPS or non-native animal species within 1 km of the reservoir Site and pipeline corridor.

Other Priority Species

- 1.181. The following records are shown on Figure HTR-ATK-ZZ-ZZ-GS-Z-0045 in Appendix U.
- 1.182. HBIC provided three records of common toad within 1 km of the Site, one record is within Reservoir Site, Havant Thicket at OSGR: SU7109.
- 1.183. HBIC provided one record of common seal located approximately 1.5 km downstream (via the Hermitage Stream) of Pipeline Corridor within Langstone Harbour, at OSGR: SU70960475. Common seal is protected in Britain under the Conservation of Seals Act 1970 and classified as a species of principle importance³⁰.
- 1.184. HBIC provided one record of yellow-necked mouse, located approximately 1.9 km south east of the Pipeline Corridor, at OSGR: SU70960475. The species is considered to be scarce in Hampshire.
- 1.185. HBIC provided 53 records of European hedgehog, a species of principle importance, within 2 km of the Site. The nearest record to the Reservoir Site is approximately 30 m east on the B2148 Manor Lodge Road. The nearest record to the Pipeline Corridor is approximately 460 m west of along the boundary of Great Copse Ancient Woodland.

Legal Protection and Conservation Status

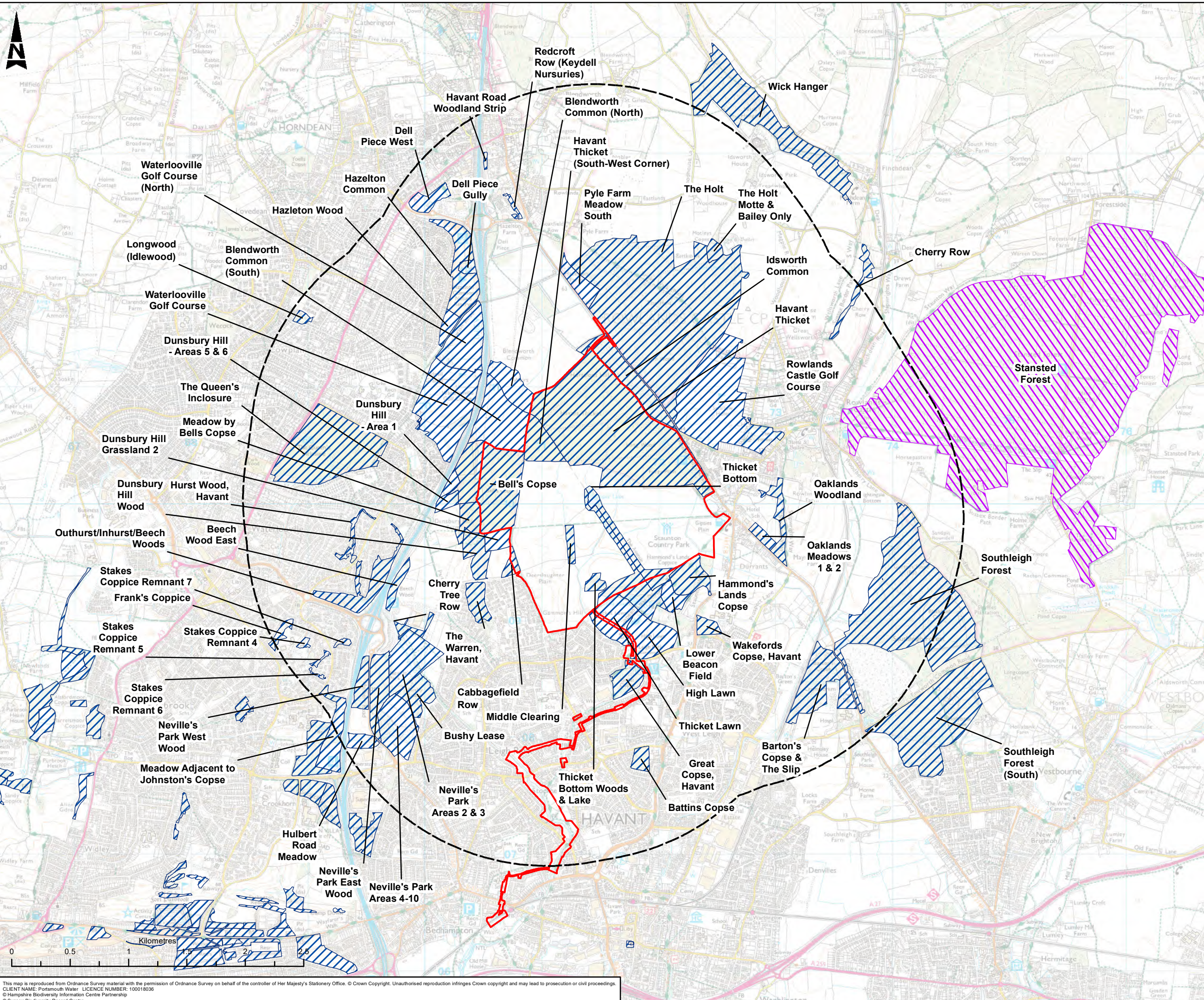
- 1.186. Details on the legal protection and conservation status of species and habitats can be found in Appendix V.
- 1.187. HBICs information on legal status and notable species is provided in Appendix W.

³⁰ Habitats and species of principal importance for the conservation of biodiversity are identified by the Secretary of State for England, in consultation with Natural England, are referred to in S.41 of the NERC Act for England.

Appendix A9.1.A

Statutory Designated Sites

Appendix A9.1.B Non-Statutory Designated Sites within 2 km of the Site



Red Line Boundary

2km Study Area

Site of Importance for Nature Conservation (SINC)

Local Wildlife Site (LWS)

C01	FD	KT	CW	LB	PUBLISHED		19/06/2020
Rev.	Dn By	Old By	Rev By	Auth By	Description		Date

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Drawing Suitability		Status	
PUBLISHED		A1	

Contractors Drawing Number:
HTR - ATK - ZZ - ZZ - GS - Z - 0025
Project | Originator | Volume | Location | Type | Role | Number

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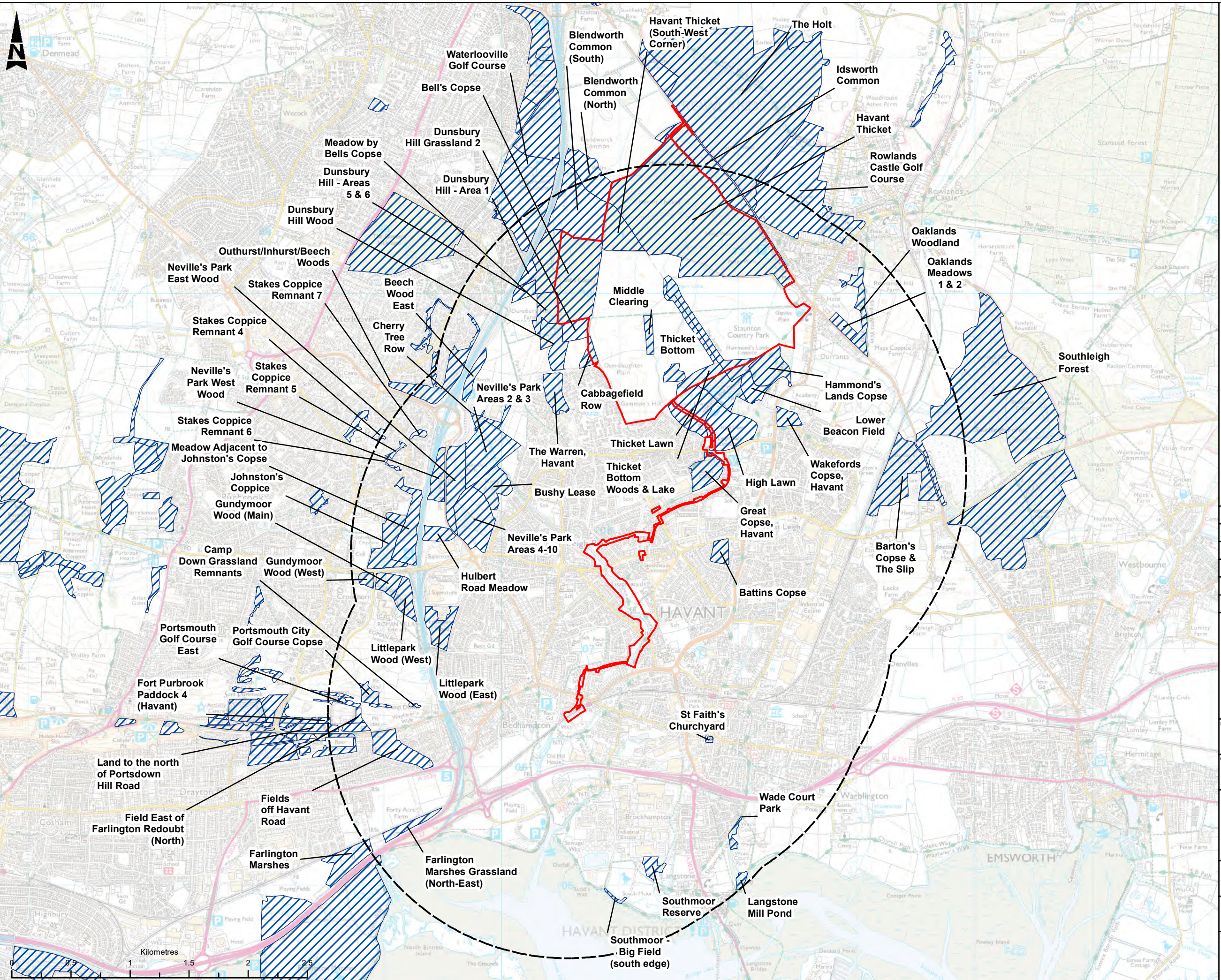
Project Ref. No	Sheet	Scale	Sheet Size
5169117	1 of 1	1:30,000	A3

Project Title
HAVANT THICKET RESERVOIR

Drawing Title
**NON-STATUTORY DESIGNATIONS
WITHIN 2KM OF THE RESERVOIR**

Portsmouth Water Drawing Number	Rev
	C01

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- Red Line Boundary
- 2km Study Area
- Site of Importance for Nature Conservation (SINC)

C01	FD	KT	CW	LB	PUBLISHED	19/09/2020
Rev.	Dn By	Old By	Rev By	Auth By	Description	Date

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Drawing Suitability	Status
PUBLISHED	A1

Contractors Drawing Number:
HTR - ATK - ZZ - ZZ - GS - Z - 0084
Project | Originator | Volume | Location | Type | Role | Number

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Project Ref. No	Sheet	Scale	Sheet Size
5169117	1 of 1	1:30,000	A3

Project Title
HAVANT THICKET RESERVOIR

Drawing Title
**NON-STATUTORY DESIGNATIONS
WITHIN 2KM OF THE PIPELINE**

Portsmouth Water Drawing Number	Rev
	C01

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Appendix A9.1.C Irreplaceable Habitats within 2 km of the Scheme

Appendix A9.1.D Ancient Woodland Report

**Review of six plots of woodland in and adjacent to the
Proposed Havant Thicket Reservoir Site, Hampshire for
their ancient woodland status; the significance and value
of their lichen flora and vegetation; the presence of
veteran trees and the condition of the woodlands.**

Authors: Cross, AM BSc (Hons) MSc MCIEEM and Sanderson, NA BSc (Hons) MSc

Version 5.0

June 2020

FINAL REPORT

Review of six plots of woodland in and adjacent to the Proposed Havant Thicket Reservoir Site, Hampshire for their ancient woodland status; the significance and value of their lichen flora and vegetation; the presence of veteran trees and the condition of the woodlands.

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Appendix 2	Aerial Photography 1946 - 1981
Appendix 3	Report: 'Havant Thicket. Proposed Reservoir Site – Nature Conservation Value. For Hampshire Wildlife Trust' (Sanderson, 1994)

Executive Summary

Portsmouth Water Ltd commissioned a review of six plots of woodland in and adjacent to the Proposed Havant Thicket Reservoir Site, Hampshire for their ancient woodland status and condition and fieldwork to identify the significance and value of the lichen flora and vegetation of those six woods as well as the presence of veteran trees.

1. The Avenue: this is a relic of an ancient pasture woodland habitat and has good surviving elements of that habitat. The lichen flora includes relicts of the pasture woodland habitat and is only one of four such areas that survive from the Forest of Bere and attached commons. Eighteen veteran trees were recorded from this wood. Its condition is unfavourable and declining. **The woodland is a species rich ancient woodland relic with some features of interest inherited from previous pasture woodland ecosystem still present.**

2. Middle Clearing: originally part of the ancient pasture woodland complex, this has had a history of clearance, replanting and - in more recent times – was part of a modern grazing system. There is no significant lichen interest here and no veteran trees. **The woodland present today is certainly not ancient pasture woodland, and little survives to justify an ancient woodland status.**

3. Round Wood: originally part of the ancient pasture woodland complex, this has had a history of clearance, replanting and - in more recent times – was part of a modern grazing system. There is no significant lichen interest here and no veteran trees. **The woodland present today is certainly not ancient pasture woodland. So little survives of the biological heritage of this plot, it is difficult to describe it as ancient woodland.**

4. The Corsican Pine Plantation: originally part of the ancient pasture woodland complex, this has had a history of clearance and replanting. Unlike Middle Clearing and Round Copse, this area was never subject to intensive grazing. There is no lichen interest here and no veteran trees. Whilst there is very little surviving from the ancient pasture woodland, the natural regeneration under the Pine is scrub vegetation and flora characteristic of the soils of this area. **The stand can be considered a Plantation on an Ancient Woodland Site (PAWS).**

5. Blendworth Fragment the origins of this small area of woodland are difficult to trace but some map evidence and the tithe apportionments indicate that this area –in a separate parish from Havant Thicket – was not wooded in the first part of the 1800's though it was planted by 1870 and has remained woodland since then. There is no lichen interest and no veteran trees identified though the boundary banks do have old, 'character trees'. There are some yews present and these are impossible to date. The condition of the woodland is unfavourable and probably declining. **The Blendworth fragment is probably not ancient woodland.**

6. Bell's Copse fragment: this area was badly damaged when cleared in the 1970s. Since then, however, the plot is regenerating naturally albeit checked now and then by burning. The condition – as an ancient coppice woodland – is unfavourable and maintained. There is no lichen interest here and no veteran trees. **The Bell's Copse fragment is part of the ancient Bell's Copse and is still ancient woodland albeit in very poor condition and with no old features seen.**

1 Introduction

Commission

- 1.1 Portsmouth Water Ltd commissioned a review of six parcels of woodland in the area in and around ‘Havant Thicket Reservoir Site’, Hampshire with the objectives of the work being to:

- Research and comment on their status as ‘ancient woodland’;
- Survey and assess the woodland lichen flora with comments on its conservation significance;
- Identify veteran trees; and
- Assess the condition of the woodland plots.

- 1.2 Fig 1.1 shows the location of the six woodland plots covered in this report. Four are named and two are not. For this report, the unnamed thin strip in the northern area is called ‘Blendworth fragment’ and the plot at the top of Bell’s Copse is called ‘Bell’s Copse fragment’. The area of the Corsican Pine Plantation is also called ‘The Triangle’ in the report text.

- 1.3 The full report on the lichens is provided as Appendix 1 with extracts/summaries given in this main report.

Version 5.0 of this Report

- 1.4 Version 5 of the report was updated on 26 June 2020. The changes to this report in comparison to the previous issued Version are:
- 1.5 Paragraph 4.5 and Fig 4.1 below Paragraph 4.5. The number of veteran trees given in Version 4.0 stated that there were 19 veteran trees in The Avenue. This is incorrect. The number of veteran trees is 18 (which correlates with the GIS database and the Lichen Report of Appendix 1) and this has been corrected in the text. The Fig 4.1 referred to in Para 4.5 has been changed to Fig 4.2 as there is an earlier Fig 4.1 in the report.
- 1.6 ‘Para 1. The Avenue’ in the Executive summary has been amended and now includes the identification of ‘eighteen’ veteran trees in The Avenue.

Background Reports

- 1.7 The proposed reservoir site has been studied over a number of years. The following reports from previous studies have been reviewed for this 2019 report:
- Sanderson, NA. 1994. Havant Thicket. Proposed Reservoir Site – Nature Conservation Value. For Hampshire Wildlife Trust;
 - Viney, T. 2012. Havant Thicket Winter Storage Reservoir Site: Site History Information;
 - ECOSA, 2012. Havant Thicket Winter Storage Reservoir. Ecology Report. Chapter B - Vegetation (Final Document, August 2012); and
 - Norton/ECOSA. 2019. Havant Thicket Winter Storage Reservoir, Rowlands Castle, Hampshire. Ecological Impact Assessment Report. Chapter C Vegetation Assessment. 3rd Draft. [Part of ECOSA Studies of Havant Thicket Winter Storage Reservoir Site].
- 1.8 The Sanderson report from 1994 is provided as Appendix 3. Note that since the 1994 report there have been changes in/evolution of, amongst others, the interpretation of the landscape, survey methods and guidance.

Site Location and Description

- 1.9 The area of study lies east of Waterlooville and west of Rowlands Castle, Hampshire. Upper Lake, approximately in the centre north (see Fig1.1 below) of the Havant Thicket Proposed Reservoir Site, is at grid reference SU714100.
- 1.10 Fig 1.2 shows the topography of the landscape and the location of the six woodland plots. Four plots, The Avenue, Middle Clearing, Round Wood and The Corsican Pine *Pinus nigra* plantation lie in a shallow 'valley' with several small watercourses gathering into a main stream that drains approximately southwards out of the site east of the base of Gammon's Hill. The western edge of this valley is defined by a ridge of c. 42m to 47m asl running approximately north-south from Gammon's Hill towards Bell's Copse and beyond. The Blendworth fragment and the Bell's Copse fragment are in a different catchment lying to the west of this ridge.

Fig 1.1: The location of the woodland plots are marked with red hatching. [Source Portsmouth Water Ltd]

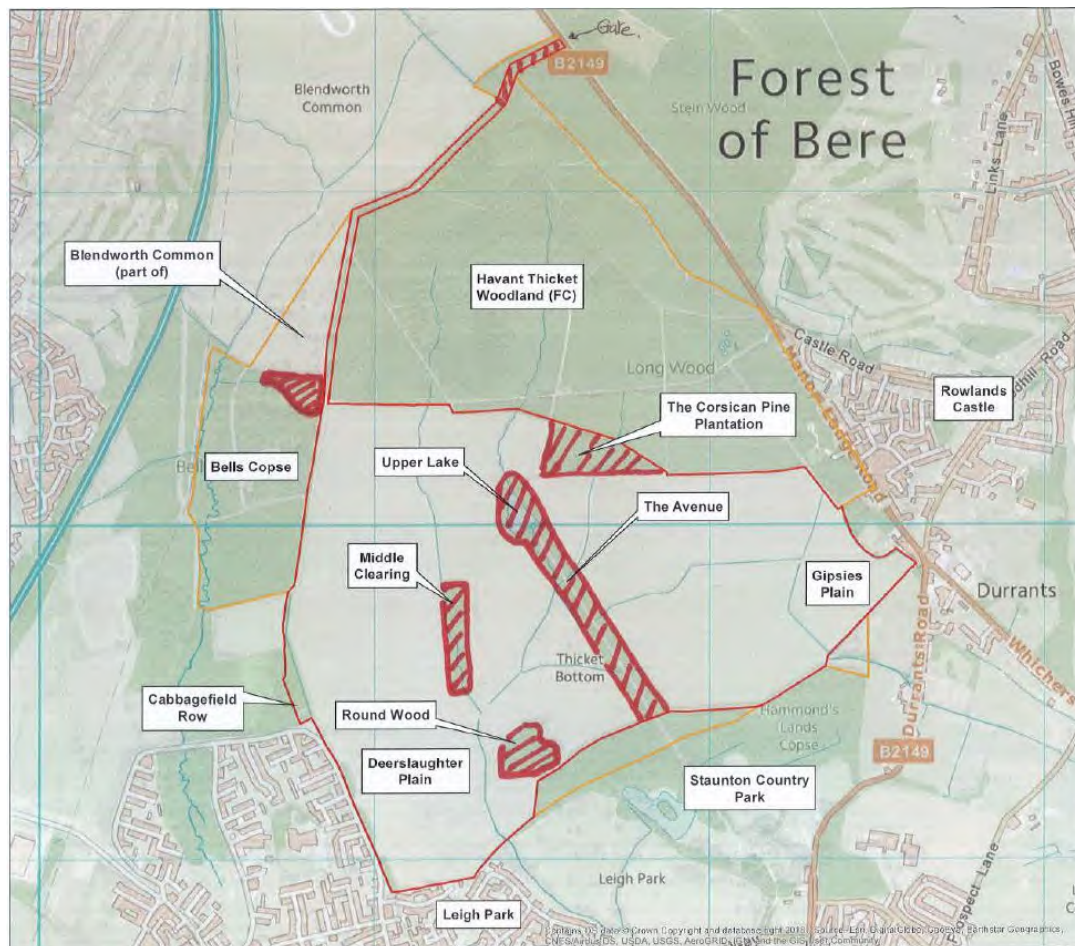
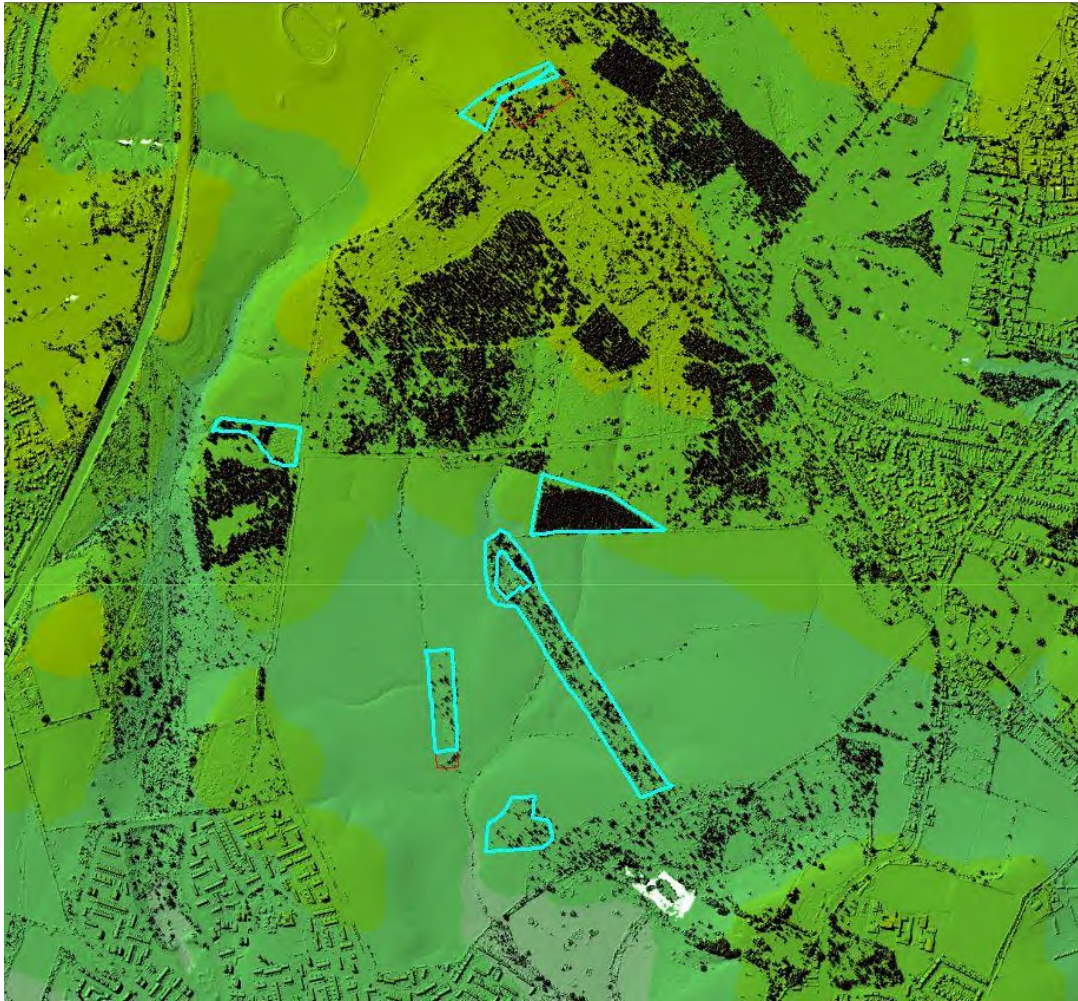


Fig 1.2: LIDAR image (Composite 2m DSM date unknown) showing tree canopy and topography of landscape with the six woodland plots outlined in blue. [Source: Environment Agency/OGL]



1.11 The Site is in the Hampshire Basin and the geological deposits – bedrock and superfcials - underlying this area has been mapped (at 1:50,000) by the British Geology Survey (BGS). The bedrock geology under the six woodland plots is:

- The Avenue: southern area is on London Clay (clay silt and sand); the northern area on the overlying London Clay (sand) the Lambeth group (clay silt and sand);
- Middle Clearing and Round Wood are both on London Clay (clay silt and sand);
- The Corsican Pine Plantation is on London Clay (sand);
- Bell's Copse fragment is on London Clay (clay silt and sand) though the western end is on London Clay (sand); and
- Blendworth Fragment is on Lambeth Group (clay silt and sand).

1.12 The BGS map shows that the bedrock geology in lower lying areas including the central area of The Avenue, Middle Clearing and Round Wood overlain with 'Head' deposits.

Overview of Landscape History

1.13 The six woodland plots shown on Figs 1.1 and 1.2 lie in three historic parishes:

- Havant Parish: The Avenue, Round Wood; Middle Clearing and Corsican Pine Plantation (The Triangle);
- Blendworth Parish: Blendworth fragment; and
- Bedhampton Parish: Bell's Copse fragment.

1.14 Historic parishes are particularly important in studies of ancient woodland as each parish will have had its own unique history with respect to land management and use, especially common lands and the rights associated with them (for example grazing, timber, pannage etc.).

Havant Parish

1.15 The areas that are now The Avenue, Middle Clearing, Round Wood, and The Corsican Pine Plantation (the Triangle) are all located in what was, before their enclosure, a pasture woodland complex on part of the common land or wastes of Havant parish. Certain people would have had the rights to resources on the common including grazing, timber, pannage and so on. Since late medieval times the Bishops of Winchester had the right to hunt on all or part of this area of common land and the area they had the rights to hunt in was called Havant Chase. Whilst the Bishops controlled the rights to hunt, the common rights were still exercised. Various places within the Common had local names and these can be seen on the County (1st edition) of the 25/6 inches to the mile OS map. Some are still in use today though not necessarily covering the same areas as the historic name did, for example Havant Thicket; others, for example, Loscott Plain and Burnholme Plain, have gone as names and places.

1.16 These common lands/wastes of Havant parish were enclosed in 1868 (Kain et al. 2004) and all common rights were extinguished. Following enclosure, land management was under the control of a single entity and they began substantial changes of land use very soon after.

Blendworth Parish

1.17 The Blendworth fragment is on the southern edge of the historic parish of Blendworth where it is adjacent to the boundary of the historic parishes of Havant and Idsworth. The Blendworth fragment was part of the much more extensive Blendworth Common.

- 1.18 The adjacent areas of Havant and Idsworth parishes to the south were also common land (until each was enclosed). Before enclosure, there would have been no physical boundary between the three allowing commoner's livestock (from any of the interconnected parishes) as well as wild animals (for example deer) relatively free movement between the areas. The commons of Blendworth (and Idsworth) were enclosed in c.1816 (Kain et al. 2004). Parish boundary banks were then built between Blendworth and Havant (and Idsworth - Havant) after enclosure and these are still present today. No boundary bank was built between Blendworth and Idsworth, the boundary marked instead by a line of posts.

Bedhampton Parish

- 1.19 The Bell's Copse fragment has a very different history to the woodland plots in the two parishes listed above. The main difference is that in rather than being common land and grazed pasture woodlands and rough grazing, the Bell's Copse fragment was part of an anciently enclosed landscape that has been managed since before the 1600s, as far as can be interpreted on the evidence used in this report, as a coppice woodland. A coppice woodland is a different ecosystem to a pasture woodland (see for example, Harding and Rose, 1993). The management by cutting poles/wood from coppice stools would produce phases of light and shade based on the coppice cycle practiced at the time (Rackham, 2003 and 2006). Grazing, if it occurred, played a lesser role in a coppice woodland in comparison to a pasture woodland. The habitat and conditions resulting from the coppicing provide conditions for certain ground flora and associated species that may not be present – or so prominent – in grazed pasture woodlands.
- 1.20 Bell's Copse was until the clearances of the 1970's a much larger woodland than is present today. Those clearances made the Bell's Copse fragment the northern edge of the modern Copse though for almost all of its life, the fragment lay well within the woodland. The original Copse was rich in ancient woodland vascular plant species (Sanderson, 1994) and many appear to still be present today (though we have no data specific to the area of the fragment).

Summary

- 1.21 Each of these three parishes have very different histories and management; Bell's Copse has been a coppice woodland for centuries whilst the Havant and Blendworth lands to its east were grazed as part of a common land and hunting land complex. The common rights on Blendworth ended in c. 1816 and those of Havant in 1868. Commoning rights on Havant and Blendworth commons would have been different from each other. The Bishops of Winchester had the right to hunt on Havant but not on Blendworth. Bell's Copse may have been part of a medieval park and this would have been managed completely differently to the common land. Bell's Copse itself - being a coppice - would have been managed in a distinctive manner (for example coppicing/felling of standards/grazing tightly controlled and tied into the coppicing cycle). The six plots investigated for this report are modified descendants of these three parish historical landscapes.

Status on Natural England's Inventory of Ancient Woodland (provisional)

- 1.22 The original survey and mapping of known and likely/potential ancient woodland sites was carried out on a county basis and published, generally, as a County 'Inventory of Ancient Woodland (provisional)'. For Hampshire, the first mapping (1988) was done in partnership between the ecology team of the Hampshire County Council (HCC) and the Nature Conservancy Council. This original provisional inventory was revised in 1995, again with HCC but this time in partnership with English Nature (HCC, 1995).
- 1.23 Each county produced its own inventory of ancient woodland (provisional) and these were written up as paper reports with maps showing woodland sites (e.g. for Hampshire see HCC, 1995). The maps from these reports were later digitised to form part of an amalgamated nationwide electronic provisional ancient woodland inventory available to view on the government's MAGIC (Multi-Agency Geographic Information of the Countryside) website. Since digitisation (likely with some amendments/errors at the time of digitisation) of the original county provisional inventory maps (HCC, 1995), there are ongoing, ad hoc revisions to the inventory to give the national map displayed on MAGIC.
- 1.24 There is significant difference between the original and latest versions of the provisional inventory for the six woodland plots covered in this report. Figs 1.3a and b show the original (1995) and latest (2019) versions respectively of the inventory. Table 1.1 below lists the status on the original and latest inventory for each of the six plots.

Table 1.1: Status of the six woodland plots on the original and latest revision of the inventory of ancient woodland (provisional and subsequent revisions).

Woodland Plot	Category on Inventory of Ancient Woodland	
	1995	2019
The Avenue	Ancient Semi-Natural Woodland	Ancient & Semi-Natural Woodland
Corsican Pine Plantation (The Triangle)	Ancient Replanted Woodland	Ancient Replanted Woodland
Round Wood	Ancient Replanted Woodland	Ancient & Semi-Natural Woodland
Middle Clearing	Unclear: could be either Ancient Semi-Natural Woodland or Not on Inventory	Ancient & Semi-Natural Woodland
Bell's Copse	Woodland cleared since the production of the First Series OS 1:25000 maps c.1920	Ancient Replanted Woodland
Blendworth Fragment	Not on Inventory	Ancient & Semi-Natural Woodland

Source: 1995 is HCC, 1995 and 2019 is MAGIC at gov.uk accessed November 2019.

Fig 1.3a: 1995 ancient woodland inventory (provisional) (from HCC, 1995). White within back line: ancient semi-natural woodland; hatching: ancient replanted woodland and cross-hatching: woodland cleared since 1920.

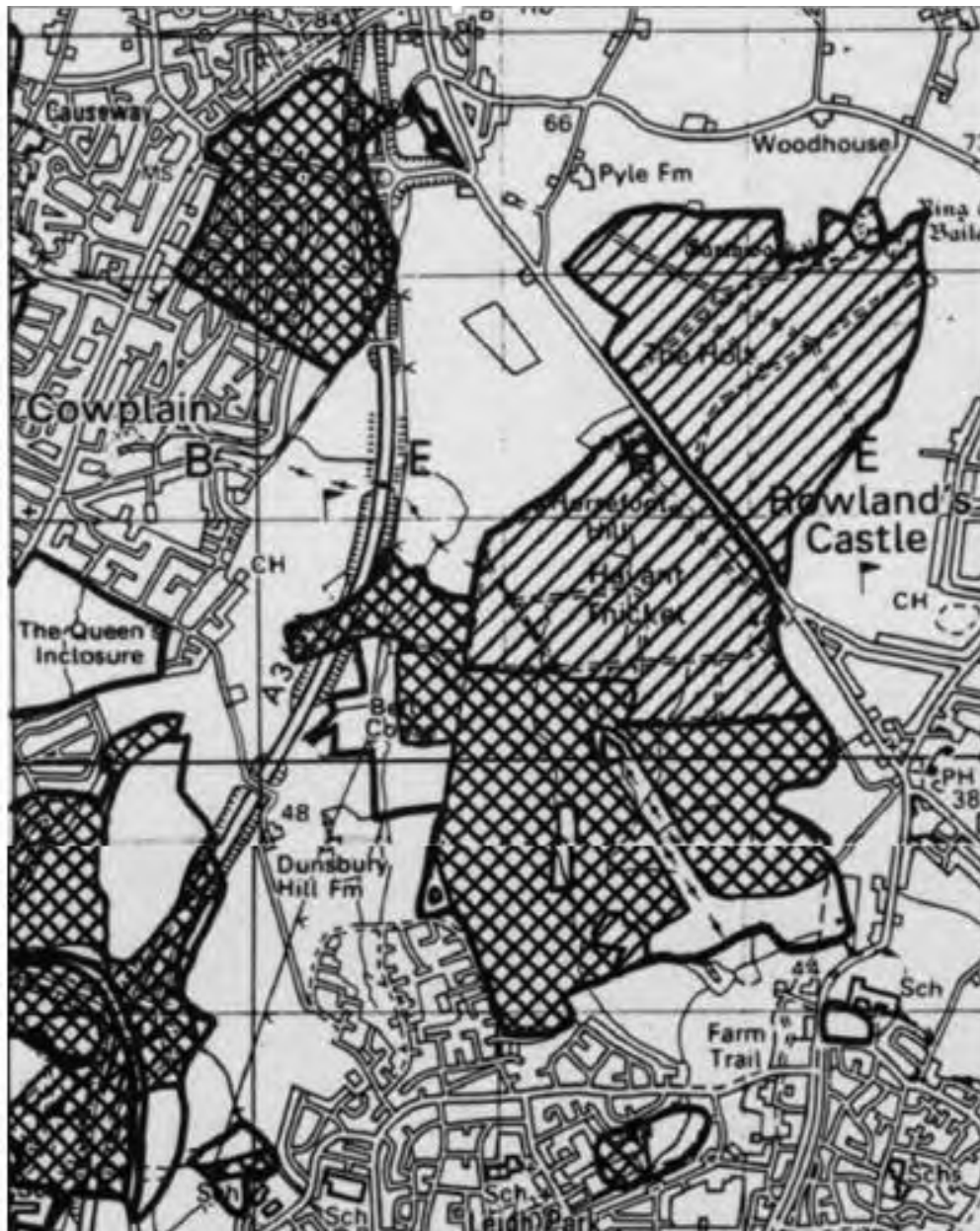
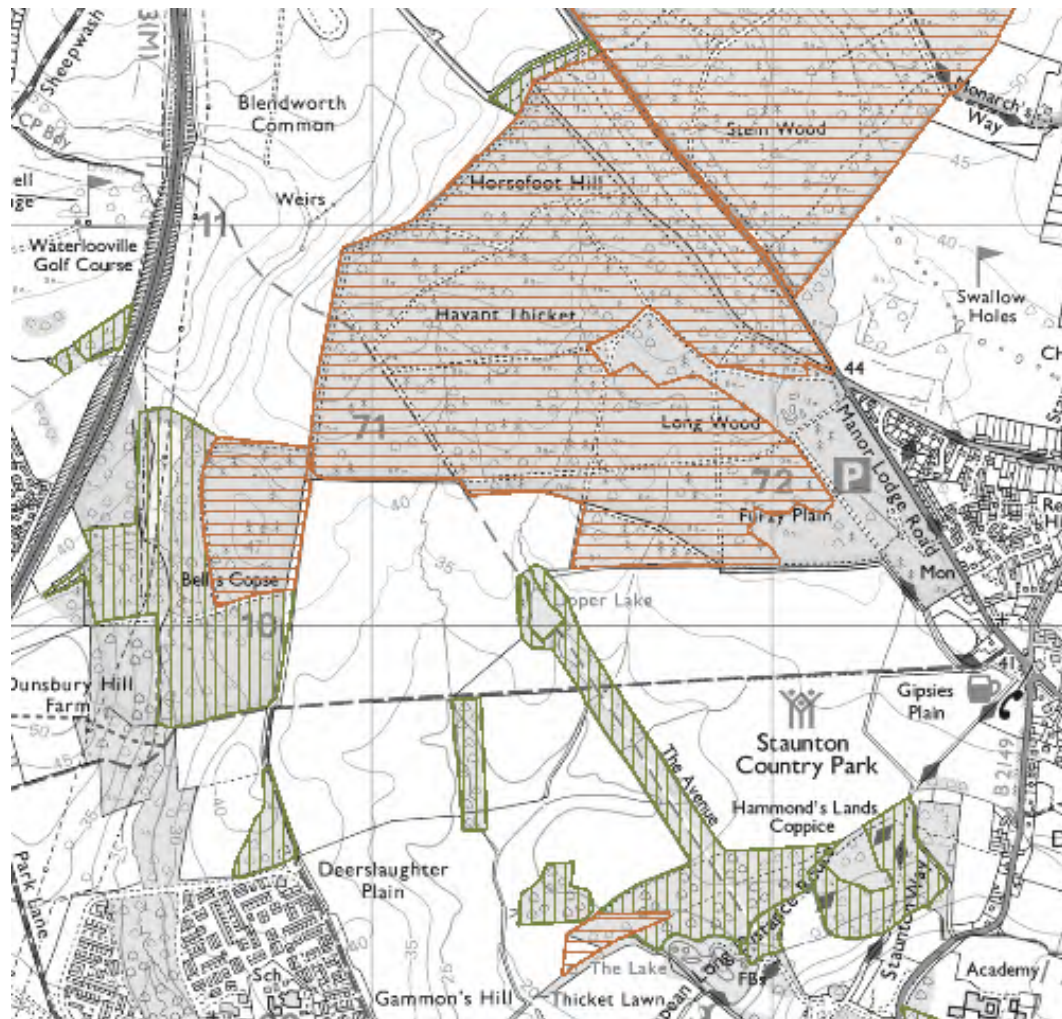


Fig 1.3b: ancient woodland inventory (revised provisional) for area covered in this report. Horizontal brown are Ancient Replanted Woodland (ARP) and vertical green is ancient and semi-natural woodland (ASNW). Accessed November 2019.



2 Methods

Introduction

2.1 This Methods section is sub-divided into the following:

- Reviewing Ancient Woodland Status;
- Lichen Survey and Assessment;
- Veteran Tree Definition; and
- Condition Assessment of Woodland Plots.

Reviewing Ancient Woodland Status

2.2 The review of the ancient woodland status makes reference to the following:

- Definition of Ancient and Recent Woodland;
- Criteria for the identification of provisional ancient woodland sites;
- Historic documents (primarily maps); and
- Results of Botanical Surveys (ECOSA, 2012 and 2019).

Definition of Ancient and Recent Woodland for the Inventory of Ancient Woodland

2.3 The concept of ancient/recent woodland and the Inventory of Ancient Woodland emerged in the late 1970s through work by, amongst others, Rackham and Peterken (Barnes and Williamson, 2015). George Peterken, in his Woodland Conservation and Management (1981 and 1993), summarised the concept of ancient/recent woodland - for practical purposes - as follows:

“Primary woodland is a useful hypothetical concept, not an identifiable state, so it is desirable to employ an alternative concept for practical purposes. A distinction is therefore drawn between ‘Ancient’ and ‘Recent’ woodland, defined according to their origins before and after a threshold date, respectively. The most convenient date for this threshold is about the year 1600 ..., because maps first become available and plantation forestry becomes important from about that time.”

2.4 Peterken’s description was the base for definitions and forms of ancient woodland that were given in the first provisional Inventories of Ancient Woodland reports (e.g. HCC, 1995 for Hampshire). Subsequent ad hoc revisions to the Inventory that have been published have provided revised descriptions of the definition of ancient/recent woodland and their various forms.

2.5 Natural England’s guidance definitions of ancient/recent woodland with respect to the Ancient Woodland inventory is given in its ‘*A Handbook for updating the Ancient Woodland Inventory for England*’ (Sansum and Bannister, 2018). The Handbook uses a 2014 definition of ancient/recent woodland that is from Natural England’s guidance on ‘*Ancient woodland, ancient trees and veteran trees: protecting them from development*’. The latest iteration of the Natural England guidance – 2018 – is given below as its current position on ancient woodland:

“Ancient woodland

Ancient woodland takes hundreds of years to establish and is defined as an irreplaceable habitat. It’s important for its:

- *wildlife (which include rare and threatened species)*
- *soils*
- *recreational value*
- *cultural, historical and landscape value*

It's any area that's been wooded continuously since at least 1600 AD. It includes:

- *ancient semi-natural woodland mainly made up of trees and shrubs native to the site, usually arising from natural regeneration*
- *plantations on ancient woodland sites - replanted with conifer or broadleaved trees that retain ancient woodland features, such as undisturbed soil, ground flora and fungi*

They have equal protection in the National Planning Policy Framework (NPPF).

Other distinct forms of ancient woodland are:

- *wood pastures identified as ancient*
- *historic parkland, which is protected as a heritage asset in the NPPF*

Many of these do not appear on the Ancient Woodland Inventory because their low tree density did not register as woodland on historic maps.

You should give consideration to wood pasture identified as ancient in planning decisions in the same way as other ancient woodland.

'Wooded continuously' does not mean there's been a continuous tree cover across the whole site. Not all trees in the woodland have to be old. Open space, both temporary and permanent, is an important component of ancient woodlands.'

- 2.6 The Natural England statement above needs some clarification in that it does not mention coppice woodlands. In brief, there are three basic 'forms' of ancient woodland: coppice woodland; pasture woodland (some of which is also called wood pasture) and parkland (where the parkland, or areas of the parkland, have a sufficiently high tree density). Note that all these forms can also be recent woodland.
- 2.7 As stated above, woodland may have come down to us from 1600 more or less intact –if so they are labelled as ancient semi-natural woodland (ASNW). If an original 1600 woodland has since been cleared and re-stocked with conifer or broad-leaved trees, the site could be considered as a plantation on an ancient woodland site (PAWS).
- 2.8 Both categories - ASNW and PAWS - are mapped on the ancient woodland inventory though note that PAWS are, on the inventory, labelled/called 'Ancient Replanted Woodland' (ARP). The inventory is available for public view on the government's MAGIC website.
- 2.9 Note that this simple two way division – ASNW and PAWS/ARP – is not clear cut: not all plantations on cleared sites are recorded as PAWS. Cleared sites that are planted with 'native' species –even if not of local provenance – are recorded and mapped as 'ancient semi-natural woodland'.
- 2.10 The ancient woodland inventory has always been, and remains, 'provisional'.

Criteria for identifying ancient woodland

- 2.11 Each of the six plots in this report have been reviewed against these Natural England criteria:

It's any area that's been wooded continuously since at least 1600 AD. It includes:

- *ancient semi-natural woodland mainly made up of trees and shrubs native to the site, usually arising from natural regeneration*
- *plantations on ancient woodland sites - replanted with conifer or broadleaved trees that retain ancient woodland features, such as undisturbed soil, ground flora and fungi "*

When does an ancient woodland cease to be an ancient woodland?

- 3.1 Many ancient woodlands have been affected by clearance for various purposes, including agriculture and conversion to plantations. With regard to the latter, the consequences for the ancient woodland ecosystem can range from negligible to severe (e.g. Rackham, 2006); some lead to the destruction of the ancient woodland and others don't. Whilst there are criteria for identifying ancient woodland, there are no objective or specific criteria to assess when an ancient woodland that has been cleared and replanted ceases to be an ancient woodland.

Historic Documents

- 2.12 The following are the main historic documents examined for woodland history:

- Map of Hampshire (Faden/Milne) 1791;
- Ordnance Survey Drawings 1806;
- 1st edition 1 inch to the mile OS 10 April 1810;
- Greenwoods Map of the County of Southampton 1826;
- Tithe maps c. 1840;
- 25/6 inches to the mile OS maps from the County Series (from the 1st edition surveyed in the 1860s to the final revisions in the 1930s;
- Land Utilisation Survey 1937; and
- Aerial imagery (for some of the plots 1946; 1954; 1960 and 1981).

Botanical Information

- 2.13 Botanical information used in the review is taken from the botany vegetation reports compiled by ECOSA as part of their studies into the proposed Havant Thicket Reservoir Site (ECOSA, 2012 and Norton/ECOSA, 2019). All six sites were visited by Sanderson and Cross in November 2019.

Lichen Survey and Assessment

- 2.14 The six woodland plots were scoped by the authors of this report for habitat that could support lichen species and communities of conservation interest. Areas with potential for these two lichen features were then surveyed in more detail searching for trees with lichens, targeting species of conservation interest, defined here as:

- species of national and local importance (RDB); and
- habitat quality indicators (in this location these are species listed on the Southern Oceanic Woodland Index [SOWI] – see SSSI Guidelines (Sanderson et al., 2018).

- 2.15 The lichen communities of conservation interest were identified in the field based on the surveyor's experience. Further details on the lichen survey and assessment methods are given in the Lichen Report in Appendix 1.

Veteran Trees: Definition and Survey

Introduction

- 2.16 An unexpected discovery during the 2019 lichen survey of the Avenue was finding Oaks *Quercus robur* older than the enclosure (c.1870) of Havant, i.e. pre-enclosure Oaks dating from the unenclosed pasture woodland. Until now, it was believed that all the Oaks in the Avenue post-dated the enclosure and that the oldest Oaks were those planted following enclosure.
- 2.17 The pre-enclosure Oaks are, in this report, considered to be ‘veteran’ trees and the rationale for this is set out below.

Definition of Veteran Trees as Recorded for this Survey

- 2.18 The definition and interpretation of ‘veteran’ trees for this report is based on surveyor experience and draws from the following documents:
- Rackham’s Trees and woodland in the British Landscape (1990);
 - Harding & Alexander (1993);
 - Law of Forests, Trees and Hedges (Mynors, 2011);
 - Lonsdale (2013); and
 - Natural England’s Guidance on Ancient Woodland (2018 revision).
- 2.19 Natural England has guidance on the protection of veteran tree (Guidance: Ancient woodland, ancient trees and veteran trees: protecting them from development at gov.uk, 5 November 2018) in the context of development and that guidance includes the following definition of veteran trees:

“Ancient and veteran trees

Ancient and veteran trees can be individual trees or groups of trees within wood pastures, historic parkland, hedgerows, orchards, parks or other areas. They are often found outside ancient woodlands. They are irreplaceable habitats with some or all of the following characteristics.

Ancient trees

An ancient tree is exceptionally valuable. Attributes can include its:

- *great age*
- *size*
- *condition*
- *biodiversity value as a result of significant wood decay and the habitat created from the ageing process*
- *cultural and heritage value*

Very few trees of any species become ancient.

Veteran trees

All ancient trees are veteran trees, but not all veteran trees are ancient. A veteran tree may not be very old, but it has decay features, such as branch death and hollowing. These features contribute to its biodiversity, cultural and heritage value.”

- 2.20 The veteran tree definition above means that veteran trees include ancient trees and some other younger trees – ‘*not all veteran trees are ancient*’ (see quote above); those veteran trees that are not ancient are younger trees with decay features. These younger veteran trees are called, in this report, ‘post-mature’ trees. The ‘flow-diagram’ below sets out our interpretation of veteran trees.



- 2.21 This characterisation is also covered in the lichen report in Appendix 1. It is based on ideas in Harding and Alexander (1993) and is also followed in Mynors in his ‘The Law of Trees, Forests and Hedges (Mynors, 2011, 2nd edition).
- 2.22 To expand a little on the above, we consider, broadly, that the mature phase corresponds to having economic value (as timber) and that the post-mature phase corresponds with the decline in its economic value as indicated by decay, damage, exploitation by birds, invertebrates etc. This process and the associated stages are described by Oliver Rackham in his *Trees and Woodlands in the British Landscape*’ (Rackham, 1990, revised edition) under his section on ‘The Longevity of Trees’:
- “Middle-aged and old trees are poorly understood. Foresters are concerned with trees in the first quarter, at most, of their life-span. Middle-aged trees are more difficult to understand - human life isn’t long enough – and have no commercial interest. The grower of an oak for timber will think about felling it as ‘mature’ at 100 years; after 150 years it becomes a store of capital increasingly at risk from decay; if still standing at 200 years it may be cut down on the plea that it is ‘dangerous’; but if left alone it may live to the age of 400 or much more.”*
- 2.23 The actual age that a tree goes through each stage, and for how long it persists in it, will vary according to, amongst others, location, genetics, species, changes in the abundance and composition of local animal populations etc. Given that this is a process, there can be no specific or precise ages, sizes or amount of decay/damage, etc. that can be used to define exactly when a tree becomes a veteran tree (which applies equally to when a post-mature tree becomes ancient).
- 2.24 Peterken and Rose (1993) set out some of the features associated with old trees in pasture woodland landscapes and research, surveying and interpreting this habitat is ongoing.

Veteran Trees and the NPPF

- 2.25 National Planning and Policy Framework (NPPF, 19 Feb 2019) follows the NE Guidance in part but defines a veteran tree the same as an ancient tree:

Ancient or veteran tree: *A tree which, because of its age, size and condition, is of exceptional biodiversity, cultural or heritage value. All ancient trees are veteran trees. Not all veteran trees are old enough to be ancient, but are old relative to other trees of the same species. Very few trees of any species reach the ancient life-stage.*

Irreplaceable habitat: *Habitats which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, taking into account their age, uniqueness, species diversity or rarity. They include ancient woodland, ancient and veteran trees, blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen.*

[Source NPPF 2019 pps 64 and 67 respectively]

Recording Pre-enclosure Oaks in the Avenue

- 2.26 Pre-enclosure Oaks in the Avenue were identified according to surveyor experience and the tree size (trees with a girth above 2.5m were considered) and architecture (trees with open crowns, trees with veteran features such as branch die back, rot holes etc.). Presence of lichen indicator species were also used but not all pre-enclosure Oaks had the indicator lichen species on them (mostly due to shade).
- 2.27 Locations of veteran trees were mapped using hand held Garmin 62/64. 10 figure grid references were recorded though the accuracy for this equipment means that the location recorded is likely to be in the region of +/- 10m for each location

Other Potential Veteran Trees

- 2.28 The five plots other than the Avenue were assessed and visited to check for the presence of veteran trees. Only one plot - Blendworth fragment – had old trees present and these are discussed in the results section.

Condition of Woodland Plots

- 2.29 There is no formal system – in Hampshire - to determine the condition of ancient woodlands that are not in a Site of Special Scientific Interest (SSSIs). The SSSIs have ‘Condition Assessment’ processes and these are reliant on the woodlands having formally identified and described features of interest with associated condition targets.
- 2.30 In the absence of a formal process, a subjective interpretation of the condition of the six woodland plots has been made and based on the original form of the woodland, its recent history and botanical data from ECOSA (ECOSA, 2012 and Norton/ECOSA, 2019).

3 Results: review of ancient woodland status

Introduction

- 3.2 This section considers evidence for the landscape history of the study area in the context of the two criteria that define ancient woodland: 1). was the site woodland in 1600 and 2) has that site been continuously wooded since then.

Ancient Woodland Criterion 1: was the site/area woodland in 1600?

Overview

- 3.3 There are no detailed maps from 1600 (or before) that depict the landscape of the study area and this is a feature common to ancient woodland studies. In lieu of maps from 1600, the Ordnance Survey drawing (OSD) - and its associated engraved Old Series 1 inch to the mile map – are the base maps used in this report for interpreting the potential for a woodland to have been present in 1600. An assessment of the OSD is set out below with the following map extracts:

- Fig 3.1: the OSD depicting the landscape in c. 1806;
- Fig 3.2: the 6 inches to the mile OS map from c. 1870 (used to show the relative accuracy of the OSD);
- Fig 3.3: the OSD georeferenced with modern street map to show Havant Thicket area in relation to the modern landscape;
- Fig 3.4: a comparison of the OSD with the 1791 Milne Map of Hampshire; and
- Fig 3.5: the engraved 1 inch to the mile OS map derived from the 2 inch to the mile OSD.

The Ordnance Survey drawing and the landscape in 1806

- 3.4 The Ordnance Survey drawing (OSD) that includes the Havant area is Sheet 82 (Blendworth) and is drawn at a scale of 2 inches to the mile. An extract from this OSD sheet is given in Fig 3.1 below. Named features on the OSD to help orientation are: Blendworth Common (north of the study area for this report); Bell's Copse (to the west) and Red Hill Brick Kilns to the east. The area that was to become known as Havant Thicket lies between these three though not known by that name at the time.

- 3.5 This drawing shows that the Havant Thicket area is a pasture woodland complex with trees and drifts. More open, habitat towards its eastern side near Red Brick Kiln. Drifts/glades spread through the pasture woodland (much as they do today in intact pasture woodland complexes such as the New Forest). It is clear from this drawing that the surveyors recorded the Havant Thicket area (in 1806 was common land/Havant Chase) as a pasture woodland complex.

Ordnance Survey drawing and the 6 inches to the Mile OS map

- 3.6 To give an idea of the relative accuracy of the OSD, an extract from the 6 inches to the mile map (one of the most accurate maps ever created) is given in Fig 3.2 for comparison. Whilst these are not the same landscapes because much enclosure happened between the two we can see details that are common to both: note, for example, the 'bite' out of the northern edge of The Holt; and note the pattern of less wooded/unwooded land and their drifts on the eastern side of the Thicket.

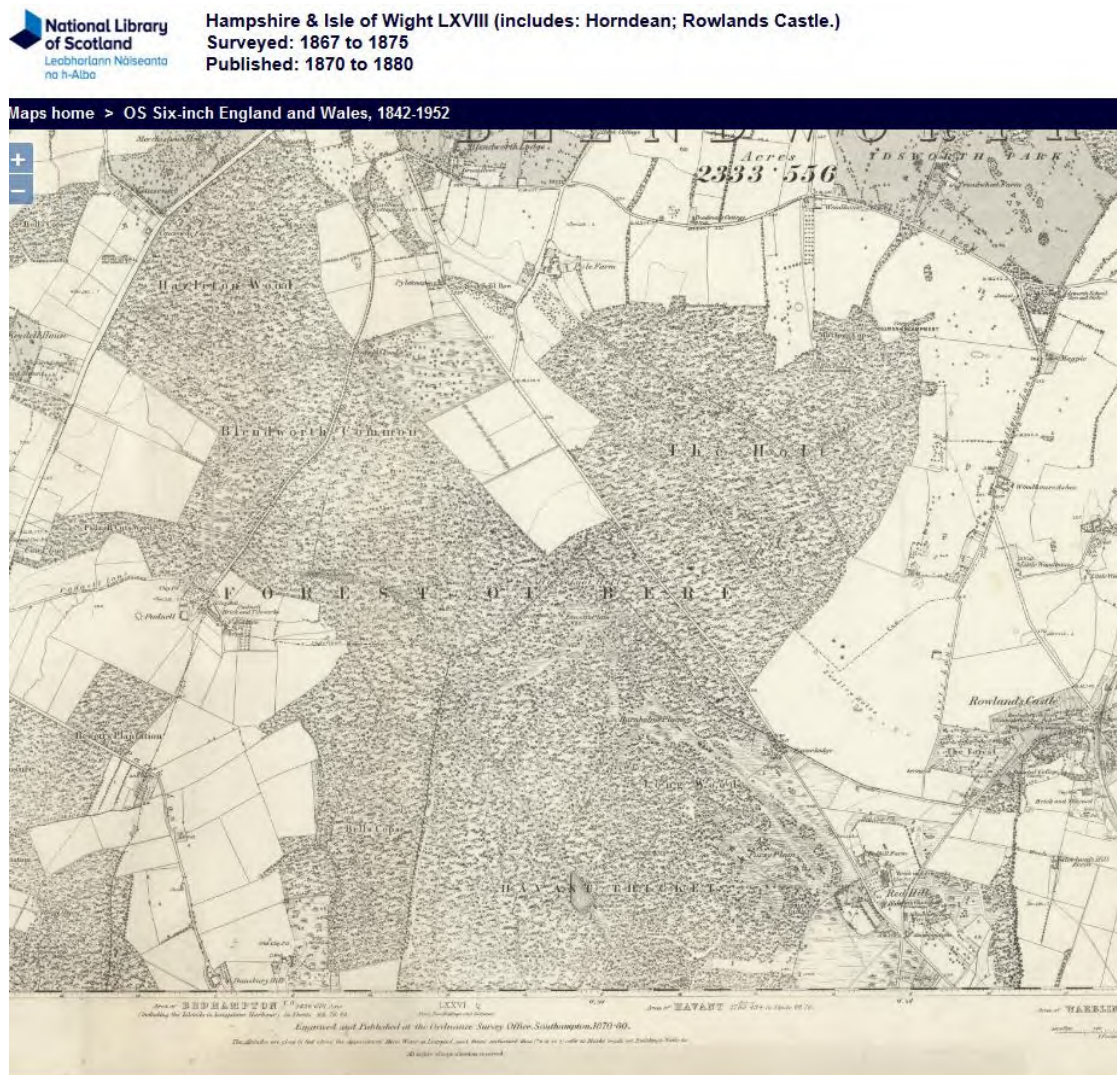
Fig 3.1: extract from the Ordnance Survey drawing Sheet 82 (dated 1806) showing the historic landscape of the Havant common/Havant Chase area and adjacent land, including Blendworth Common before its enclosure. Bell's Copse is named, as is Holt Wood. Other place names include 'Red Hill Brick Kiln' shown as an enclosed area (close to the area known as Gypsy Plain but which is not named on this map).



Map sourced from the British Library/Wikimedia Commons <https://commons.wikimedia.org>.

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Fig 3.2: extract from the Ordnance Survey 6 inches to the mile map (surveyed 1867 to 1875 and published between 1870 to 1880) showing Havant Thicket and the adjacent landscape (e.g. the enclosed Blendworth Common). Note that the legal 'Forest of Bere' had ceased to exist by this time.



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The Ordnance Survey drawing of 1806 over a modern Street Map

- 3.7 Figs 3.3a to 3.3d cover approximately the same area of landscape over and around the Havant Thicket area. Fig 3.3a is an extract from OSD sheet 82. This was georeferenced over the equivalent area of the Open Street map shown in Fig 3.3c. Figs 3.3b and 3.3d are the same figure and show the OSD laid over the top of the Open Street map but faded to allow details of both maps to be seen. The purpose of this sequence of paired figures 3.3a-b and 3.3c-d is to show the spatial relationship of the historic and modern landscape. One specific location - Upper Lake in the Avenue - is pointed at by the red arrow.
- 3.8 These maps show that all The Avenue, Middle Clearing, Round Wood, The Corsican Pine Plantation are within the historic pasture woodland complex of this landscape and that the Bell Copse fragment is within the ancient enclosed Bell Copse. The Blendworth fragment is located at the northern edge of the pasture woodland complex; given that it is such a small area of landscape, it cannot be certain whether it lay within pasture woodland or immediately to its north.

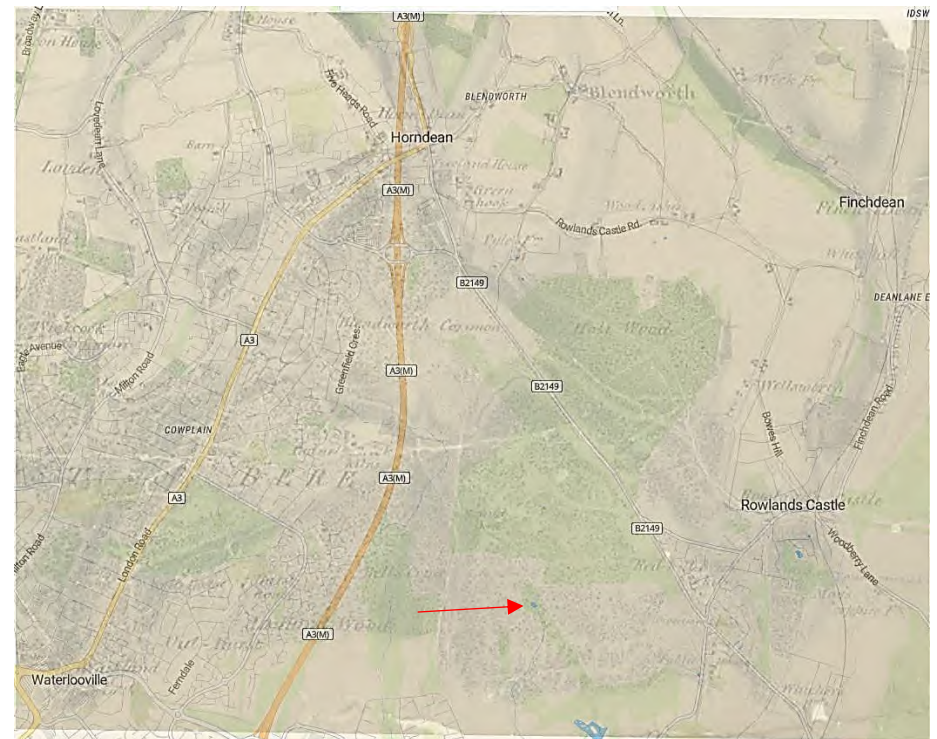
Figs 3.3a and 3.3b below show the same area of landscape. Fig 3.3.a is the OSD from 1806. Fig 3.3b is the OSD georeferenced and laid over the modern street map. The OSD has been faded to allow the modern features (e.g. the A3 (M) road).

The red arrow points to the Upper Lake at the northern end of the Avenue. Note that the upper lake did not exist at the time of the OSD in 1806

Fig 3.3a: Extract from Ordnance Survey drawing (OSD) Extract 1806.



Fig 3.3b: OSD georeferenced over Open Street Map.



OSD sourced from the British Library/Wikimedia Commons

<https://commons.wikimedia.org>.

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Figs 3.3c and 3.3d below show the same area of landscape. Fig 3.3c is the modern open street map. Fig 3.3d is the OSD georeferenced and laid over the modern street map. The OSD has been faded to allow the modern features (e.g. the A3 (M) road).

The red arrow points to the Upper Lake at the northern end of the Avenue. Note that the upper lake did not exist at the time of the OSD in 1806

Fig 3.3c: Modern Open Street Map used as the base for georeferencing the OSD.

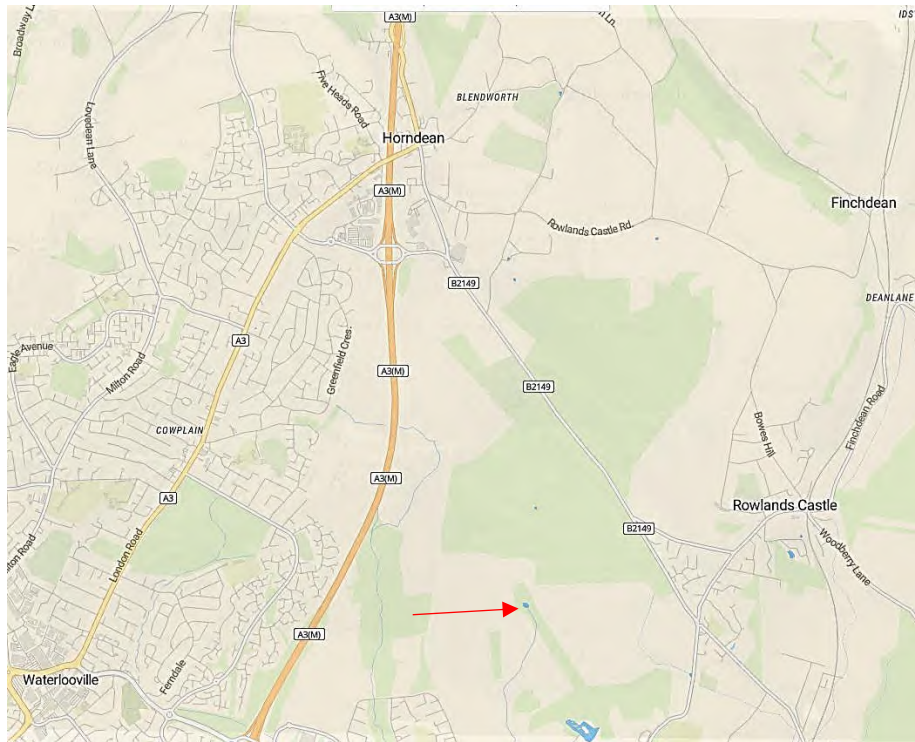
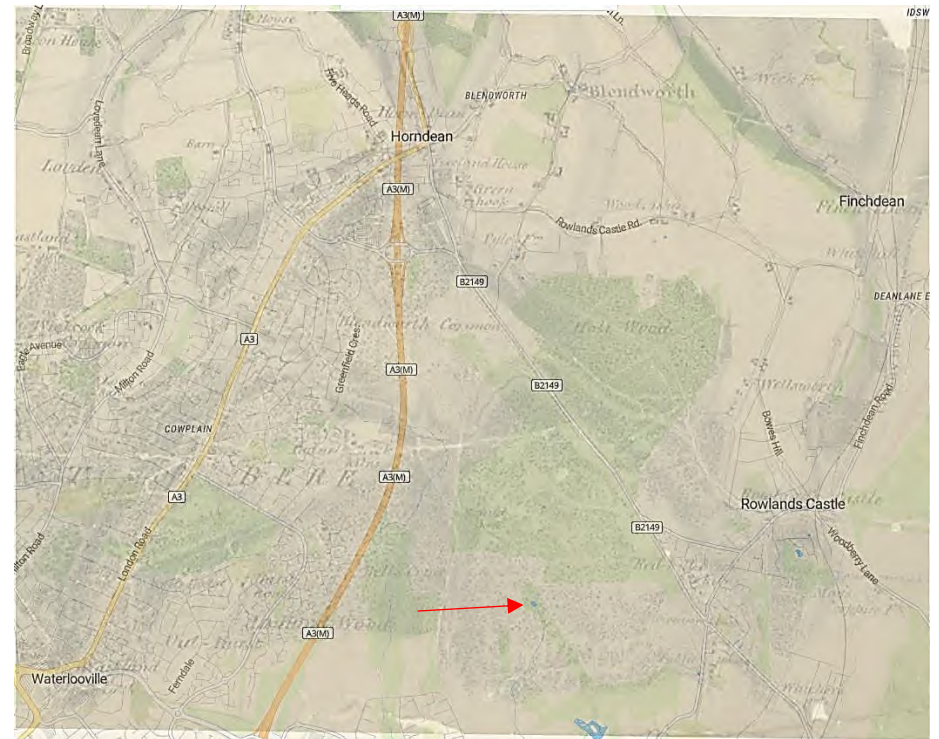


Fig 3.3d: The OSD dated 1806 georeferenced over Open Street Map (note that this fig is the same as Fig 3.3b above).



The OSD and the Milne Map from 1791

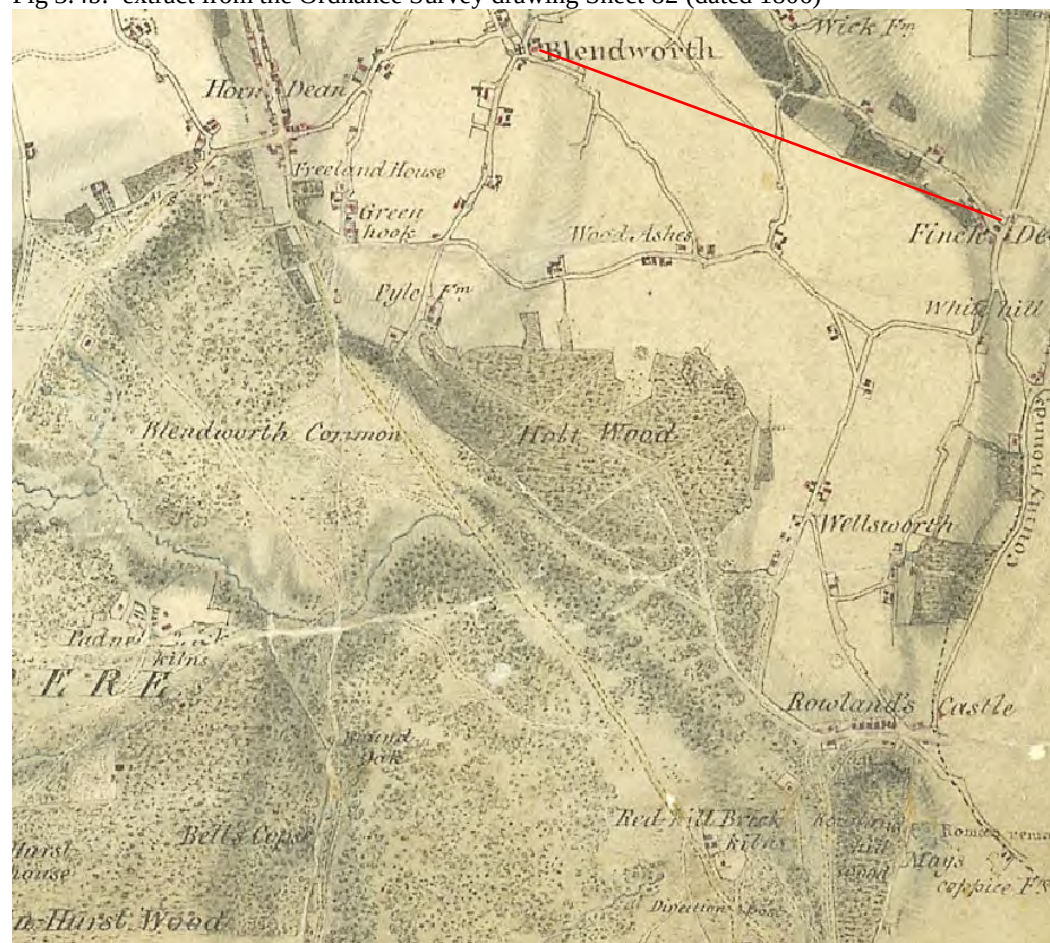
- 3.9 A map earlier than the OSD/1 inch to the mile OS exists; this is the Milne Map of Hampshire - its full title is '*HAMPSHIRE, or the County of Southampton, including the ISLE OF WIGHT. Surveyed by Thos. Milne in the years 1788, 89 & 90 executed and Published at the private expense of the Proprietor W. FADEN, Geographer to His MAJESTY, Charing Cross Decr. 20th. 1791*'.
- 3.10 The Milne map is a valuable map of the Hampshire landscape with much important information. The Milne map has been made available in superb quality at the 'old hampshire mapped' website (Norgate, 2006) and can be magnified many times way beyond its published scale of 1 inch to the mile. This capability to magnify can, however, draw us in to read or interpret too much in the landscape depicted by Milne. There is no readily available guidance on interpreting the Milne Hampshire map, though some guidance on its interpretation can be taken from MacNair and Williamson (2010) who examined and interpreted, in detail, the Faden/Milne for Norfolk (surveyed and printed just after the Hampshire map but similar in quality).
- 3.11 Given that the Ordnance Survey and the Milne map are so close in time to each other, 1791 and 1806, and that there were no massive changes to the landscape in this period, we can examine these maps together to try and understand what they are showing.
- 3.12 Figs 3.4a and b show a similar area of landscape from the Milne map and the OSD, respectively, at approximately relative scales, i.e. the OSD at 2 inches to the mile is twice the scale of Milne at 1 inch to the mile (the relative scale was set by the distance between Blendworth and Finchstead shown by the red bar in each map).
- 3.13 In comparing these two maps, we consider that the OSD is a more accurate portrayal of the landscape than the Milne Map. This is based in part on the larger scale of the OSD, that it was a drawing rather than an engraving and that the very accurate 6 inches to mile OS map correlates with the OSD. The Ordnance Survey had more resources than Milne and had different mapping objectives, each of which contributes to the OSD depicting a more realistic landscape than Milne.
- 3.14 That is not to say that Milne is wrong; we can say from his map that Havant Thicket is more wooded to the west and that it is unwooded/less wooded to the east –broadly what the OSD and 6 inches to the mile maps show. What we cannot tell from Milne is where that boundary is with any accuracy.

Fig 3.4a: Extract from Milne's Map of Hampshire (surveyed 1788, 89 & 90 and published in 1791.



© Martin and Jean Norgate: 2006

Fig 3.4b: extract from the Ordnance Survey drawing Sheet 82 (dated 1806)



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Fig 3.5a: Extract from Sheet 11 of the Old Series 1 inch to the mile OS map. Published 10th April 1810. Source: GB Historical GIS/University of Portsmouth, History of Havant in Hampshire | Map and description, *A Vision of Britain through Time*).



Fig 3.5b: Extract from Sheet 11 of the Old Series 1 inch to the mile OS map. Published 1810. Source Old Hampshire Mapped (Norgate, 2006). © Martin and Jean Norgate: 2006



The OSD (1806) and the Engraved 1 inch to the Mile OS map (1810)

- 3.15 The 1 inch to the mile OS map for the Havant area was compiled by collating information from the OSD (and other field data), reducing the scale to inch to the mile and then engraving the final map onto a copper plate for printing. This 1 inch map became Sheet 11 and was published on the 10th April 1810. An extract from this map is given in Figs 3.5a and b above. Two variants of the extract are shown – they are from the same engraving though the method of printing and reproduction makes them look different.
- 3.16 Though the OSD and the 1 inch have much detail and information in common (e.g. the roads) , there are differences owing, in part, to the different scales and the complexities of engraving copper plates versus drawing. Of particular relevance here is how the engraved map has had to simplify the complex patterns of the habitats on Havant Thicket area and Blendworth Common into a uniform symbol across applied to both Havant Thicket area and Blendworth Common – compare Fig 3.1 with 3.5.
- 3.17 The two extracts show how the engravers have had to ‘simplify’ the complex pattern of pasture woodland of Havant and the relatively treeless Blendworth Common as drawn on the OSD Thicket.

Summary: was the site/area woodland in 1600?

- 3.18 There are no maps dating to 1600 or before. We have interpreted the Ordnance Survey drawing (dated 1806), the Mile map (1791) and the land use pattern (e.g. the common lands of Havant and Blendworth Parishes) for the likely landscape in 1600.
- 3.19 The Avenue, Middle Clearing, Round Wood and The Corsican Pine Plantation areas were all originally within an ancient pasture woodland complex on Havant Common (this was the area largely known as Havant Chase and Havant Thicket). Pasture woodlands on commons are ancient habitats and would have been present there in 1600.
- 3.20 Bell’s Copse fragment, part of the larger Bell’s Copse, is assumed to have been an anciently enclosed landscape. Bell’s Copse is probably an ancient coppice woodland likely to have been present in 1600 (though of unknown age). No detailed information for the medieval composition of this area of Bedhampton Parish is available.
- 3.21 The Blendworth fragment is on the ancient common lands of Blendworth parish. Its habitat on the OSD is unclear (see Fig 3.1) – it may have been on the edge of a pasture woodland or it may have been heathy, rough grazing. It is impossible to say with any confidence whether the Blendworth fragment was woodland in 1600 or not – all we can say is that this area was certainly on ancient, uncultivated ground.

Ancient Woodland Criterion 2: has the site been continuously wooded since 1600?

Introduction

3.22 Evidence for this criterion included reviewing maps published after the since the Ordnance Survey drawing (OSD) of 1806 and its related 1 inch to the mile OS map (1810). Maps examined were:

- Greenwood's Map of the County of Southampton (1826);
- Tithe maps for Havant, Blendworth and Bedhampton (all c. 1840);
- The 25/6 inches to the mile map County Series from 1st edition to final revision (c. 1860s to 1930s); and
- Land Utilisation Survey of England (c. 1937).

3.23 Aerial photographs from 1946, 1954, 1960 and 1981 (in Viney, 2012) were examined and reproduced in Appendix 2 of this report. Note that not all areas are in all the images and that the Blendworth fragment lies outside of the areas of all the aerial photographs.

Woodland Plots in Havant Parish

Introduction

3.24 The pasture woodland in Havant parish continued until its enclosure in c.1868. Following enclosure, the pasture woodland was converted to a plantation, most likely all oak. Grazing was removed at this time though was reintroduced later (1970s?) when substantial areas of the plantations were cleared and converted to agricultural grasslands.

The Avenue

3.25 The Avenue was part of an ancient pasture woodland complex on Havant Common until c. 1870 when it was enclosed. The Avenue itself was created in the later part of the 20th century by removing all the oak plantation around it leaving 'The Avenue' as a long strip of woodland surrounding a central ride. The Avenue has probably not been grazed since the enclosure.

3.26 The Avenue has continued as a woodland habitat, modified by the inclusion of planted oaks and also the cessation of grazing, since enclosure and has remnants of the ancient pasture woodland in it.

Middle Clearing

3.27 The area that became known as Middle Clearing was part of the ancient pasture woodland of Havant Common until its enclosure. Following enclosure, the pasture woodland was cleared and 1895 revision of the 25 inches to the mile map shows that the area that was to become Middle Clearing as 'plain white' i.e. unwooded ground and not even rough grazing. The next revision – 1907 - shows Middle Ground area as a mixed woodland, which must have been planted between 1895 and 1907. The name Middle Clearing first appears on this 1907 revision.

3.28 The 1946 aerial shows the Middle Clearing as scattered trees and grassland habitat – but not cultivated land – and so the woodland depicted on the 1907 revision must have been partially harvested or failed. The 1954 aerial (Appendix 2) shows Middle clearing planted again and it is this woodland that is now present today. Middle Clearing has been used by cattle for grazing and shelter from (probably) the 1970s up to the present day.

3.29 There are no surviving ancient pasture woodland tree and shrub vegetation remaining. There is no ancient woodland ground vegetation surviving. The ground vegetation is species-poor grassland and dominated by species characteristic of fertile ground (see quadrat data and species lists in ECOSA, 2012). A few ancient woodland vascular plants (16 species – Norton/ECOSA 2019) are present in low numbers and in restricted locations (mainly stream sides and a bank).

3.30 Whilst this area was originally part of an ancient pasture woodland complex, the post-enclosure clearances, plantations and, later, modern cattle grazing/shelter have left almost nothing of the original ancient woodland ecosystem. What is present now is a c.70 year old oak plantation over a species-poor, fertile grassland with a few relict features present – what is present today is not an ancient pasture woodland.

Round Wood

3.31 The area that became known as Round Wood was part of the ancient pasture woodland of Havant Common until its enclosure. Following enclosure this area was cleared of its pasture woodland and converted to a broad-leaved (oak) plantation. The 1895 revision of the 25 inches to the mile map (c.1898) shows the future Round Wood as part of the extensive post-enclosure plantation and the same on the 1907 revision.

3.32 The 1946 aerial shows the area that was to become Round Wood as part of a larger area of a young broad-leaved plantation with some scattered older/larger trees. The post-enclosure woodland must have been harvested some years before 1946 and replanted. This larger area of young plantation was then itself largely removed leaving the odd-shaped area that is today called ‘Round Wood’. Round Wood is has been used by cattle for grazing and shelter since (probably) the 1970s until the present day.

3.33 There are no surviving ancient pasture woodland tree and shrub vegetation remaining in Round Wood. There is no ancient woodland ground vegetation surviving. The ground vegetation is species-poor grassland with dominated by species characteristic of fertile ground (see quadrat data and species lists in ECOSA, 2012). A few ancient woodland vascular plants (7 species – Norton/ECOSA 2019) are present in low numbers and in restricted locations.

3.34 Whilst this area was originally part of an ancient pasture woodland complex, the post-enclosure clearances, plantations and, later, modern cattle grazing have left almost nothing of the original ancient woodland ecosystem. What is present now is mostly a c.80-90 year old oak plantation, in which some of the larger trees may predate the main plantation, over a species-poor, fertile grassland with few relict features present – this is not an ancient pasture woodland.

Corsican Pine Plantation (The Triangle)

3.35 The area that is now called the ‘Corsican Pine plantation’ was part of the ancient pasture woodland of Havant Common until its enclosure. Following enclosure this area was cleared of its pasture woodland and converted to a broad-leaved (oak) plantation, as can be seen on the 1895 and 1907 revisions of the 25 inches to the mile OS map.

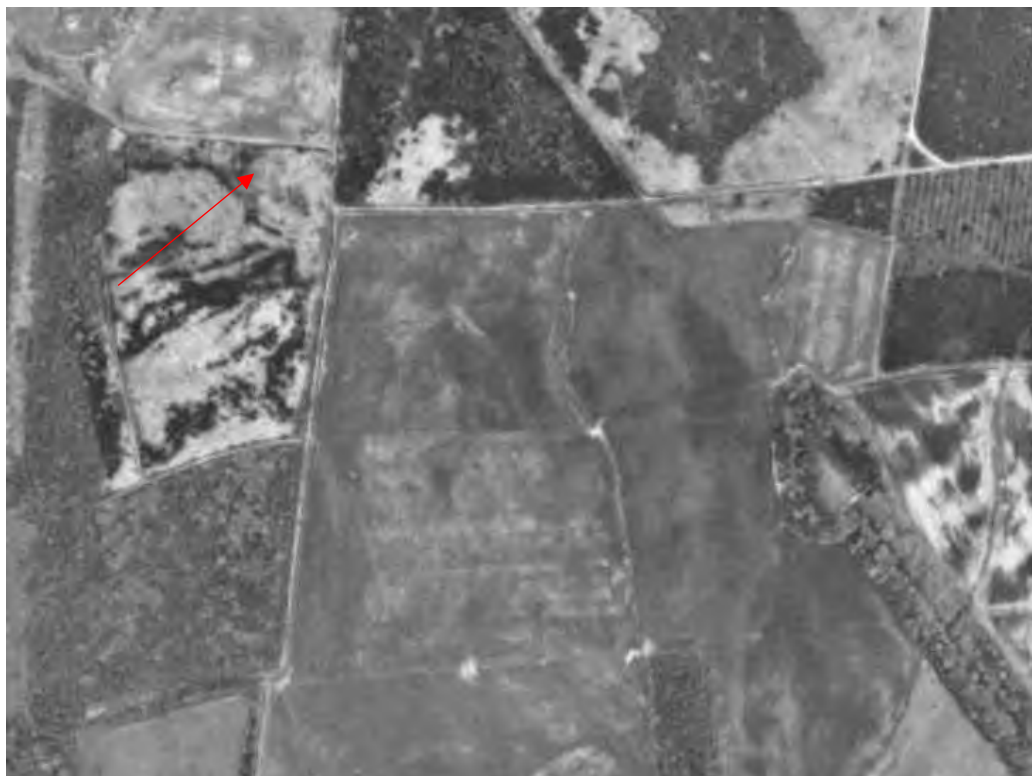
3.36 The 1946 aerial shows this area as broad-leaved plantation. The 1960 aerial shows the woodland seen in 1946 almost wholly harvested with the land shown as vegetated and not /bare ground. The 1981 aerial shows the Corsican Pine plantation has been established and that remains present to this day. This area was excluded from modern cattle grazing.

- 3.37 From the aerial photography, the felling between 1954 and 1960 removed the trees of the post-enclosure woodland but the ground flora and soil remained more or less intact. . It is not known what was done to this area to prepare it for the Corsican Pine plantation. .
- 3.38 This area has gone through some disturbance on at least three occasions - conversion of pasture woodland to oak plantation, felling and removal of the post enclosure woodland and preparation for and establishing a Corsican Pine plantation.
- 3.39 The plot is now a Corsican Pine plantation over a developing tree and shrub layer with a dense understory of Bramble-Bracken *Rubus fruticosus agg.-Pteridium aquilinum*. 16 ancient woodland vascular plants have been recorded from the area, albeit in limited numbers and distribution. Whilst there is no surviving ancient pasture woodland vegetation there is a relict flora. The ground cover indicates that the soils are less damaged than those in Middle Clearing and Round Wood. This area accords with the description of a PAWS – a plantation on an ancient woodland site with relict features.

Bell's Copse Fragment

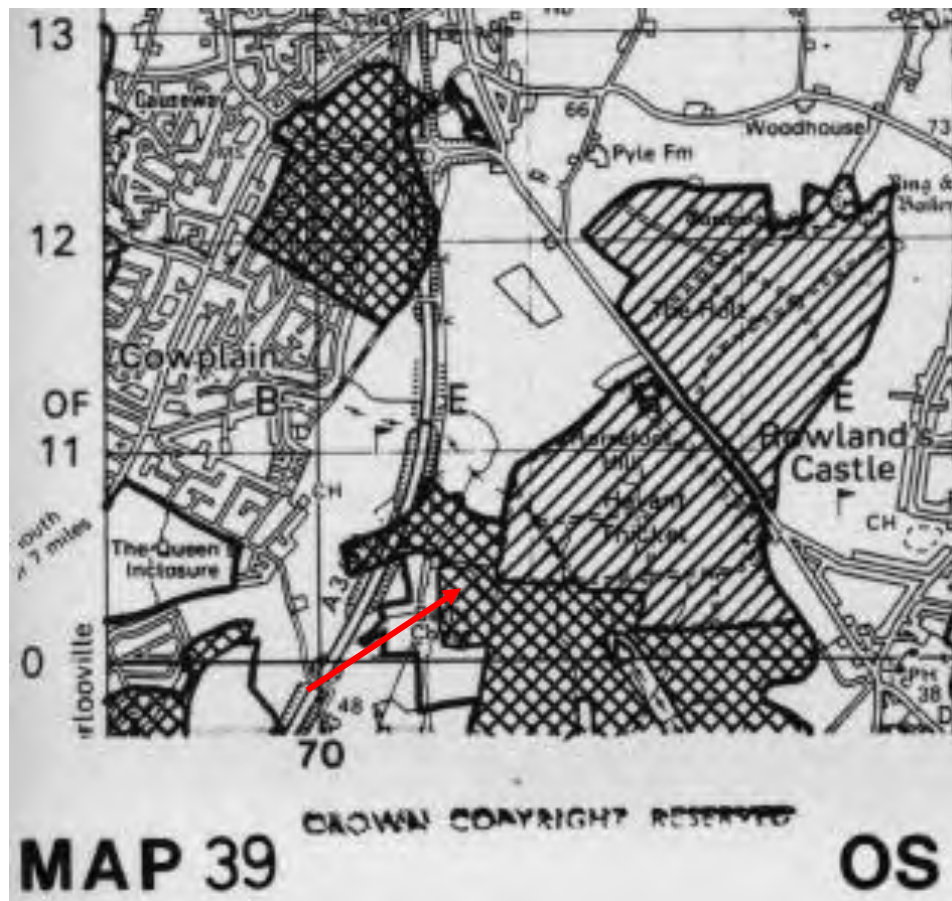
- 3.40 Bell's Copse fragment is shown on all editions of the 25/6 inch OS map (from 1860s up to the 1930s) as broad-leaved woodland and part of the larger Bell's Copse. It is also recorded as woodland on the tithe map (c. 1840). The 1960 aerial shows the Bell's Copse fragment still as woodland (trees and scrub) within the larger area of Bell's Copse. Not long after, however, in the 1970s, the Bell's Copse fragment, including the fragment, was cleared. An extract from a 1981 aerial photo shows the Bell's Copse area a few years after the clearance.

Fig 3.6: Extract from 1981 aerial showing clearance of Bell's Copse, including the Bell's Copse fragment (location indicated by red arrow).



- 3.41 Bell's Copse was considered for the original provisional ancient woodland inventory for Hampshire (HCC, 1995) but mapped as 'woodland cleared since the production of the First Series OS maps c. 1920' shown as cross hatching on the extract below in Fig 3.7.

Fig 3.7: Extract from 1995 provisional woodland inventory for Hampshire (HCC, 1995). Bell's Copse is shown as cleared woodland. Location of Bell's Copse indicated by red arrow.



- 3.42 Since the 1995 inventory, Bell's Copse has been added as an ancient woodland site under the Ancient Replanted Woodland (ARP) category - the reasons and grounds for this are unpublished.
- 3.43 Following the clearance in the 1970's, part of this area was planted with conifer. Scrub and heathland habitats established but succession to woodland has been constrained by a number of fires (presumed vandalism). The area is now with relict conifer trees, scrub and rank, heathy grassland communities. There is no detailed survey information on the flora of this area (recent information is for larger areas of the Copse).
- 3.44 Whilst there is little remaining of the original copse ancient woodland ecosystem - presumably it would have had old coppice stools and complex tree communities and complex ground vegetation. However, the species present and the type of communities regenerating (ECOSA, 2012 and Norton/ECOSA, 2019) indicate that the soil, whilst damaged, has not been fundamentally altered it. The Bell's Copse fragment is not now an ancient coppice woodland but does fit the description of a PAWS.

Blendworth Fragment

- 3.45 This plot is, on the Ordnance Survey drawing (1806), part of the common lands of Blendworth parish and its habitat then would have been either pasture woodland or more open, heathy grassland – it is not possible to say which on existing map evidence. Blendworth Parish was enclosed in c. 1814 and the Blendworth fragment with it. The tithe map of c. 1840 for this parish records the Blendworth fragment as part of a larger area with the state of cultivation as ‘rough’. Rough is interpreted here as being uncultivated land – but neither woodland nor pasture – that had no tithe (or had a nominal tithe). It is not known whether scattered trees would have been part of the ‘rough’ but it was not woodland.
- 3.46 The first edition of the 6 inch to the mile OS map shows the Blendworth fragment as a mixed woodland planted on the ‘rough’. This plot continues as woodland to the present day. The western half of the fragment has relict Sweet Chestnut stools that are survivors from the Victorian planting.
- 3.47 Whilst we know that the Blendworth fragment has been woodland since at least 1870, its listing as ‘rough’ on the tithe map (and uncertainty regarding whether it was in the pasture woodland or open heathy landscape on the OSD – see above) leave the origins of this plot relatively undetermined. The Norton survey (2019 for woodland W7), although not comprehensive, did not record a rich and complex ground layer typical of ancient woodland but instead recorded a relatively species-poor ground flora with few ancient woodland vascular plants.
- 3.48 The Blendworth fragment was not on the original Inventory (see Fig3.7) but has been added since as ‘ancient semi-natural woodland’. We do not know what grounds this has been on but if whoever revised the Inventory did it by looking at the 1870 1st edition 6 inch map (see Fig 3.2) and the 1810 1 inch to the mile OS map (see Fig 3.5) it would be understandable. If however you look at the 1806 OSD (see Fig 3.1), where the fragment appears to be on the northern edge of a pasture woodland, and the 1840 tithe information, where the fragment is described as ‘rough’ and not woodland, it is far from certain that this area was woodland in 1600 and remained continuously so since then.
- 3.49 What we seem to have here is a woodland (plantation) dating back with certainty to the mid-19th century. The OSD and tithe indicate non-woodland habitat at least in the early to mid-part of the 1800s though a few trees may have been present then (though not enough to record it as woodland on the tithe map). Bearing in mind that the area here has now been wooded for at least 150 years, the vegetation and flora now present (Norton/ECOSA, 2019) is not strongly indicative of an ancient woodland. Following the resources used in this report, the Blendworth fragment is, on balance, probably not ancient woodland.

4 Field Work Results

Lichen Survey and Assessment

Previous surveys at the Avenue

- 4.1 Neil Sanderson carried out a survey in 1994 (Sanderson, 1994) of the lichen interest of The Avenue and Thicket Bottom (area of woodland to the south of The Avenue). The summary of the lichen survey and assessment is given in Fig 4.1 below:

Fig 4.1: Extract from 1994 report (Sanderson, 1994) with Para 3.2 summarising the lichen interest of The Avenue and Thicket Bottom.

3.2 Epiphytes

A total of 25 lichen species, two mosses and two Liverworts were recorded from The Avenue and Thicket Bottom. The lichen flora in Thicket Bottom is somewhat depressed by the shade of the full canopy while that of The Avenue is more affected by air pollution due to its lack of shelter. The current flora is clearly recovering from past pollution as some pollution-sensitive species were seen. One small, stunted *Parmelia reticulata* thallus had the appearance of a recolonizing plant rather than a relic species.

In terms of ancient woodland species four species on Dr Rose's ancient woodland indicator list (New Index of Ecological Continuity - NIEC) [Rose 1992] were recorded. Two species *Schismatoma niveum* and *Arthopyrenia ranunculospora* were recorded only from the area to be flooded while the other two, *Athonia vinosa* and *Phaeographis inusta* was found on one old Hazel bush, the others on mature Oaks. Their distribution is shown on map 4.

This is not a high total and the species involved are ones which can slowly be recolonized woodlands after severe disturbance unlike more sensitive lichens which cannot be recolonized at all as far as is known. A total of 4 NIEC species is fairly typical of derelict coppices on ancient sites in South Hampshire.

- 4.2 Of these two areas, The Avenue was surveyed in 2019 with a summary of the survey results given below and the full report in Appendix 1). The results of the 1994 survey were used for the pre-survey research for the 2019 work and were included in the analysis and interpretation of the nature conservation value of The Avenue.

2019 Survey

- 4.3 A lichen survey, or scoping, was carried out on the 6 woodland plots by Neil Sanderson, with Andrew Cross, on 6th November 2019. The full report of the 2019 lichen survey is given in Appendix 1. The following is an extract from the report summarising the value, extent of interest and the nature conservation significance:

“Value of [The Avenue]

The Avenue scores nine using the Southern Oceanic Woodland Index (SOWI) for all data from 1994 and 2019, with a score of eight using the 2019 data only. These scores are well below the threshold for SSSI quality in the area, which is an SOWI score of 20. No threatened or Section 41 species were recorded. The Avenue includes at least nine veteran trees with lichen interest, which are most likely to originate as pre-enclosure trees (Table 2). There are also other similar older veteran trees but these are mostly too shaded to support lichen interest.

Table 2: Veteran Oaks with Lichen Interest in the Avenue

Tree Number	No. of lichen species of conservation interest
HT002	3
HT003	2
HT004	1
HT008	1
HT009	1
HT010	1
HT013	1
HT015	1
HT017	1

The assemblage and the veteran Oak that they grow on are a noteworthy feature inherited from the sites past as an old growth pasture woodland and is best regarded as a supporting feature of the county level interest of The Avenue as a surviving area of ancient woodland.

Extent of Interest

The results from Sanderson (1994) indicate that some lichen interest extends into the Thicket Bottom area south of the Avenue, but this area was not looked at in 2019. The 1994 results suggest that this was not the richest part of the site, and that the majority of the lichen interest is within the reservoir site.

Context in South East Hampshire

There is limited survival of lichen assemblages from the now lost pasture woodlands of the Forest of Bere and adjacent commons such as Havant Thicket ..., but some have been recorded. Queens Inclosure (SU6910) and Creech Walk (SU6411) have comparable assemblages with a total score of nine in the SOWI. Much richer, but more distant, is West Walk (SU6013) which scores 20 in total in the SOWI. The survival of moderately rich old woodland lichen assemblages from the [former Forest of Bere and attached commons] is rare, as far as is known, and The Avenue is one of only four significant sites recorded."

Pre-enclosure/Veteran Trees

The Avenue

- 4.4 Of the six plots examined in for this report, only the Avenue had old trees present. Most of these were identified during the lichen survey on the 6th November 2019 with a few additional trees identified on a second site visit by Andrew Cross on 17th November. All these trees were looked at in detail for lichen species and communities of conservation interest.
- 4.5 A total of eighteen (18) pre-enclosure trees were recorded. Of these 9 supported lichens of conservation interest, whilst the other nine trees had no lichens of conservation interest largely due to shade/and or ivy. These trees are shown as red and blue dots respectively on Fig 4.2 below.
- 4.6 These trees are probably in the earliest stages of the post mature/veteran stage of their life. Relatively few features of decay are present across the assemblage of trees though there is some branch die back, exposure of lignum, rot holes and saproxylic fungi present.

Blendworth Fragment

- 4.7 A moderately large Oak stub with a girth of 233cm is present on the Blendworth/Havant parish boundary bank. This was last cut some time ago and the poles are beyond their standard cycle. This tree is not a veteran tree but is a ‘character tree’ associated with a historical feature.

Photo 4.1: Oak stub (girth of stub is c.233cm) on historic parish boundary between Blendworth and Havant Parishes. Location approx. SU713113.



- 4.8 Note that there are a considerable number of Yews in Idsworth Parish, which, in this area, lies immediately to the south-east of the Blendworth fragment as well as some in the fragment itself. This population of yews has trees of various sizes and presumably ages. Given the longevity of yews, it is difficult to assess whether any of these are veterans - they do however form a distinct feature in the landscape and the oldest (in Idsworth) are likely to have some connection with the former pasture woodland landscape in this area. The yews in this part of Idsworth Common were surveyed by Norton and Milner (2012).

Assessment in a Planning Context

- 4.9 The National Planning Policy Framework (NPPF, 2018) introduces the term ‘exceptional’ for veteran trees. ‘Exceptional’ for the post-mature/veteran trees of The Avenue, means a population of trees in the earliest part of the veteran stage of their lives. Associated with this is that the trees have lichens – albeit a limited number of species - indicative of ecological continuity with old growth pasture woodlands. The exceptional nature of the woodland resource of The Avenue, including its trees and lichens – has been recognised as being of County Value.

Fig 4.2: location of eighteen pre-enclosure/veteran trees in the Avenue. A dot indicates a single tree; red dots (nine) are for trees with lichen interest (see Lichen report in Appendix 1) and blue dots (nine) are for trees without lichen interest.



5 Assessment of the Condition of the Woodland Plots

Introduction

Methods and Sources of Information

- 5.1 In contrast to the formal guidance on assessing legally designated sites (e.g. Sites of Special Scientific Interest), there are no equivalent methods and criteria that should be used to assess the condition of small, local woodlands with no national conservation designation (see also Methodology Section above).
- 5.2 The system used below is a subjective one and is here set out for guidance and discussion for the woodlands reviewed in this report only. The condition is assessed with respect to the historic woodland type (e.g. pasture woodland/coppice) and draws on information from the following:
- Landscape History;
 - Presence and type of semi-natural woodland communities;
 - Ground vegetation and presence of ancient woodland vascular plants;
 - Extent of disturbance to soil; and
 - The presence of veteran trees and lichens of conservation interest.
- 5.3 The condition of a woodland is summarised as favourable or unfavourable.
- 5.4 The detailed botanical work carried by John Norton/ECOSA (2012 and 2019) covered flora and vegetation for all the plots in this report. For ease of cross-referring, the plot numbers in the Norton/ECOSA (2019) report and the plot names are:
- W1 – The Avenue;
 - W2 – Middle Clearing;
 - W3 – Round Wood;
 - W7 - the Blendworth fragment
 - W11 - Corsican Pine Plantation (The Triangle); and
 - H1 - Bell's Copse fragment.
- 5.5 All these locations are shown on the ECOSA Map C6 - Target Notes and Broad Vegetation Areas (Norton/ECOSA, 2019).
- 5.6 Each of the six woodland plots were visited in November 2019 by Sanderson and Cross. Field observation of the condition of the woodlands were made and these were later used in conjunction with the results from the detailed botanical work carried out by ECOSA/Norton (2012 and 2019) as well as Sanderson's earlier work on the Site (Sanderson, 1994).

Landscape History

- 5.7 Information on landscape history is based on the work and references given in this report. The condition of the modern wood is considered with respect to its historic woodland type.

Presence of semi-natural woodland communities

- 5.8 For woodland communities, we refer, where appropriate, to Peterken Stand Types (PST) (Peterken, 1993) and woodland communities described in the British Plant Communities Vol 1 Woodlands and

scrub (Rodwell, 1991). The condition is considered with respect to the semi-natural stands of the ancient woodland origin of the plot.

Ground vegetation and presence of ancient woodland vascular plants

- 5.9 Information for the condition assessment from here includes consideration of whether the ground vegetation (with its associated ancient woodland vascular plants) is referable to ancient woodland types or not. Information on the presence and abundance of ancient woodland plants in the four woodland in Havant parish is taken from Norton/ECOSA (2019) and reproduced in Table 5.1 below.

Extent of disturbance to soil

- 5.10 No detailed work on soils but plot history and land use collated to give an overview of soil disturbance then used to contribute information as to the condition of the plot.

The presence of veteran trees and lichens of conservation interest

- 5.11 Given the history of ancient pasture woodland ecosystems in this area that would have had veteran trees and a diverse lichen flora, these two features are also considered in the condition, where appropriate, of the plots.

Table 5.1: Copy of Table C1 (Summary of on-site ANSW and PAWS woodland in relation to ancient woodland indicator species) from Norton, 2019. Note that for this table, the areas of the plots have been rounded up and that the Avenue area has been changed by splitting the woodland from Upper Lake and by excluding the central ride (made ground).

Woodland Block	Ancient Woodland Indicators	Size (Hectares)	Habitat Description and Summary Evaluation
The Avenue	37: 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	c.6.2 ha (excluding the central track which is made ground)	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... 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.
Upper Lake (in the Avenue)		0.65	The pond margins support rushes and wetland species
Middle Clearing	16: Abundant 2, Frequent 1, Occasional 2, Rare or R/LF 11; no bluebell observed	c. 2.2 ha	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 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: Abundant 0, Frequent 1, Locally Abundant 0, Locally Frequent 0. Occasional 2, Rare or R/LF 4; no bluebell observed	c. 2ha	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.
Corsican Pine Plantation (The Triangle)	16: Abundant 0, Frequent 0, Locally frequent or abundant 3, Occasional 2, Rare or R/LF 11, bluebell rare	c. 3.6 ha	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. 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.

The Avenue

- 5.12 The Avenue is a complex woodland habitat though one that is a far less diverse now than when it was a pasture woodland on the unenclosed Havant Common (Havant Chase/Havant Thicket). Examples of what has been lost include; grazing and all its associated influences on the pasture woodland ecosystem (trees, ground flora, regeneration, shade etc.); simplification of woodland structure (no glades or drifts with scrub edges); reduced tree competition; reduced range of tree ages; limited survival of old growth epiphytes etc.

Table 5.2: Features of The Avenue

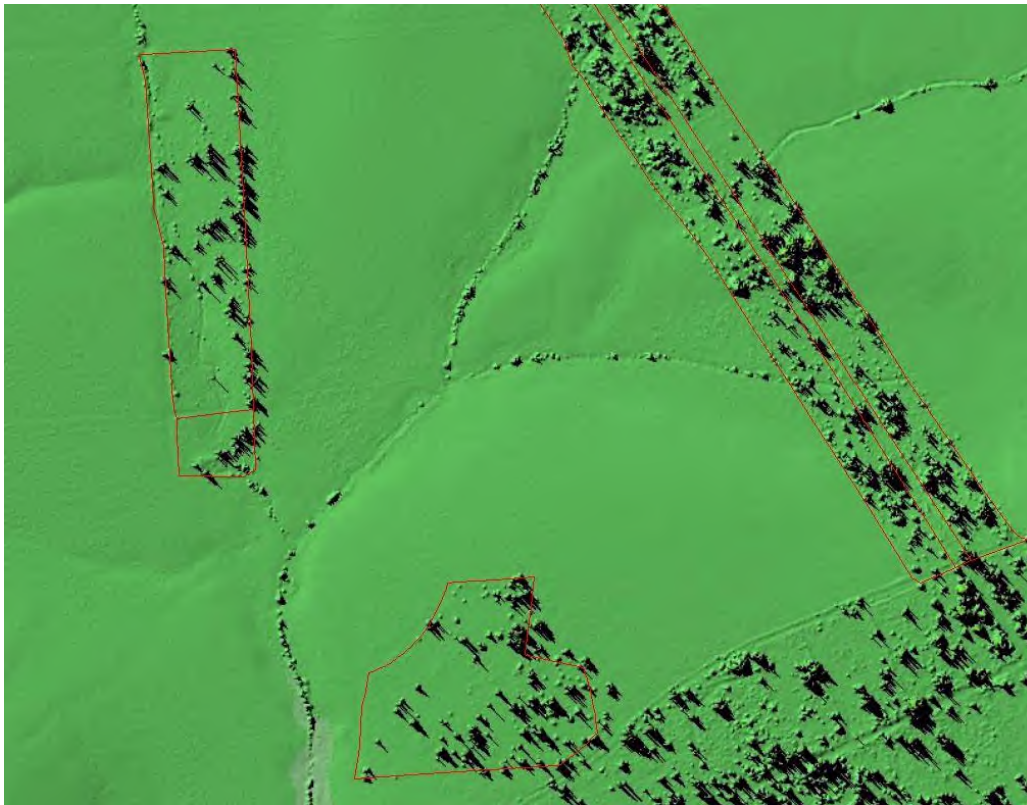
Feature	Comment
Landscape History	Descended from an unenclosed pasture woodland ecosystem and though modified still has relict pasture woodland features. Relict trees and ground flora present. Locally modified by Victorian planting of Black Pine and Oak. Ungrazed (since 1870?).
Presence of semi-natural woodland communities;	Recognisable Peterken Stand Types present (e.g. 6Dc and 6Db Lowland Hazel-Oak and Birch-Oak respectively (Sanderson, 1994) and NVC woodland communities derived from ancient pasture woodland.
Ground flora and ancient woodland vascular plants	37 AWVP species recorded. A shaded, ungrazed ground vegetation that is in places bare ground or otherwise largely dominated by Bracken-Bramble
Extent of Disturbance to soil	The soils here appear to be relatively undisturbed other than adjacent to Upper Lake and the main track, the latter which appears to be composed of imported material.
Lichens and Veteran Trees	19 pre-enclosure trees (veteran trees) were recorded by Sanderson and Cross in 2019. Lichen species indicating ecological continuity with the pre-enclosure ancient pasture woodland ecosystem occur in The Avenue (see Lichen report in Appendix 1).

- 5.13 The Avenue is now an ungrazed, little managed woodland with a ‘high forest’ structure. Much of the woodland ground layer is shaded suppressing the abundance and diversity of the ground flora. Where light gets through, Bracken –Bramble scrub is locally prominent, again affecting the ground flora. Localised patches of dense regeneration of trees and shrubs shades the lower trunks of mature trees.
- 5.14 The Avenue is in unfavourable condition and that condition will be maintained for the foreseeable future in the absence of specific management.

Middle Clearing

- 5.15 This area of former pasture woodland is now a near monocultures of youngish (c.70 years), planted oak trees. The ground flora is one of an herb-poor agricultural grassland rather than a woodland ground flora and vegetation composed of forbs and with few ancient woodland vascular plants prominent. The grassland is dominated by Common and Creeping Bents and Rough Meadow-grass. The species-poor grassland that dominates most of this woodland floor is probably a result of cattle using the area for grazing and shelter over the past decades.

Fig 5.3: Middle Clearing and Round Wood over LIDAR 1m/2m DSM.



- 5.16 Norton describes the vegetation of the Middle Clearing as:

“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. ... 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 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.”*

Table 5.3: Features of the Middle Clearing

Feature	Comment
Landscape History	Originally part of an unenclosed pasture woodland ecosystem. This strip of land was cleared after 1870 and shown as a treeless plot on the 1895 OS 25 inch map. The 1907 OS 25 inch map shows it as a mixed woodland that must have been planted soon after 1895. This mixed woodland was thinned/cleared (or possibly failed) by 1946 (see Appendix 2 for aerial photo) and then planted up as an oak plantation by 1954. Grazed and used for shelter by cattle (from unknown date, possibly the 1970s) to the present day.
Presence of semi-natural woodland communities	There is no recognisable Peterken Stand Types present and no old semi-natural NVC woodland community in the canopy, shrub or ground layer.
Ground vegetation and ancient woodland vascular plants	The woodland present is a plantation over a fertile, species-poor grassland rather than a woodland vegetation. 16 AWVP species recorded with varying degrees of abundance though most are rare and not part of a woodland community.
Extent of Disturbance to soil	Soil will have been disturbed when the pasture woodland was cleared and the various plantations established. How extensive this has been is difficult to tell because of the influence from the cattle grazing. .
Lichens and Veteran Trees	There are no veteran trees in Middle Clearing and there is no lichen interest.

- 5.17 There is very little surviving of the ancient pasture woodland to assess its condition. The current woodland - a plantation - is in unfavourable condition as a woodland because of, for example, the lack of diversity in the woodland canopy, the near absence of a shrub layers, and the ground flora being largely a fertile, species-poor herb-poor grassland.
- 5.18 Intensive use of the Clearing by cattle has led, or contributed significantly, to the development of grassland ground vegetation rather than a woodland ground flora. In the absence of any specific management, the unfavourable condition of Middle Clearing will continue into the foreseeable future.

Round Wood

- 5.19 This area of former pasture woodland is now a young oak plantation with a sparse holly *Ilex aquifolium* understory. In contrast to Middle Clearing, which is a younger, more uniform oak plantation, there is some difference in the sizes of the oaks here. The largest of the oaks was about 2.30m girth but these larger trees were not common. Most of the oaks were a lot smaller at about 1.5m girth. The different sizes in the canopy can be seen on the 1954 aerial in Appendix 2
- 5.20 The ground vegetation in Round Wood is one of a fertile, species-poor agricultural grassland rather than one of woodland vegetation. The grassland is dominated by Common Bent, Cock's-foot, Rough Meadow-grass and Yorkshire Fog (see Norton 2019) with few other herbaceous species. Ancient woodland vascular plants are generally rare with 7 species recorded.
- 5.21 Norton (2019) describes the vegetation of the Round Wood as:
- “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....*
- 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.”*

Table 5.4: Features of Round Wood

Feature	Comment
Landscape History	Originally part of an unenclosed pasture woodland ecosystem though little, if none, of that is present today. The pasture woodland was cleared after 1870. Round Wood was created between 1946 and 1954 by cutting its shape out from a more extensive young plantation. Grazed by cattle (from unknown date, possibly the 1970s).
Presence of semi-natural woodland communities	No recognisable semi-natural NVC woodland community or Peterken Stand Types present. The woodland present is 'artificial' in that it is a plantation over a highly modified woodland ground flora that is a species-poor grassland vegetation rather than a woodland vegetation.
Ground vegetation and ancient woodland vascular plants;	7 AWVP species present growing amongst a fertile herb-poor pasture
Extent of Disturbance to soil	Soil will have been disturbed when the pasture woodland was cleared and the oak plantation established. How extensive this has been is difficult to tell because of the influence from the cattle grazing. .
Lichens and Veteran Trees	There are no veteran trees in Round Wood and there is no lichen interest.

- 5.22 Round Wood cannot be assessed for the condition of its ancient pasture woodland as almost nothing remains of that; what is assessed here is the recent oak plantation. Round Wood is in unfavourable

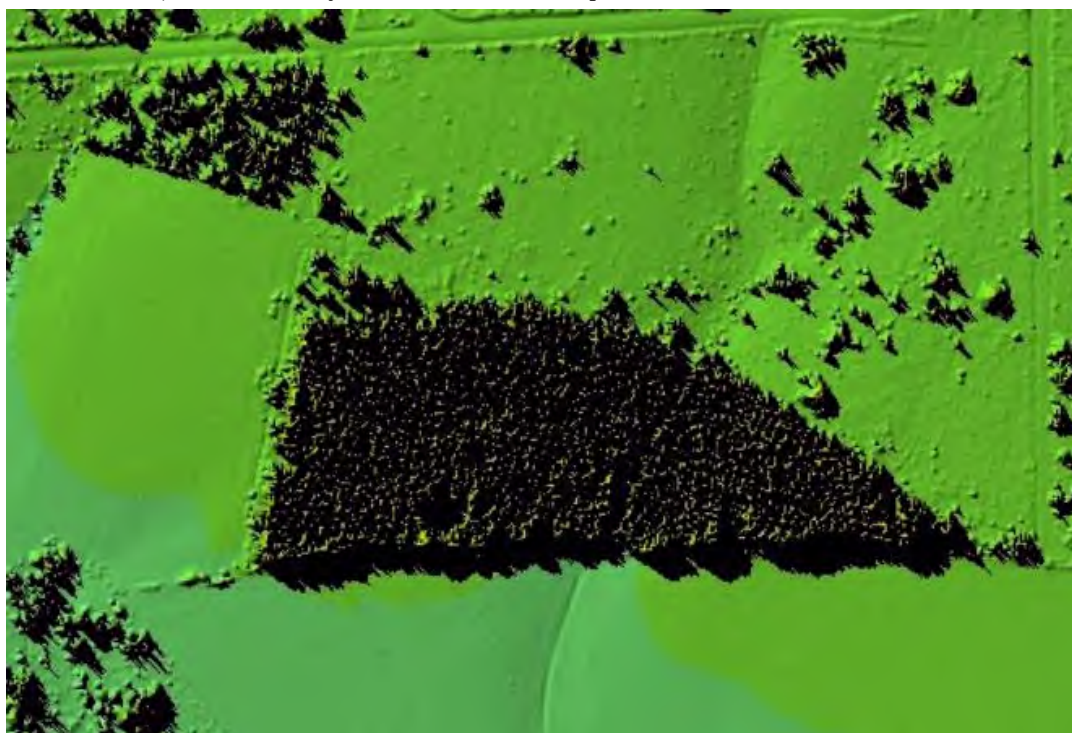
condition as a woodland because at present it seems to be little more than a stand of single-age oaks (almost all planted at the same time) over a species-poor grassland. There is no diversity in the canopy and the shrub layer is both very sparse and species-poor. The ground flora - a fertile, species-poor grassland - is not an ancient woodland community.

- 5.23 The ongoing, intensive use of Round Wood by cattle means that unfavourable condition of Round Wood will continue into the foreseeable future.

Corsican Pine Plantation (The Triangle)

- 5.24 This former pasture woodland is now a dense Pine plantation dominated by non-native trees.

Fig 5.4: The Corsican Pine Plantation (Triangle) over LIDAR 1m/2m DSM (source: EA/OGL 3.0. Date unknown). Predominantly a dense Corsican Pine plantation.



- 5.25 Norton (2019) describes the vegetation of the plot as:

“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 ...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

Table 5.5: Features of The Corsican Pine Plantation (The Triangle)

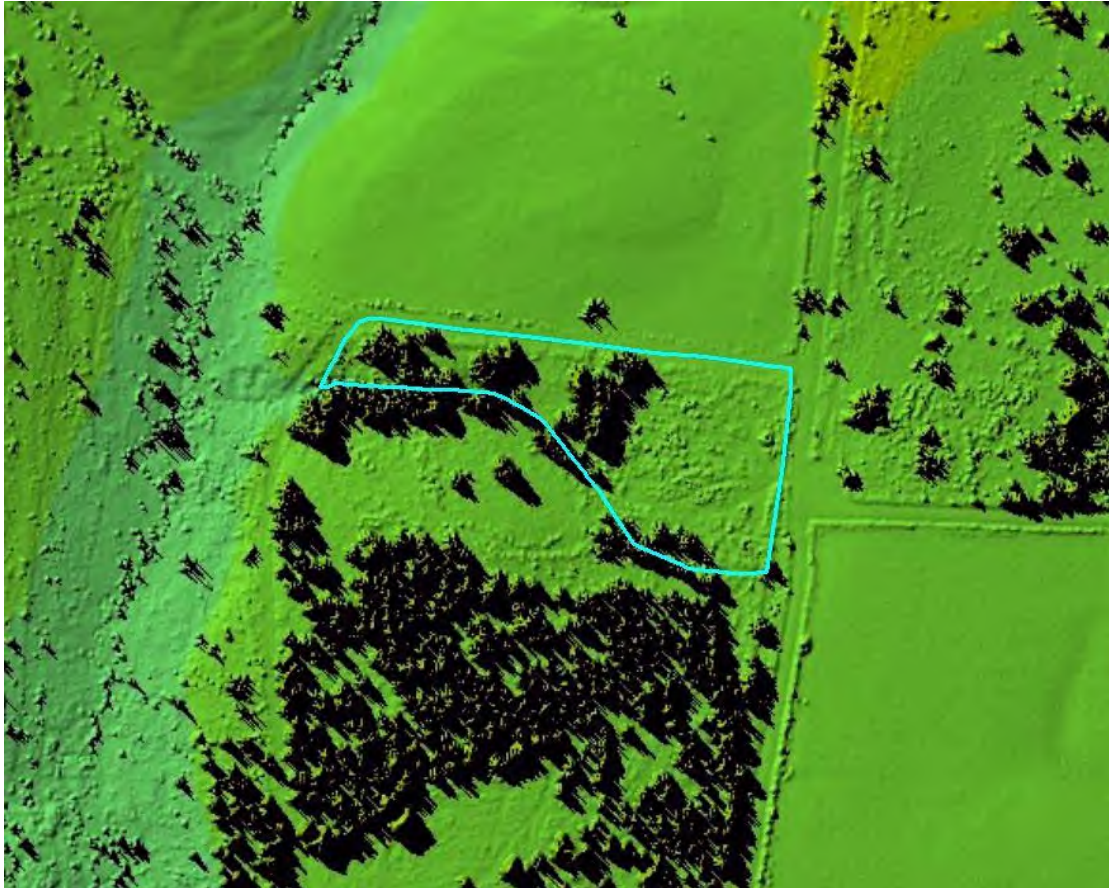
Feature	Comment
Landscape History	Originally part of an unenclosed pasture woodland ecosystem though converted to an Oak plantation after enclosure. This Oak plantation was later harvested (by 1960 –see Appendix 2) leaving unwooded (but not cultivated) ground. Later prepared (by unknown means) and planted with Corsican Pine by c. 1980. Not grazed.
Presence of semi-natural woodland communities	There is a Corsican Pine Plantation over almost all of the plot and there is no Peterken Stand Type present. Norton recorded the NVC type W10 here but this is based on the ground flora and there is no intact old W10 woodland here. A small area of semi-natural woodland occurs in the south eastern corner of the plot (Norton, 2019).
Ground vegetation and ancient woodland vascular plants	The ground vegetation is largely Bracken-Bramble scrub and has 16 AWVP species present.
Extent of Disturbance to soil	Soil will have been disturbed when the pasture woodland was cleared and the oak plantation established. It will have been disturbed again for establishing the Pine plantation. .
Lichens and Veteran Trees	There are no veteran trees in this plot and there is no lichen interest.

- 5.26 This former pasture woodland is now a dense Pine plantation dominated by non-native trees. Being under a pine plantation, the natural woodland of this site barely exists and there is little to no tree/shrub layers to assess its condition.
- 5.27 The ungrazed, unmanaged understory of dense, species-poor Bracken-Bramble community is the modern descendant – though much modified - of the former ancient pasture woodland. It is a dense, species-poor community that dominates the ground layer to the exclusion of other ground vegetation types as well as floristic diversity. This ground vegetation is in unfavourable condition and will not change for the foreseeable future.
- 5.28 Without management, and a plan to restore this plot to broad-leaved woodland (based on species characteristic of this piece of landscape and of native provenance), there will be no semi-natural woodland here and the unfavourable condition of the ground vegetation and flora will be maintained for the foreseeable future.

Bell's Copse Fragment

- 5.29 Bell's Copse fragment is mostly scrub and grassland with a few scattered pines. Its composition is 1.5 ha of a mosaic of Bracken (NVC: U20a), Gorse-Bramble Scrub (NVC: W25b) and Molinia Grassland (NVC: M25b).

Fig 5.5: Bell Copse fragment over LIDAR 1m/2m DSM.



- 5.30 Norton (2019) describes the vegetation of the area (H1) as:

“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).”

- 5.31 There is no lichen interest in this area and there are no veteran trees. There appears to be no survivors from the former Bell's Copse coppice stools/standards.

Table 5.6: Features of the Bell's Copse fragment

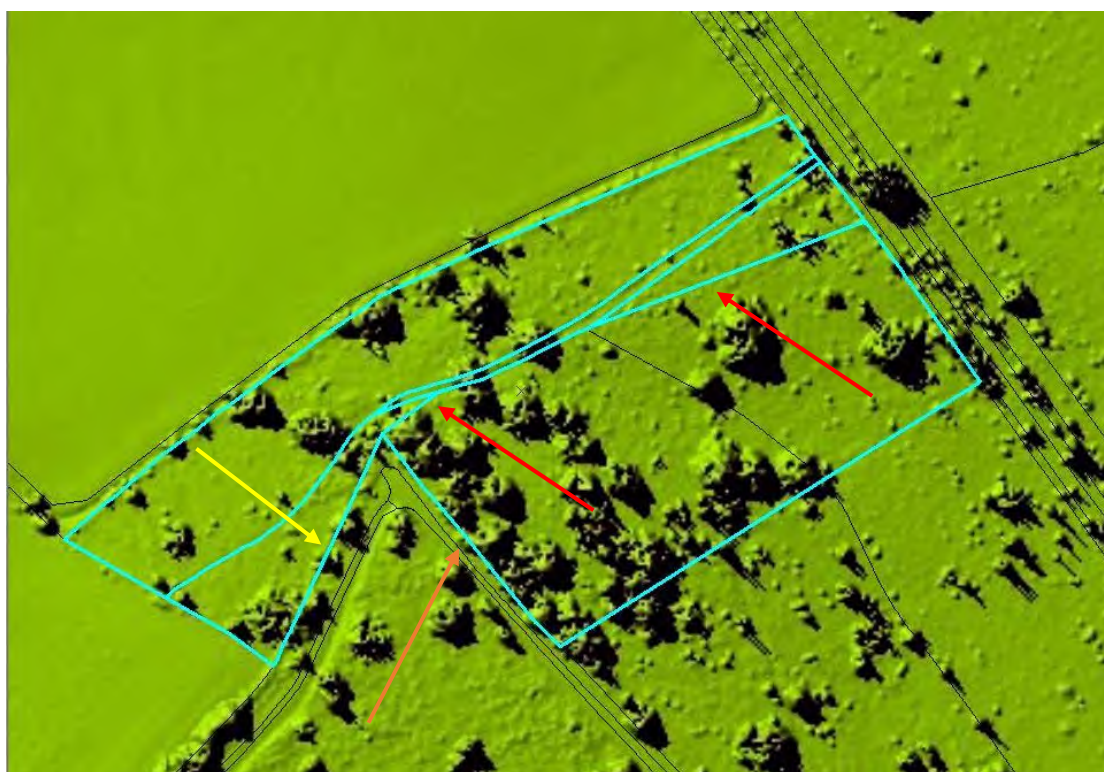
Feature	Comment
Landscape History	The 'fragment' is part of a formerly much larger, anciently enclosed coppice woodland (Bell's Copse). The area of the fragment was grubbed out in the 1970s followed by partial re-stocking with conifers. Now unmanaged and in a scrub/grassland phase but succeeding towards woodland.
Presence of semi-natural woodland communities	There are no recognisable semi-natural NVC woodland or Peterken Stand Types. The scrub and associated woody species indicate that this area is succeeding to a semi-natural woodland and that given that it is natural regeneration, the woodland is of local provenance. Woodland development is currently being checked by localised (and unauthorised) burning in the fragment.
Ground vegetation and ancient woodland vascular plants	The ground vegetation (Bracken, <i>Molinia</i> grassland and heathy scrub) are semi-natural communities. Though Bell's Copse is rich in AWVP species (Sanderson, 1994), there is no list specific to the fragment.
Extent of Disturbance to soil	The soils would have been damaged to an unknown extent during the clearance of Bell's Copse in the 1970s and subsequent planting (e.g. machinery across the area compacting soils, bulldozing out of tree/coppice stumps, potential herbicide use etc.). The flora and vegetation now present indicates that seeds and mycorrhizal elements of the soil survived.
Lichens and veteran trees	There is no lichen interest in this area and there are no veteran trees. There appears to be no ancient coppice stools surviving.

- 5.32 The original ancient woodland (whatever composition it had) in the Bell's Copse fragment was cleared in the 1970s. What is present today are relicts of a subsequent pine plantation surrounded by a mosaic of young trees, bracken, heathy scrub and rank Purple Moor-grass *Molinia* grasslands. Given that there is no ancient tree and shrub community present to assess, the condition assessment here focuses on the regenerating vegetation and ground flora.
- 5.33 The site is going through natural succession and will develop into woodland, this process being checked by burning. At present, however, there is no (or little) management of the ground vegetation and there is occasional unauthorised burning in the plot. This leads to a cycle of rank vegetation followed by scorched or bare ground. The burning is checking the development of the tree and shrub layer as well as altering the ground flora and vegetation though it does prevent, to some extent, the development of dense stands of trees that would shade out ground layer.
- 5.34 The plot is in unfavourable condition for its ground/scrub vegetation and that without management in conjunction with controlling burning will remain in this condition.

The Blendworth Fragment

- 5.35 The Blendworth fragment is a small area of land on the southern side of the historic parish of Blendworth. The area lies at the junction of three historic parishes: Blendworth, Idsworth and Havant. Fig 5.6 below shows the extent of the fragment and the parish boundaries. The large rectangle forming the southeastern polygon is in the historic parish of Idsworth and the rectangular plot to its north is in Blendworth. The red arrows points to the line of the Blendworth-Idsworth parish boundary; the yellow arrow points to the Blendworth-Havant Parish boundary and the orange arrow points to the Idsworth-Havant parish boundary. The Blendworth-Havant and the Idsworth Havant boundaries are marked by a substantial bank and ditch structure that must have been built in c. 1815 when Blendworth and Idsworth were enclosed. This bank has yews and oaks on it.

Fig 5.6: Blendworth fragment over LIDAR 1m/2m DSM. . Most of the larger trees in Idsworth and Blendwoerth are Yews.



- 5.36 Norton describes the woodland in the Blendworth fragment as:

“Woodland area at the northern tip of Havant Thicket woodland. There is a boundary bank and ditch on the west and north-west side and an old track inside the boundary here, which has largely grown over.

The woodland is dominated by oak or birch with occasional ash and an understorey of 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.”

Table 5.7: Features of the Blendworth fragment

Feature	Comment
Landscape History	Formerly a small undefined area that used to be part of the Blendworth Common, possibly the edge of an ancient pasture woodland complex but more likely an open, rough grazing area. This area was enclosed in c. 1814. A substantial parish bank and ditch was dug on its southern edge against Havant parish and this bank now has a couple of mature Oak stubs (the largest being 233cm girth). A large bank has been built that now forms the northern edge of the plot, this also has mature Oak on it. The tithe map records the vegetation of this area as 'Rough' indicating that no woodland was then present, though scattered trees may have been. The area was planted up as a mixed plantation between 1840 and 1870 and has remained wooded since then. Some of the original plantation survives but substantial areas are now recent, young growth (for example <i>Betula</i> Birch stands).
Presence of semi-natural woodland communities	The woodland has semi-natural woodland vegetation referable to NVC woodland types W10a and W10c (Norton, 2019) though these are not ancient. The ground flora is species-poor and not indicative of an ancient woodland vegetation.
Ground vegetation and ancient woodland vascular plants	The total number of AWVP species are not known though four species are listed in the Norton description.
Extent of Disturbance to soil	The last time this area was disturbed to any significant extent would have been when the roughs were converted to woodland in the mid-19th century. It appears that there has been little disturbance since then.

- 5.37 There are no veteran trees in this area and there is no lichen interest. Note however that there is a yew population partially in Blendworth but mostly in Idsworth parish that lies southeast of Blendworth. Some of these yews are on the Idsworth –Havant parish boundary bank and these trees cannot be older than c. 1814. There are old oak stubs on the Blendworth –Havant boundary bank though given that they have been coppiced, these are not veteran trees.
- 5.38 The Blendworth fragment woodland is unmanaged and the structure of the woodland is a high forest. The ground layer is locally dominated by Bracken-Bramble scrub. As woodland, this is, in the absence of any appropriate management, in favourable to unfavourable condition and in the absence of specific management, will remain so for the foreseeable future.

6 Summary

Ancient Woodland Status

Woodland plots in the historic parish of Havant

The Avenue

- 6.1 Part of an ancient pasture woodland complex until c. 1870. Some elements of pasture woodland ecosystem still present including pre-enclosure oaks, old –growth lichen species and a diverse flora with 37 ancient woodland vascular plants still present. **The Avenue is a species-rich, ancient pasture woodland relic with some features of interest inherited from previous pasture woodland ecosystem still present.**

Middle Clearing

- 6.2 The area of Middle Clearing was, until c. 1870, part of an ancient pasture woodland complex on common land. The original woodland was cleared and the Middle Clearing area is shown as unwooded on the 1895 25 inches to the mile OS map. The 1907 OS 25 inch map shows it as a mixed woodland that must have been planted soon after 1895. This mixed woodland was thinned/cleared (or possibly failed) by 1946 (see Appendix 2 for aerial photo) and then planted up as an oak plantation by 1954 – it is this plantation that forms the woodland present today.
- 6.3 Middle Clearing is now a very simplified ecosystem of even aged oaks (planted and almost certainly not of local provenance) over a fertile, species-poor grassland. Nothing remains of the ancient pasture woodland in the tree/shrub layers or the ground vegetation. 16 ancient woodland vascular plant species have been recorded here – many rare and/or with a restricted distribution (on a bank or alongside watercourses) within the Clearing. Their presence here could be as survivors from the pre-enclosure days or have colonised in since 1870 from the various land management activities and plantings. **The woodland present today is certainly not ancient pasture woodland, and little survives to justify an ancient woodland status.**

Round Wood

- 6.4 Round Wood (a modern name) was, historically, part of an ancient pasture woodland complex until c. 1870, when it was enclosed and subsequently cleared and re-planted. This planting cleared probably in the 1930's. What was to become Round Wood was in 1946 (see Appendix 2) part of a large area of young growth Oak (presumably planted) with some scattered older trees present. This larger area was cut back and cleared by 1954 leaving the area that is now Round Wood.
- 6.5 Round Wood is now a very simplified ecosystem of mostly even-aged oaks (planted and almost certainly not of local provenance) though a few larger, older oaks are present. The trees are over a fertile, species-poor grassland. Nothing remains of the ancient pasture woodland in the tree/shrub layers or the ground vegetation. 7 ancient woodland vascular plant species have been recorded here – many rare and/or with a restricted distribution within the plot. The presence of these species here could be as survivors from the pre-enclosure days or have colonised in since 1870 from the various land management activities and plantings. **The woodland present today is certainly not ancient pasture woodland. So little survives of the biological heritage of this plot, it is difficult to describe it as ancient woodland.**

Corsican Pine Plantation

- 6.6 Part of an ancient pasture woodland complex until c. 1870. Cleared soon after 1870 and replanted with oak. This planting was cleared between 1946 (shown as woodland) and 1960 (plot shown as scrub). The 1981 shows that this plot had been planted up with Corsican Pine by then. This plot has probably not been grazed since the area was enclosed (from c.1870).
- 6.7 This plot is a Plantation on an Ancient Pasture Woodland Site (PAWS). 16 ancient woodland vascular plants recorded from here. There is very little surviving from the ancient pasture woodland but the natural regeneration under the Pine is scrub vegetation and flora characteristic of the soils of this area. **The stand can be considered a Plantation on an Ancient Woodland Site (PAWS).**

Woodland plots in the historic parish of Blendworth

The Blendworth fragment

- 6.8 The history of this plot is unclear but based on the resources used for this report, the balance of probability is that the Blendworth fragment is not ancient woodland: the historic maps and tithe maps information indicate it was probably open habitat on Blendworth Common that was planted up after tithe mapping of c.1840 (when recorded as 'rough') and before the 1870 1st edition of the 6 inches to the mile OS map (when it is shown as mixed woodland). Surveys by Norton (2019) record vegetation not really characteristic of ancient woodland.
- 6.9 **The Blendworth fragment is probably not ancient woodland.**

Woodland plots in the historic parish of Bedhampton

Bell's Copse fragment

- 6.10 Whilst there is no woodland present the vegetation here is a mosaic of Bracken, heathy scrub, Purple Moor-grass grassland with natural regeneration taking place. **The Bell's Copse fragment is part of the ancient Bell's Copse and is still ancient woodland albeit in very poor condition and with no old features recorded.**

Woodland lichen flora and its conservation significance

- 6.11 The only significant lichen value present in the six plots is in The Avenue. The following lichen summary of interest is from the 2019 lichen report:

“The Avenue scores nine using the Southern Oceanic Woodland Index (SOWI) for all data from 1994 and 2019, with a score of eight using the 2019 data only. These scores are well below the threshold for SSSI quality in the area, which is an SOWI score of 20. No threatened or Section 41 species were recorded. The Avenue includes at least nine veteran trees with lichen interest, which are most likely to originate as pre-enclosure trees”

- 6.12 The Avenue and its lichen flora is one of only four known sites that have survived from the ancient Forest of Bere and its attached commons and park.

Veteran trees

- 6.13 Veteran trees were recorded only from the Avenue – no veteran trees were seen/recorded in the other five plots. The veteran trees were recorded from the Avenue, mostly in the northern part. Some had lichens of conservation interest, whilst others were too shaded to support significant lichens.

Condition of the woodland plots

- 6.14 The condition of the woodlands in each of the six plots is assessed in comparison is with their historic ancient woodland type

The Avenue

- 6.15 The relict pasture woodland and post-enclosure plantations and regeneration that forms The Avenue woodland is in poor condition through, for example, shading, poor structure and limited management. In the absence of any management, it is certain that the condition will remain unfavourable.

Middle Clearing

- 6.16 There is no ancient woodland (e.g. the tree/shrub layers and ground vegetation) to assess in Middle Clearing. The woodland – a plantation - is in unfavourable condition and with ongoing grazing will remain so for the foreseeable future.

Round Wood

- 6.17 There is no ancient woodland (e.g. the tree/shrub layers and ground vegetation) to assess in Round Wood. The woodland – a plantation - is in unfavourable condition and with ongoing grazing will remain so for the foreseeable future.

Corsican Pine Plantation

- 6.18 The Corsican Pine Plantation is in very poor condition for its native woodland. There is almost no native woodland present under the Pine though there is substantial natural scrub and regeneration happening. Until the Pine plantation is removed and planning/management developed for the restoration of a natural broad-leaved woodland (of local provenance) the condition will remain unfavourable.

The Blendworth fragment

- 6.19 This woodland is not managed and is a mixture of high forest, relict sweet chestnut, young woodland and scrub. The woodland is not managed though is not densely shaded. The condition is favourable to unfavourable and this will be maintained for the foreseeable future unless appropriate management is introduced.

Bell's Cope fragment

- 6.20 The Bell's Cope fragment is in poor condition. It is composed of scrub and grassland communities with natural regeneration occurring though checked periodically by (unauthorised) fires. In the absence of any management plan to protect and manage the natural regeneration here, it is likely that the condition will remain unfavourable for the foreseeable future.

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Appendix 1

Lichen Survey of Proposed Havant Thicket Reservoir Site, 2019

(Report authored by NA Sanderson, 2019)

ADD SANDERSON 2019 REPORT IN HERE

Appendix 2

Aerial Photography

(All aerial photographs in this Appendix sourced from Viney, 2012)

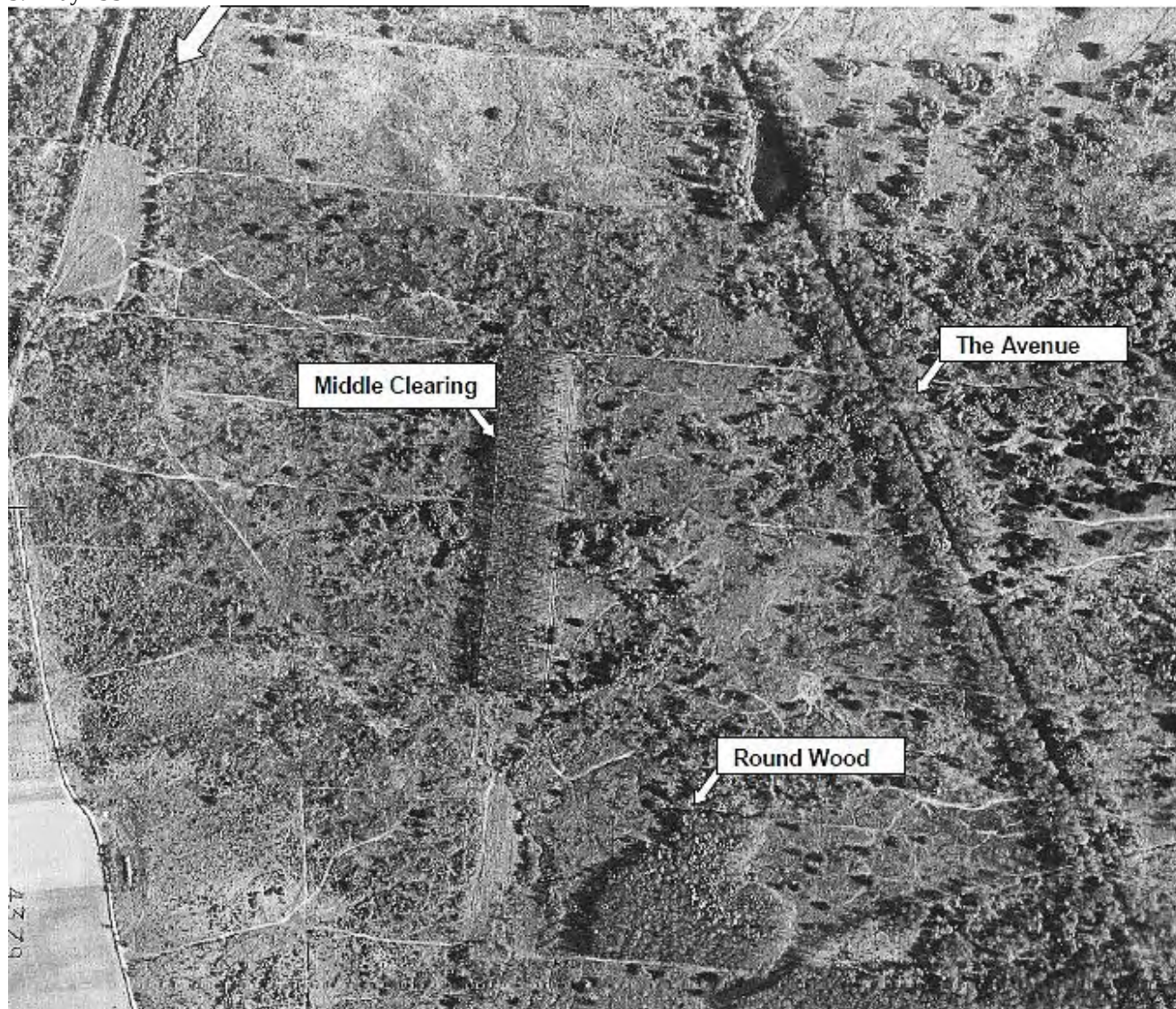
1. Historic Aerial Photograph 19 April 1946 RAF- source NMR from Viney 2012.



2. March 1954



3. May 1954



4. 1960



5. May 1981



Appendix 3

Report: 'Havant Thicket. Proposed Reservoir Site – Nature Conservation Value. For Hampshire Wildlife Trust' (Sanderson, 1994)

**HAVANT THICKET
PROPOSED RESERVOIR SITE
- NATURE CONSERVATION VALUE -**

**A Report by
N A Sanderson
for
Hampshire Wildlife Trust**

December 1994

**Hampshire & Isle of Wight Wildlife Trust
8 Romsey Road
Eastleigh
Hampshire
SO50 9AL
Regd Co No 676313
Regd Charity No 201081**

C I R C U L A T I O N

Portsmouth Water Company

East Hampshire District Council

Havant Borough Council

Hampshire County Council (Countryside and Community Department)

Hampshire County Council (Planning Department)

Sir George Staunton Country Park

Hampshire Wildlife Trust

N A Sanderson

HAVANT THICKET PROPOSED RESERVOIR SITE

1.0 INTRODUCTION

1.1 Background

For many years there have been local plan policies for a reservoir on land owned by the Portsmouth Water Company north of Havant (map 1). This land is also part of the Sir George Staunton Country Park which is managed by Hampshire County Council's Countryside and Community Department. The proposed reservoir site was once part of the pasture woodland and heathland common of Havant Thicket which was enclosed in 1870 (maps 2 and 3). This land was wooded until the 1960's or 70's when much was cleared and put down to improved grassland. Areas of woodland remain.

The following report which reviews the current nature conservation value of the reservoir reservation was commissioned by Hampshire Wildlife Trust and was written by N A Sanderson.

1.2 Brief.

The survey consists of two parts: a review of existing data held by HCC and a field survey to determine if there are any relic lower plant communities surviving from its pasture woodland phase.

2.0 REVIEW OF EXISTING DATA

2.1 Land Use History.

In the early 19th century Havant Thicket was an unenclosed common dominated by pasture woodland but with areas of open heath. It was part of 15km of contiguous similar unenclosed land some of which was owned by the crown as the Forest of Bere (Map 1). Havant Thicket, however, was not part of the Forest and escaped enclosure until the 1810's when the bulk of this land was enclosed. Remarkably Havant Thicket survived largely unenclosed until 1870 and the pre-enclosure vegetation is shown clearly on the OS 1st series 6" map surveyed in the 1860's (map 3). This remarkable map shows a fully functional pasture woodland with heathy plains and extensive woodlands seamed with winding tracks connecting the glades.

Unfortunately at the precise time the New Forest was saved from enclosure Havant Thicket was enclosed and the pasture woodland and heathland grubbed out. This destruction was very thorough, apparently the only trees left were the old Yews which are scattered through the remaining woodlands. These are the only direct living links with the pasture woodland. As the site was entirely replanted with Oak the woodland soils and the ground flora were preserved.

In the twentieth century the northern part of the Havant Thicket was cleared of Oak and replanted with Conifers and Beeches while much of the woodland to the south was grubbed out.

The woodland left over from this clearance and grubbing, the southern relic of Thicket Bottom and a strip along The Avenue, is therefore an ancient woodland site. In fact Havant Thicket is likely to have been primary woodland never cleared since the return of trees after the ice age, so the small area of surviving woodland has a long history.

2.2 Biological Data.

2.2.1 Sources

Major surveys of the country park include:-

- * A (1985) survey by HCC Planning Department's Habitat Assessment Team covering all the parks and woodland and unimproved grassland. A HCC woodland card was completed for Thicket Bottom.
- * An undated invertebrate survey by Matthew Oates of Bells Copse and the FC owned part of Havant Thicket. Thicket Bottom was not covered.
- * A 1992 vegetation survey by Chris Hall of the FC owned part of Havant Thicket. Again Thicket Bottom was not covered.

As well these HCC files contained useful reports by the park warden, Neale R. Hider, including data on butterflies, dragonflies and birds.

2.3 Data

2.3.1 Vegetation Survey

A copy of the original HAT Woodland Survey card is given in Annex 1 but the species lists have been transferred to Table 1. One additional species was found on HCC files, Bitter Vetch (*Lathyrus linifolius*). This was recorded from the south of the Avenue and has been added to Table 1. The HAT card covered the contiguous woodland south of the reservoir reservation as well as the isolated blocks to the west of the Avenue (Annex 1).

The main areas of wood, which would be affected by the reservoir are mapped as Peterken stand type (Peterken, 1981) lowland Hazel-Pedunculate Oak woodland (6Dc) with Lowland Birch-Pedunculate Oak woodland (6Db) near the Upper Lake. The wood in general is described as an Oak plantation with a Hazel understorey. To the south, beyond the reservoir allocation, there is some Ash and recently arrived Hornbeam. The isolated blocks of Oak plantation to the west are open to heavy stock grazing from the neighbouring improved grasslands and lack a significant shrub layer or ground flora.

The total flora recorded is 106 species. Of these 32 are Ancient Woodland Vascular Plants. These include *Carex pendula*, *Anemone nemorosa*, *Euphorbia amygdaloides*, *Lathyrus linifolius*, *Ruscus aculeatus* and *Sanicula europea*. This is a rich ancient woodland flora and is about equal to that of the adjoining anciently enclosed coppice Hammonds Lane Copse but lower than the 39 recorded by HAT from the superbly rich Bells Copse (Annex 2).

As well as the woodland flora two relics from the heathland element of Havant Thicket were recorded. These are a small and not very significant area of heath with Heather *Calluna vulgaris* and Dwarf Gorse *Ulex minor* and

an important marginal flora around the Upper Lake. Here a swampy area round the pond includes two species very rare in south east Hampshire Bog St. John's-wort *Hypericum elodes* and Floating Clubrush *Eleogiton fluitans* together with Bog Pondweed *Potamogeton polygonifolius* which is rare in this area. In the New Forest these species frequently occur together in flushed areas of valley mires and the edges of fluctuating ponds but are rare or absent elsewhere in the county.

2.3.2 Dragonflies

A detailed dragonfly survey was carried out by N Hider in 1992. This recorded two rich dragonfly sites on the park. The Main Lake and the Upper Lake. In total 14 dragonfly species were definitely recorded, all of which were seen by the Main Lake. The following nine species were recorded by the Upper Lake:

<u>Species</u>		<u>Population</u>
<i>Lestes sponsa</i>	Emerald Damselfly	C
<i>Pyrrosoma nymphula</i>	Large Red Damselfly	C
<i>Ischnura elegans</i>	Bluetailed Damselfly	B
<i>Enallagma cyathigerum</i>	Common Blue Damselfly	C
<i>Coenagrion puella</i>	Azure Damselfly	B
<i>Aeshna cyanea</i>	Southern Hawker	Occasionally seen
<i>Anax imperator</i>	Emperor Dragonfly	B
<i>Libellula depressa</i>	Broad-bodied Chaser	B
<i>Sympetrum striolatum</i>	Common Darter	D

Population: B = 2-5 individuals C = 6-20 individuals D = 21-100 individuals.

This is a reasonably rich dragonfly fauna but not outstanding. Additional species found at the Main Lake include Blacktailed Skimmer *Orthetrum cancellatum*, Red-eyed Damselfly *Erythromma najas* a scarce species in South Hampshire and Downy Emerald *Cordulia aenea* a nationally scarce species. The Main Lake therefore is of much greater significance and is probably not short of being of SSSI status.

2.2.3 Butterflies

The warden, N Hider, records a butterfly transect which includes the southernmost section of The Avenue out with the reservoir reservation but includes general comments on species distribution within the park. The most restricted species recorded from The Avenue for 1992 and 1993 was Silverwashed Fritillary *Argynnis paphia*.

2.2.4 Birds

A 1992 report on the birds of the park by N Hider records a typical woodland fauna from Thicket Bottom. The most interesting record was Lesser Spotted Woodpecker. In 1992 one male was seen frequently in summer around the junction of The Avenue, Thicket Bottom and Hammond's Land Copse.

The improved grasslands of Deerslaughter Plain and Gypsy Plain support Sky Lark and Lapwing. Snipe and Lapwing are recorded in winter.

TABLE 1
Thicket Bottom 1985/86
HAT Survey

Species	Freq	AW	NS	Comment
TREES & TALL SHRUBS				
Acer campestre	O	+		
Aesculus hippocastanum	O			
Betula pendula	F			
Betula pubescens	F			
Carpinus betulus	O	+		
Corylus avellana	A			
Crataegus monogyna	O			
Euonymus europaeus	R			
Fagus sylvatica	O			
Frangula alnus	R	+		
Fraxinus excelsior	R			
Ilex aquifolium	A	+		
Ligustrum vulgare	O			
Pinus sylvestris	O			
Populus tremula	O	+		
Prunus avium	R	+		
Prunus laurocerasus	O			
Prunus spinosa	O			
Quercus cerris	O			
Quercus petraea	R	+		
Quercus robur	D			
Rhododendron ponticum	R			
Rosa arvensis	F	+		
Rosa canina	F			
Salix caprea	O			
Salix cinerea oleifolia	O			
Sambucus nigra	O			
Taxus baccata	F			
Viburnum opulus	O	+		
CLIMBERS				
Hedera helix	A			
Lonicera periclymenum	A			
DWARF SHRUBS				
Calluna vulgaris	O			In heath remnant at top end of Avenue
Ulex minor	R			In heath remnant at top end of Avenue
GRASSES				
Agrostis canina	O			In upper lake
Agrostis capillaris	O			
Brachypodium sylvaticum	O			
Dactylis glomerata	O			
Deschampsia cespitosa	F			
Festuca rubra	R			
Holcus lanatus	O			
Holcus mollis	O	+		
Molinia caerulea	O			

Freq = Frequency, AWVP = Ancient Woodland Vascular Plant, NS = Nationally scarce species,
D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

TABLE 1
Thicket Bottom 1985/86
HAT Survey

Species	Freq	AW	NS	Comment
<i>Poa trivialis</i>	O			
OTHER VASC. PLANTS				
<i>Ajuga reptans</i>	O			
<i>Anemonemorosa</i>	O	+		
<i>Angelica sylvestris</i>	R			
<i>Arummaculatum</i>	O			
<i>Callitriche stagnalis</i>	O			
<i>Cardamine flexuosa</i>	F			
<i>Cardamine pratensis</i>	R			
<i>Carex pendula</i>	R	+		
<i>Carex remota</i>	R	+		
<i>Carex sylvicata</i>	O	+		
<i>Conopodium majus</i>	O	+		
<i>Digitalis purpurea</i>	O			
<i>Dryopteris affinis</i>	O	+		
<i>Dryopteris dilatata</i>	O			
<i>Dryopteris filix-mas</i>	O			
<i>Eleogiton fluitans</i>	O			Abundant in upper lake, very rare in SE Hampshire
<i>Euphorbia amygdaloides</i>	O	+		
<i>Filipendula ulmaria</i>	O			
<i>Fragaria vesca</i>	O			
<i>Galium aparine</i>	F			
<i>Galium palustre</i>	O			
<i>Geranium robertianum</i>	R			
<i>Glechoma hederacea</i>	O			
<i>Hedera helix</i>	A			
<i>Hieracium</i> sp.	O			
<i>Hyacinthoides non-scripta</i>	O	+		
<i>Hypericum elodes</i>	O			Abundant in upper lake, very rare in SE Hampshire
<i>Juncus effusus</i>	O			
<i>Lamium galeobdolon</i>	O	+		
<i>Lathyrus linifolius</i>	R?	+		Recorded at the south end of the Avenue, GSCP files
<i>Lonicera periclymenum</i>	A			
<i>Luzula forsteri</i>	O	+		
<i>Luzula pilosa</i>	O	+		
<i>Lysimachianemorum</i>	O	+		
<i>Mentha aquatica</i>	R			
<i>Moehringia trinervia</i>	R	+		
<i>Oxalis acetosella</i>	F	+		
<i>Plantago lanceolata</i>	O			
<i>Plantago major</i>	O			
<i>Polystichum setiferum</i>	R	+		
<i>Potamogeton polygonifolius</i>	O			Abundant in upper lake, rare in SE Hampshire
<i>Potentilla erecta</i>	O			In heath remnant at top end of Avenue
<i>Potentilla sterilis</i>	O	+		
<i>Primula vulgaris</i>	O	+		
<i>Pteridium aquilinum</i>	F			
<i>Ranunculus ficaria</i>	F			

Freq = Frequency, AWVP = Ancient Woodland Vascular Plant, NS = Nationally scarce species,
D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

TABLE 1
Thicket Bottom 1985/86
HAT Survey

Species	Freq	AW	NS	Comment
<i>Ranunculus repens</i>	F			
<i>Rubus fruticosus</i>	O			
<i>Rumex obtusifolius</i>	R			
<i>Rumex sanguineus</i>	R			
<i>Ruscus aculeatus</i>	F	+		
<i>Sanicula europaea</i>	O	+		
<i>Scrophularia nodosa</i>	R			
<i>Solidago virgaurea</i>	R	+		
<i>Sparganium erectum</i>	O			In upper lake
<i>Stellaria holostea</i>	F			
<i>Stellaria media</i>	R			
<i>Succisa pratensis</i>	R			
<i>Taraxacum</i> sp.	F			
<i>Teucrium scorodonia</i>	F			
<i>Typha latifolia</i>	O			In upper lake
<i>Urtica dioica</i>	F			
<i>Veronica chamaedrys</i>	O			
<i>Veronica montana</i>	O	+		
<i>Viola riviniana</i>	O			

Species total 106

Total AWVP 32

Total nationally scarce spp 0

Freq = Frequency, AWVP = Ancient Woodland Vascular Plant, NS = Nationally scarce species ,
D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

3.0 LOWER PLANT SURVEY

3.1 Methods

The woodland to be affected by the reservoir proposal was walked in December 1994 and the epiphytic lower plant flora recorded (table 2). The rest of Thicket Bottom was also looked at. The bryophyte ground flora was looked at but not recorded as it appeared very ordinary. Also notes were taken on the general flora of the Upper Lake and the two areas of the replanted part of Havant Thicket affected.

3.2 Epiphytes

A total of 25 lichen species, two mosses and two Liverworts were recorded from The Avenue and Thicket Bottom. The lichen flora in Thicket Bottom is somewhat depressed by the shade of the full canopy while that of The Avenue is more affected by air pollution due to its lack of shelter. The current flora is clearly recovering from past pollution as some pollution-sensitive species were seen. One small, stunted *Parmelia reticulata* thallus had the appearance of a recolonizing plant rather than a relic species.

In terms of ancient woodland species four species on Dr Rose's ancient woodland indicator list (New Index of Ecological Continuity - NIEC) [Rose 1992] were recorded. Two species *Schismatoma niveum* and *Arthopyrenia ranunculospora* were recorded only from the area to be flooded while the other two, *Athonia vinosa* and *Phaeographis inusta* was found on one old Hazel bush, the others on mature Oaks. Their distribution is shown on map 4.

This is not a high total and the species involved are ones which can slowly be recolonized woodlands after severe disturbance unlike more sensitive lichens which cannot be recolonized at all as far as is known. A total of 4 NIEC species is fairly typical of derelict coppices on ancient sites in South Hampshire.

3.3 Notes on the General Flora

3.3.1 The Upper Lake

The Upper Lake still has strong populations of the locally rare *Potamogeton polygonifolius* and the locally very rare *Hypericum elodes* and *Eleogiton fluitans* (map 4). They form a fringe around the margin and the latter two are also abundant in a swamp at the head of the lake in a low sward with *Agrostis canina*, *Sphagnum auriculatum* and *Hydrocotyle vulgaris*. Within this sward are tussocks of *Juncus effusus*, *Sparganium erectus* and patches of colonizing Birch. The *Hydrocotyle* is a new site record.

At the time of survey this community was flooded. The marginal community is probably dependent on strongly fluctuating water levels. In summer the small catchment probably leads to low water levels in the pond while the local clay soils result in rapid run-off and flooding in winter.

The community belongs to NVC community *Hypericum elodes* - *potamogeton polygonifolius* soakway (M29) a south-western community near its eastern limit here. It is exceptionally rare outside of the New Forest in South Hampshire.

TABLE 2
Thicket Bottom 1994
Epiphytic Lichens & Mosses

Species	NI	BS	NR	Comment
Lichens				
Arthonia spadicea				Rare on oak
Arthonia vinosa	+			Occasional on oak Thicket Bottom only
Arthopyrenia ranunculospora	+			Rare on oak, not seen to the south
Chrysothrix candelaris				Occasional on oak
Chrysothrix chrysophthalma				Occasional on oak
Cladonia coniocraea				Occasional on oak
Enterographa crassa				Rare on oak
Evernia prunastri				Rare on oak
Graphis scripta				Occasional on old hazel, Thicket Bottom only
Lecanactis abietina				Frequent oak, Thicket Bottom only
Lecanora expallens				Frequent on oak
Lepraria incana				Frequent on oak
Parmelia caperata				Frequent on oak but small thalli
Parmelia perlata				Rare on oak, Thicket Bottom only
Parmelia reticulata				Rare on oak, small stunted thallus
Parmelia revoluta				Rare on oak
Parmelia saxatilis				Rare on oak
Pertusaria amara				Occasional on oak
Pertusaria hemisphaerica				Occasional on oak
Pertusaria hymenea				Frequent on oak
Pertusaria pertusa				Occasional on oak
Phaeographis inusta	+			Rare on old hazel, Thicket Bottom only
Phlyctis argena				Frequent on oak
Schismatomma niveum	+			Occasional on oak, not seen to the south
Usnea cornuta				Occasional on oak
MOSSES				
Hypnum mammaillatum				Abundant on oak
Isothecium myosuroides				Occasional on oak, Thicket Bottom only
LIVERWORTS				
Lejeunea ulicina				Rare on old hazel, Thicket Bottom only
Metzgeria temperata				Rare on old hazel, Thicket Bottom only

Species 29

NIEC spp 4

Bonusspp 0

Nationally rare spp 0

NI=NIEC species, BS=Bonus species, NR=National rare species

3.3.2 Havant Thicket Eastern Valley

This is mostly Corsican Pine plantation but there is some *Ulex minor* at the edge of the plantation and *Sphagnum auriculatum* by the stream with a little *Dryopteris carthusiana*.

3.3.3 Havant Thicket Western Valley

South of the forestry track the potentially flooded area is a spruce plantation with a little *Dryopteris carthusiana*. North of the road is an extensive clear fell with much bracken and locally some heathland species including *Calluna vulgaris*, *Danthonia decumbens*, *Molinia caerulea* and *Sphagnum auriculatum*.

4.0 **SUMMARY OF INTEREST**

The Avenue is part of a species rich ancient woodland which is a relic of the extensive pasture woodlands of Havant Thicket. Oak was planted after enclosure in 1870 but the wood is basically still semi-natural. A rich ground flora occurs as this was much less disturbed by enclosure but only a relatively poor epiphytic flora survives. This, however, does include a few ancient woodland species with some recolonizing ability.

The Upper Lake has a reasonable dragonfly fauna and an important marginal flora which is easily the single most important floristic feature in the country park.

The valleys which will be flooded within the plantations to the north could be restored to heathland but represent a limited proportion of the area of potential heathland here.

The patches of Oak plantation to the east of The Avenue are of no interest and the improved grasslands also seem of little interest.

5.0 **RESPONSE TO THE RESERVOIR PROPOSAL**

The loss of the Upper Lake would represent a serious loss to the biodiversity of this part of Hampshire. Replacement habitat produced by damming one or more of the feeder streams to the north within the FC land is probably feasible. This would produce similar ponds to the existing one and material could be transplanted. This would be of higher quality if they could be in the context of a restored grazed heathland and pasture woodland habitat.

Further work on the invertebrates of Upper Lake is required. It is possible that there are some rare or scarce Diptera or other invertebrates associated with the marginal vegetation. Without this work the degree to which compensation measures can be fully carried out cannot be assessed.

The loss of the ancient woodland cannot be compensated for but further work is required to ascertain the impact of the reservoir. For the epiphytic lichens half the four lichen species of interest would be lost but the same calculation cannot be made for the vascular plants on the current data.

6.0 REFERENCES

Peterken, G F (1981) Woodland Conservation and Management, Chapman and Hall.

Rodwell, J S (1991) British Plant Communities Volume 2 Mire and Heaths Cambridge University Press.

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ANNEX 1

HAT WOODLAND SURVEY CARD

ANCIENT WOODLANDS SURVEY - SOUTH REGION

TREES/SHRUBS		Tx	Tp	Ts	Tc	Tn	Cx	Ct	Px	Pc	Sx	Sc	St	Js	Jp	Jv
Acer cam	✓	ACECA				O										
Acer pse		ACEPS														
Alnus glu		ALNGL														
Betul pend	✓	BETPE	F				F						F			
Betul pub	✓	BETPU	F										F			
Bux semp		BUXSE														
Carp bet	✓	CRPBE				O	O									
Casta sat		CSTSA														
Clem vit		CLEVI														
Conifer																
Coryl ave	✓	CRYAV					A								O	
Crata mon	✓	CTGMO				O								O		
Crata oxy		CTGOX														
Euony eur	✓	EUOEU									R					
Fagus syl	✓	FAGSY				O							O			
Frang aln	✓	FRNAL									R					
Fraxi exc	✓	FRXEX	F												F	
Heder hel	✓	HEDHE										A				
Ilex aqu	✓	ILXAQ									A			A		
Junip com		JNPCC														
Ligust vul	✓	LGSVU									O			O		
Lonic per	✓	LONPE										A				
Malus syl		MALSY														
Pinus syl		PINSY														
Popul tre	✓	POPTR	O													
Pru avium	✓	PRUAV					R									
Prunus spi	✓	PRUSP														O
Prunu lau	✓	PRULA										O				
Pyrus com		PYSCO														
Querc cer	✓	QUECE	O													
Querc pet	✓	QUEPE	R													
Querc rob	✓	QUERO	D				O									
Rhamn cat		RHMCA														
Rhodo pon		RHOPO														
Ribes nig		RIBNI														
Ribes syl		RIBSY														
Ribes uva		RIBUV														
Rosa arv	✓	ROSAR									F					
Rosa can	✓	ROSCA									F					
Salix alb		SLXAL														
Salix cap	✓	SLXCA									O					
Salix cin	✓	SLXCI									O					
Salix fra		SLXFR														
Salix pur		SLXPU														
Salix vim		SLXVI														
Sambu nig	✓	SAMNI									O					
Soro scop		SARSC														
Sorb aria		SORAR														
Sorb aucu		SORAU														
Sorb torm		SORTO														
Taxus bac	✓	TAXBA					F								A	
Thely san		TLYSA														
Tilia cor		TILCO														
Tilia vul		TILVU														
Ulex euro		ULXEU														
Ulmus car		ULMCA														
Ulmus gla		ULMGL														
Ulmus pro		ULMPR														
Vibur lan		VIBLA														
Vibur opu	✓	VIBOP												O		

SITE THICKET BOTTOM.		NO. W 719 09
DISTRICT/PARISH Rowland Castle. / Havant		Ha 37 Ha
Grid Ref. 1 712098	OS Sheet 197	County HANTS
Grid Ref. 2 715101	Date 10/12/85.	Recorder HAT.
Grid Ref. 3 721093		
Grid Ref. 4 713093		
OWNER/Tenant/Agent		
Permission to enter from		
Access		
Nature Cons. Status	Open Rides	Pond
Planted Aliens/ Exotics ☒	Public Paths ☒	Overgrown Rides ☒
Old trees	Game	River/Stream ☒
Semi-natural Ancient	Recent	Plantation (C, H, Mx) Ancient Recent
Other records/old maps etc. ON 1910.		
Stand types 3Aa, 6Db, 6Dc.		
SITUATION		SOIL/GEOLOGY London Clay. Soil Survey - Witham 3 Wickham 4 Typical stagnogley s.s. 6.
Valley side ☒ Valley bottom ☒ Plain ☐ Plateau ☐	Hill slope ☐ Hill top ☐ Coastal ☐ Inland ☒	Sand ☐ Silt ☐ Clay ☒ Acid ☐ Neut. ☐ Basic ☐ Podsol ☐ Brown soil ☐ Rend. ☐ Ranker ☐ Alluv. ☐ Gley ☐
Aspect —		Stones ☐ Rock ☐ Peat ☐ Mull ☐ Moder ☐ Mor ☐ Water-logged ☐ Poorly drain. ☐ Freely drain ☐
Slope level - gentle		
Altitude 20 - 30m.		

Tp = Planted tree
 Tn = Self grown tree
 Ts = standard in c-w-s
 Tc = grown from coppice
 Tx = any other tree
 Cx = coppice
 Ct = regrowth from stump
 Px = pollard (2.5m -
 Pc = pollard (1-2.5m)
 Sx = shrub
 Sc = climber
 St = young tree
 Js = seedling
 Jp = sapling
 Jv = sucker

ANCIENT WOODLANDS SURVEY - SOUTH REGION

SITE THICKET BOTTOM.	No.	Grid Ref. 719093	O.S. Sheet 197.	County HANTS
District/Parish	Ha. 37Ha.	Recorder/s HAT.	Date/s 10/12/55.	

SOUTH REGION

ANCIENT WOODLAND VASCULAR PLANTS - The 100 species which in NCC's South Region are most strongly associated with ancient woodland and are typical components of botanically rich ancient woodland communities. The 36 thought to be most indicative of long continuity are marked ●

A B			A B			A B		
<u>Acer campestre*</u>	ACECA	✓	● <u>Euphorbia amygdaloides</u>	EUPAM	✓	P. nemoralis	POANE	
● <u>Adoxa moschatellina</u>	ADXMO		<u>Festuca gigantea</u>	FESGI		● <u>Polygonatum multifl.</u>	PGNMU	
<u>Agropyron caninum</u>	AGRCA		● <u>Frangula alnus</u>	FRNAL	✓	<u>Polypodium vulg.</u>	PLPVU	
● <u>Allium ursinum</u>	ALUUR		● <u>Galium odoratum</u>	GLMOD		<u>Polystichum acul.</u>	PLSAC	
● <u>Anemone nemorosa</u>	ANENE	0	<u>Geum rivale</u>	GEURI		● <u>Polystichum setif.</u>	PLSSE	R
<u>Aquilegia vulgaris*</u>	AQUVU		● <u>Helleborus viridis</u>	HELVI		● <u>Populus tremula</u>	POPTR	0
● <u>Blechnum spicant</u>	BLESP		<u>Holcus mollis</u>	HOLMO	0	<u>Potentilla sterilis</u>	PTLST	0
<u>Bromus ramosus</u>	BRORM		● <u>Hordelymus europaeus</u>	HOREU		<u>Primula vulgaris*</u>	PRIVU	0
<u>Calamagrostis epigejos</u>	CALEP		<u>Hyacinthoides non-scr.</u>	HYANO	0	<u>Prunus avium</u>	PRUAV	✓
<u>Campanula trachelium</u>	CMPTR		● <u>Hypericum androsaem</u>	HYPAN		<u>Pulmonaria longifolia</u>	PLMLO	
<u>Cardamine amara</u>	CARAM		<u>Hypericum pulchrum</u>	HYPPU		● <u>Quercus petraea*</u>	QUEPE	✓
● <u>Carex laevigata</u>	CRXLV		<u>Ilex aquifolium</u>	ILXAQ	✓	● <u>Ranunculus aurico.</u>	RANAU	
<u>Carex pallescens</u>	CRXPA		<u>Iris foetidissima</u>	IRSFO		<u>Ribes nigrum*</u>	RIBNI	
● <u>Carex pendula*</u>	CRXPD		<u>Lamium galeob.</u>	LAMGA	0	<u>Ribes sylvestre*</u>	RIBSY	
<u>Carex remota</u>	CRXRM	R	● <u>Lathraea squamaria</u>	LATSQ		<u>Rosa arvensis</u>	ROSAR	✓
● <u>Carex strigosa</u>	CRXSG		<u>Lathyrus montanus</u>	LTHMO		<u>Ruscus aculeatus</u>	RUSAC	0
<u>Carpinus betulus*</u>	CRPSY	0	<u>Lathyrus sylvestris</u>	LTHSY	✓	● <u>Sanicula europaea</u>	SNCEU	0
<u>Cephalanthera longif.</u>	CRPBE	✓	● <u>Luzula forsteri</u>	LUZFO	0	<u>Scirpus sylvaticus</u>	SCPSY	
<u>Chrysosplenium opposit.</u>	CEPLO		<u>Luzula pilosa</u>	LUZPI	0	<u>Sedum telephium</u>	SEDTE	
<u>Colchicum autumnale</u>	CPLDP		● <u>Luzula sylvatica</u>	LUZSY		<u>Serratula tinctoria</u>	SERTI	
<u>Conopodium majus</u>	COLAU		<u>Lysimachia nemorum</u>	LSINE	0	<u>Solidago virgaurea</u>	SLOVI	R
● <u>Convallaria majalis*</u>	CNPMA	0	<u>Malus sylvestris*</u>	MALSY		● <u>Sorbus torminalis</u>	SORTO	
<u>Corydalis claviculata</u>	CNVMA		● <u>Melampyrum pratense</u>	MELPR		<u>Stachys officinalis</u>	STAOF	
<u>Crataegus laevigata</u>	CYDCL		<u>Melica uniflora</u>	MLCUN		<u>Tamus communis</u>	TMSCO	
● <u>Daphne laureola</u>	CRALA		● <u>Milium effusum</u>	MILEF	R	● <u>Thelypteris oreopteris</u>	THEOR	
<u>Dipsacus pilosus</u>	DAPLA		<u>Moehringia trinervia</u>	MOETR		<u>Tilia cordata*</u>	TILCO	
● <u>Dryopteris carthusiana</u>	DPSPD		<u>Narcissus pseudo.</u>	NARPS		● <u>Ulmus glabra</u>	ULMGL	
● <u>Dryopteris pseudomas.</u>	DRYCA		<u>Neottia nidus-avis</u>	NTTNI		● <u>Vaccinium myrtillus</u>	VCNMY	
<u>Epipactis helleborine</u>	DRYPS	0	<u>Orchis mascula</u>	ORCMA		● <u>Veronica montana</u>	VRNMO	0
<u>Epipactis leptochila</u>	EPPHE		● <u>Oxalis acetosella</u>	OXAAC	F	<u>Viburnum opulus*</u>	VIBOP	0
● <u>Epipactis purpurata</u>	EPPLE		● <u>Paris quadrifolia</u>	PRSQU		<u>Vicia sepium</u>	VICSE	
<u>Equisetum sylvaticum</u>	EPPPU		<u>Phyllitis scolopend.</u>	PHYSC		<u>Vicia sylvatica</u>	VICSY	
	EQUSY		● <u>Platanthera chlor.</u>	PLTCH		<u>Viola palustris</u>	VIOPA	
						● <u>Viola reichenb.</u>	VIORE	

Column A: current records

Column B: old records

*Only tick these species if they occur well within the wood and do not appear to have been planted.

No. of A.W.V.P.

32

Additional species of interest

* Hornbeam clearly a recent arrival.

COUNTY HANTS.

SITE		GRID REF.		DATE	
THICKET BOTTOM.		SU 719093		10/12/85	
RECORDER		HAT.		Ha 37Ha.	
HABITATS IN OR * CLOSE TO WOOD					
* P=Present N=Not seen S=Significant feature					
RIDGES, GLADES, OPEN AREAS vegetation - size - shade - permanence - edges					
(particularly S the upper area of bracken heather and oak to west of pond)					
POND, STREAMS RIVERS vegetation - size - substrate - type of bank - shade - permanence - speed of flow					
Pond in North. Streams present.					
ROCKS Size - abundance - outcrop - scree - cliff - gorges - surface stone - acid basic					
N					
BOG, FEN, FLUSHES vegetation - size - wetness - acid - basic - organic - inorganic					
P					
DEAD WOOD size - felled or fallen - abundance - decay - logs - branches - standing trees - holes or hollows					
P					
OTHER HABITATS OR COMMUNITIES including adjacent land - transitions - nearest woodland					
To west and East of the Avenue - pasture					
WOODLAND SPECIES No. 93					
D=dominant A=abundant F=frequent O=occasional R=rare					
TOTAL SPECIES NO. 105					

Acer camp		Cirs vulg		Hyc non		Poa annua		Sedum for	
1Acer plat	O	1Clem vita		1Hym tunbr	O	1Poa p m m		1Sedum tel	
3Acon ang		1Con macul		1Hyper and		1Poa p m m		1Sanec syl	
1Actaea sp		1Conop maj	O	1Hyper hir		1Polyg mul		12Sibth eur	
1Adoxa mos		1Conva maj		1Hyper hum		1Polyg odo		1Solan dul	
1Aegop pod	R	1Coral tri		1Hyper mac		1Poly dume		1Solid vir	R
1Aesc hipo		1Coryd cla	A	1Hyper mon		1Polydume		1Sorb aria	
1Agrop can		1Coryl ave		1Hyper per		1Polyv vul		1Sorb aucu	
1Agros can		1Crat mono	O	1Hyper pul		1Polys acu		1Sorb devo	
1Agros gig		1Crat oxya		1Hyper tet		1Polys ser	R	1Sorb porr	
1Agros sto	O	1Crep palu		1Ilex aqui	A	1Pop canes		13Sorb rupi	
1Agros ten		1Cyst frag		1Impat nol		1Pop nigra		1Sorb torm	
1Aluga rep	O	1Dact fuch		1Impat par		1Pop tremu	O	1Stach pal	
1Alch glab		1Dact glom	O	1Inul cony		1Pot anser		1Stach syl	
1Alch vest		1Daph laur		1Iris foet		1Pot erect	O	1Stel als	
1Alch xant		1Daph meze		1Iris pseu		1Pot rept		1Stel gram	F
1Allia pet		1Dent bulb	F	1Junc acut		1Pot steri	O	1Stel holo	
1All ursin		1Desch cae		1Junc cong		1Prim elat		1Stel med	R
1Alnus glu		1Desch fla		1Junc effu	O	1Prim veri		1Stel nemo	
1Anem nem	O	1Dipit pur	O	1Junip com		1Prim vulg	O	1Succ prat	R
1Angel syl	R	1Dips pilo		1Lam album		1Pru vulg	O	1Tamus com	
1Anthox od		1Dryop aem		1Laps comm		1Pru vium	O	1Tarax off	F
1Anthr syl		1Dry aust	O	1Lath squ		1Pru lauro	O	1Taxus bac	
1Aquil vul		1Dry car		1Lath mont		1Pru padus	O	1Teuc scor	O
1Arct lapp		1Dry f mas	O	1Lath sylv		1Pru spino	O	1Thali min	
1Arct min		1Dry n mas	O	1Liqua vul	O	1Pru aquil	O	1Thely the	
1Arrh elat		1Epil aden		1Lili mart		1Pyrol med		1Tilia cor	
1Arum ital	O	1Epil hirs		1Linn bore		1Pyrol rot		1Tilia eur	
1Arum mac		1Epil mont		1List cord		1Pyrus com		1Tilia pla	
1Asarum eu		1Epil obsc		1List ovat				1Troll eur	
1Aspl adia		1Epil rose		1Lonic per	A			1Ulex euro	
1Aspl scol		1Epil tetr		1Luz forst	O	1Querc cer	O	1Ulmus car	
1Aspl tric		1Epip atro		1Luz luzul		1Querc rob	O	1Ulmus gla	
1Aspl viri		1Epip lep		1Luz multi	O	1Ran auric		1Ulmus pro	
1Athy f-f		1Epip phyl		1Luz pilos		1Ran ficar	F	1Urtic dio	F
1Atropa be		1Epip purp		1Luz silva		1Ran flamm	F	1Vacc myrt	
1Beton off	F	1Equis hye		1Lych flos		1Ran repen	R	1Vacc viti	
1Bet pendu		1Equis pal		1Lycop eur	O	1Rham cath		1Valer dip	
1Bet rubes	F	1Equis syl		1Lys nemor		1Rhod pont		1Valer off	
1Blech spi	O	1Equis tel		1Lys vulga		1Ribes alp		1Veron cha	O
1Brach syl		1Eranth hy		1Lyth sali		1Ribes nig		1Veron hed	O
1Bryon dio		1Euon euro	R	1Malus syl		1Ribes spi		1Veron mon	O
1Buxus sem		1Eupat can	O	12Mecan cam		1Rosa arve	F	1Veron off	
1Calam can		1Euph amyg		1Melam cri		1Rosa cani		1Vib lanta	O
1Calluna v	O	1Euph lath		1Melam pra		1Rosa duma		1Vib opulu	
1Calth pal		1Fagus syl	O	1Ment ar		1Rosa micr		1Vicia byt	O
1Calyst se		1Festul alt		1Menth arv		1Rosa obtu		1Vicia oro	
1Camp lat		1Festul gig		1Merc pere		1Rosa rubi		1Vicia sep	
1Camp patu		1Festul ovin	R	1Mil effus		1Rosa sher		1Vicia syl	
1Camp rot		1Fest rubr		1Moehr tri	R	1Rosa styl		1Vicia min	
1Card acan		1Filip ulm	O	1Molin cae	O	1Rosa tome		1Viola ar	
1Card amar		1Frag yase	O	1Mones uni		1Rosa vill		1Viola hir	
1Card flex	F	1Frag exca	R	1Mont sibi		1Rubia per		1Viola odo	
1Card impa	R	1Frag aln		1Myos sylv		1Ruba caes	O	1Viola pal	
1Card prat		1Gagea lut		1Myos aquat		1Ruba frut		1Viola rei	
1Car acuti		1Gal odora	O	1Narc pseu		1Ruba idea		1Viola riv	O
1Car biner		1Gal palus		1Neot nidu		1Rum acosa	R	1Wahl hede	
1Car capit		1Gal saxat		1Ophr apif		1Rum acilla		1Zerna ben	
1Car diand		1Geran luc	R	1Ophr inse		1Rum congl	R	1Zerna ram	
1Car digit		1Geran rob		1Ophr masc		1Rum obtus		1Lonic sp	
1Car elong		1Geran san		1Oreop lim		1Rum sangu		1Ulex minor	(R)
1Car hirta		1Geran syl		1Orch purp		1Rusc acul	F	1Plantago lanceol	(C)
1Car laevi		1Geum riva		1Orni pyre		1Salix alb		1Calceche strogalis	
1Car mont		1Glech hed	O	1Ortha secu		1Salix aur	O	1Polytrichum sp	(F)
1Car palie		1Gnaph syl		1Osmun reg		1Salix cin		1In pond	
1Car panic	R	1Goody rep		1Oxal acet	F	1Salix fra		1Hyper. elata	O
1Car pendu		1Gymn dryo		1Panic eur		1Salix pen		1Agros can	O
1Car pseud	R	1Hedera he	A	1Panic hyb		1Salix pur		1Botanaghtan polyg	O
1Car remot		1Heli foet		1Pis qu		1Salix tri		1Sporogonium	O
1Car ripar		1Heli viri		1Pleg con		1Sarc scop		1Sporogonium erectum	
1Car strig	O	1Hierac sph	O	1Pimo majo		1Scirp syl		1Typha lat	O
1Car sylva		1Hierac sp		1Pinus syl		1Scro aqua		1Plantago maj	(R)
1Carpi bet		1Holic lano	O	1Plat bifo		1Scro nogo		1Chama Cyprus	(R)
1Cast sati		1Holic moli	O	1Plat chlo		1Scro umbr	R		
1Ceph dama		1Holic euro							
1Ceph long		1Humul lup							
1Cham ang									
1Chrys alt									
1Chrys opp									
1Circ aloi									
1Circ inte									
1Circ lute									
1Cirs hete									
1Cirs palu									

1 Introductions to G.B.
 3 only in 80-100, 10km squares
 2 only in 30-60, 10km squares
 1 only in 10-30, 10km squares

Stand-type Details

- 3Aa Acid Ash-Hazel-Pedunculate Oak, heavy soil.
 6Db Lowland Birch-Pedunculate oak.
 6Dc Lowland Hazel-Pedunculate Oak.

General Description of Woodland

Map

Originally ^{until after 1870} possible old wood pasture. Appears to be oak plantation with hazel understorey, with odd Holly and row. 4-f dominated by Bramble and Fraxinus.

Most interesting section floristically in the Avenue. Fragment of a heath remnant at top end with Heather, Dwarf Gorse, Tormentil etc. Pond in North with *Hypericum elodes*, *Agrostis canina*, *Potamogeton pectinatus*, *Sparganium erectum* and *Typha latifolia*.

Woods to east of main body are ^{grazed oak} plantations with little plant life below main canopy. Almost total absence of ground flora.

* Possibly only remaining locality in east of ~~Bere~~ Hampshire for *Hypericum elodes* & *Eleogiton fluitans*

Management

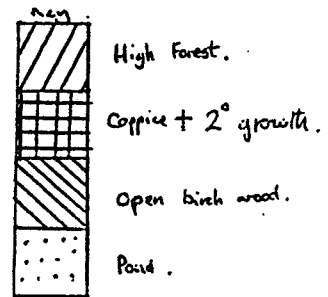
Oak high forest planted on site of old pasture woodland (part of Forest of Bere) ^{which was} ~~and~~ not enclosed until after 1870. Parts of the high forest have been felled and not replanted ^{2 or 3} now occupied by birch/Hazel coppice and oak regrowth.

Ci

Cc

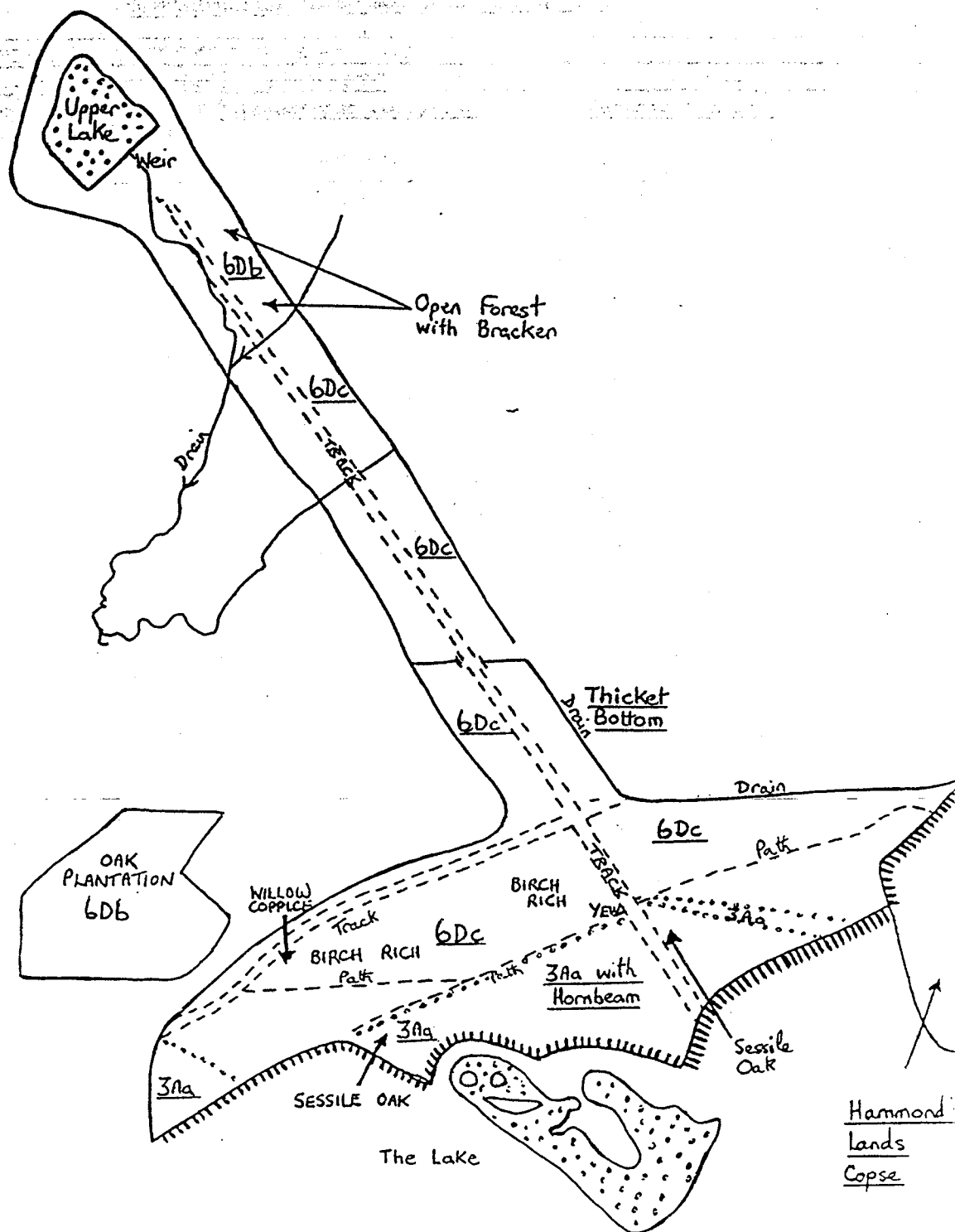
Ac

Structure map



100 m.

6Db
Path
OAK
PLANTATION



HAMPSHIRE: EXPECTED WOODLAND BIRD SPECIES

WEATHER : OVERCAST / SUNNY WITH SHOWERS

LOCATION : HAMMONDS LAND COPSE

DATE : 23 APRIL 8

R	<u>Accipiter niscus</u> 1 HUNTING ♂ SEEN	S	<u>Phylloscopus collybita</u> (R) 1 SINGING ♂	R	<u>Certhia familiaris</u>
R	<u>Buteo buteo</u>	R	<u>Regulus regulus</u> PRESENT	R	<u>Troglodytes troglodytes</u> THROUGHOUT
R	<u>Falco tinnunculus</u>	S	<u>Muscicapa striata</u>	R	<u>Fringilla coelebs</u> THROUGHOUT
R	<u>Phasianus colchicus</u>	R	<u>Erithacus rubecula</u> PRESENT	R	<u>Pyrrhula pyrrhula</u>
R	<u>Scolopax rusticola</u>	S	<u>Luscinia megarhynchos</u>	R	<u>Carduelis chloris</u>
R	<u>Columba palumbus</u> THROUGHOUT	R	<u>Turdus philomelos</u> PRESENT	R	<u>Acanthis flammea</u>
R	<u>Columba oenas</u> PRESENT	R	<u>Turdus merula</u> FREQUENT THROUGHOUT	R	<u>Sturnus vulgaris</u> PRESENT
S	<u>Streptopelia turtur</u>	R	<u>Turdus viscivorus</u> PRESENT	R	<u>Garrulus glandarius</u> PRESENT
S	<u>Cuculus canorus</u>	W	<u>Turdus iliacus</u>	R	<u>Pica pica</u>
R	<u>Strix aluco</u> 1 HUNTING ♂ HEARD	W	<u>Turdus pilaris</u>	R	<u>Corvus corone corone</u> PRESENT
R	<u>Picus viridis</u> 1 PAIR	R	<u>Aegithelos caudatus</u> 2 PAIRS	R	<u>Corvus monedula</u>
R	<u>Dendrocopus major</u> PRESENT	R	<u>Parus ater</u> PRESENT		ADDITIONAL SPECIES
R	<u>Dendrocopus minor</u> 1 ♂ SEEN	R	<u>Parus major</u> ABUNDANT		
R	<u>Prunella modularis</u> PRESENT	R	<u>Parus caeruleus</u> ABUNDANT		
S	<u>Sylvia borin</u>	R	<u>Parus palustris</u> 1 PAIR BUILDING A NEST		
S	<u>Sylvia atricapilla</u> (R) PRESENT	R	<u>Parus montanus</u>		
S	<u>Phylloscopus trochilus</u>	R	<u>Sitta europaea</u> 1 PAIR		

ANNEX 2

EXTRACT FROM HAT SURVEY REPORT

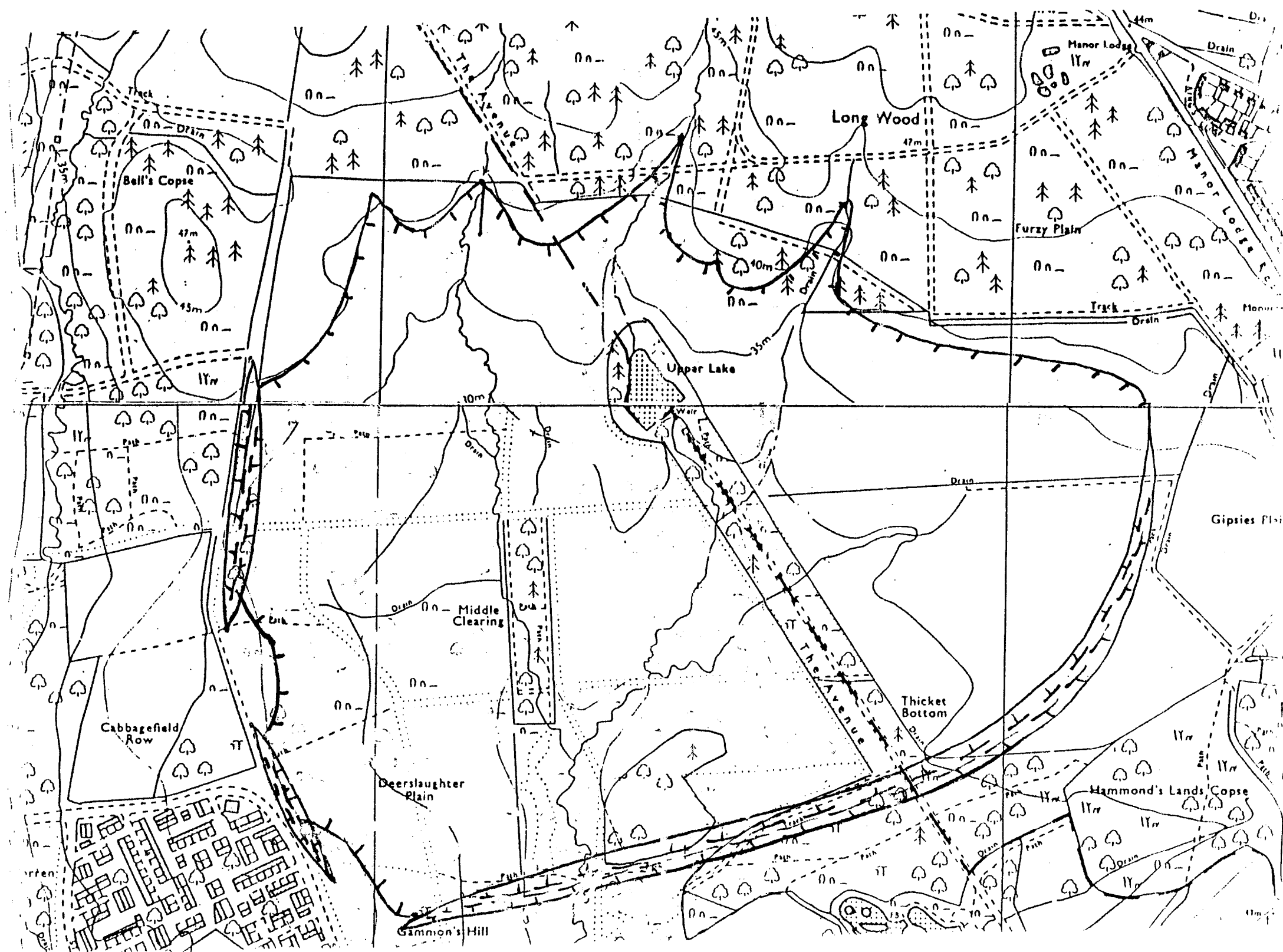
THE SIR GEORGE STAUNTON COUNTRY PARK :
ECOLOGICAL SURVEY

EMBER 1985 - JUNE 1986

TABLE 1

The Sir George Staunton Country Park: A Summary of Woodlands

Site (Grid Ref.)	Stand Types	Geology	Area (ha)	No Woodland Species	No MWP	Maps Older 1870	Woodland Management	Features of Interest
Bells Copse (SU 705 101)	3Aa, 6Dc, 7Ab, 7C	London Clay Reading Beds Typical Stag-nogley	25.25	116	39	1810 EV	✓ 1/3 is burnt out pine plantation. Remainder is regrowth from clear felling	Rich flora including one sessile oak, variety of stand types, woodland still coppiced
Cabbagefield Row (SU 707 095)	3Aa, Oak with grubbed coppice	London Clay Typical Stag-nogley	1.83	58	15	1810	Coppice with standards coppice grubbed out in central area. Area to N and S is neglected.	Ancient woodland adjoining once the pasture woodland of Havant Thicket. There is still a large bank marking this boundary.
Dunbury Hill (SU 705 096)	(s)6D, (s)3A (s)7	London Clay Typical Stag-nogley	7.45	73	20	X	X	Clearing flora is characteristically a meadow flora. Good example of secondary woodland.
Great Copse (SU 718 084)	9Ab, (s)3Aa	London Clay Typical Stag-nogley	5.0	87	29	1810 EW	✓ Over mature coppice but still retains coppice with standard structure.	Good example of hornbeam coppice with occasional hornbeam standards, rich flora.
Hammonds Land Copse (SU 723 094)	3Aa, 2Aa 6Dc	London Clay Typical Stag-nogley	14.0	80	32	1810	✓ Nature to over mature coppice with few standards, stands felled and not replanted.	Copse contains an old field with clearly defined boundaries, rich flora including one service tree.
Havant Thicket - Furry Plain (SU 723 103)	(s)3Aa, (s)12A	Reading Beds Typical Stag-nogley	6.4	50	11	X	X	Birch area - secondary birch on heath. S area neglected coppice, some conifers in NE.
Idsworth Common (SU 719 108)	6Db, 12A	Reading Beds Typical Stag-nogley	13.0	52	12	1810 PW Enclosed 1816	✓ Apart from past oak coppice, very little except motorcycle scrambling (illegal?)	A surviving part of disjunct Common originally as pasture woodland. Little subsequent management since enclosure.
Old Brickyard (SU 718 084)	(s)3Aa, (s)2Aa	London Clay Typical Stag-nogley	1.4	43	13	X	X	Neglected secondary woodland on old clay pit.
Thicket Bottom (SU 719 093)	3Aa, 6Db, 6Dc	London Clay Typical Stag-nogley	37.0	93	31	1810 PW Enclosed 1870	✓ Oak high forest planted on site of old pasture woodland (part of Forest of Bere)	<u>Hypericum elodes</u> present in pond at northern end, rich flora.
Wakeford Copse (SU 723 090)	6Dc, 3Aa, 11A	London Clay Typical Stag-nogley	2.6	69	23	✓ EW	✓ Neglected coppice with standards with the coppice grubbed out in the W.	
The Warren (SU 705 093)	(s)7A (s)3Ab	London Clay Typical Stag-nogley	5.5	78	19	X	X	Recent unmanaged secondary woodland.



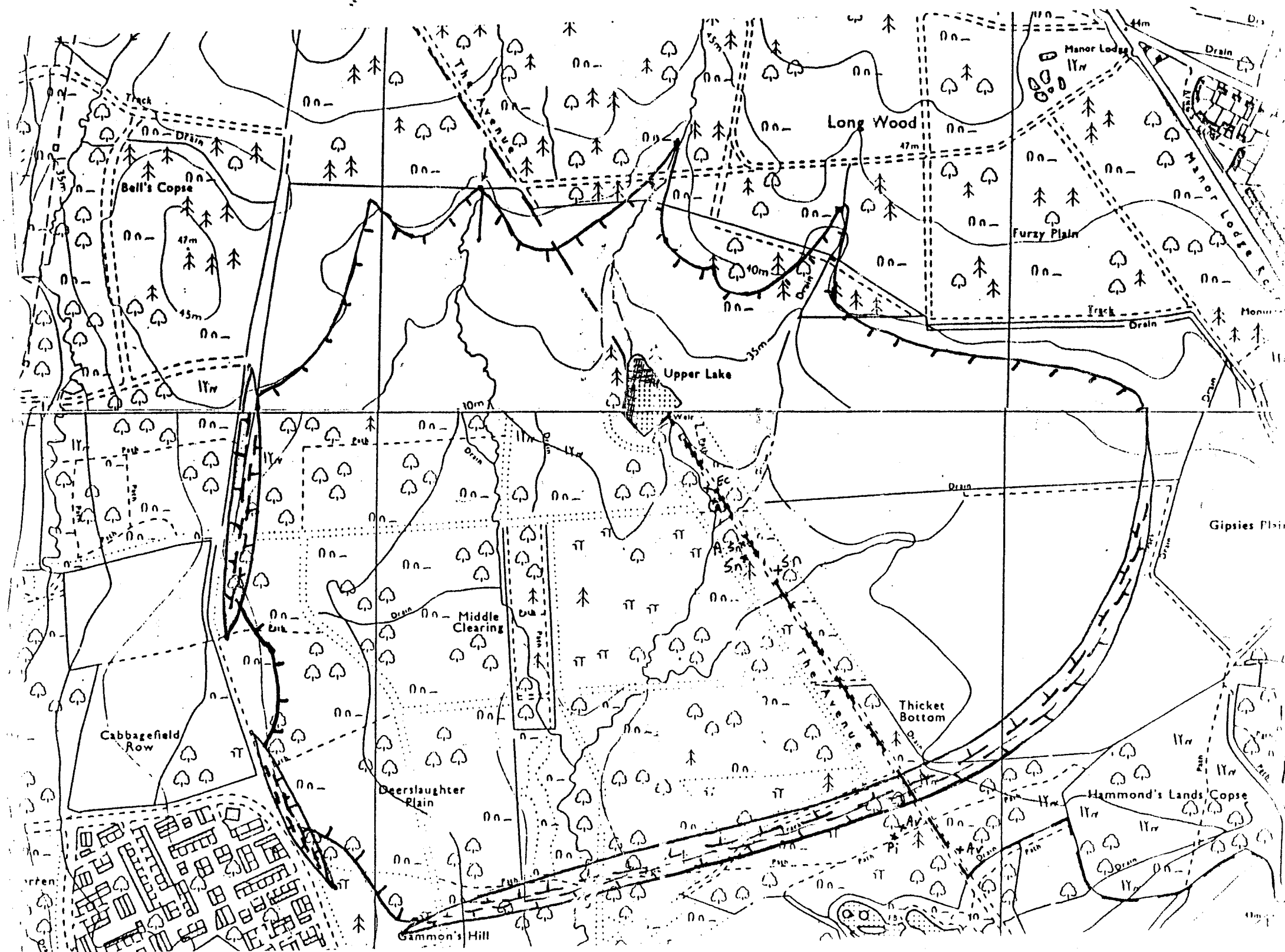


MAP 3 HAVANT THICKET

First Series 6" O. S. Map, Surveyed 1860's



Survey Results



Lichens:

Av = *Arthonia vinosa*

A = *Arthopyrenia ranunculospora*

Ec = *Enterographa crassa*

Pi = *Phaeographis inusta*

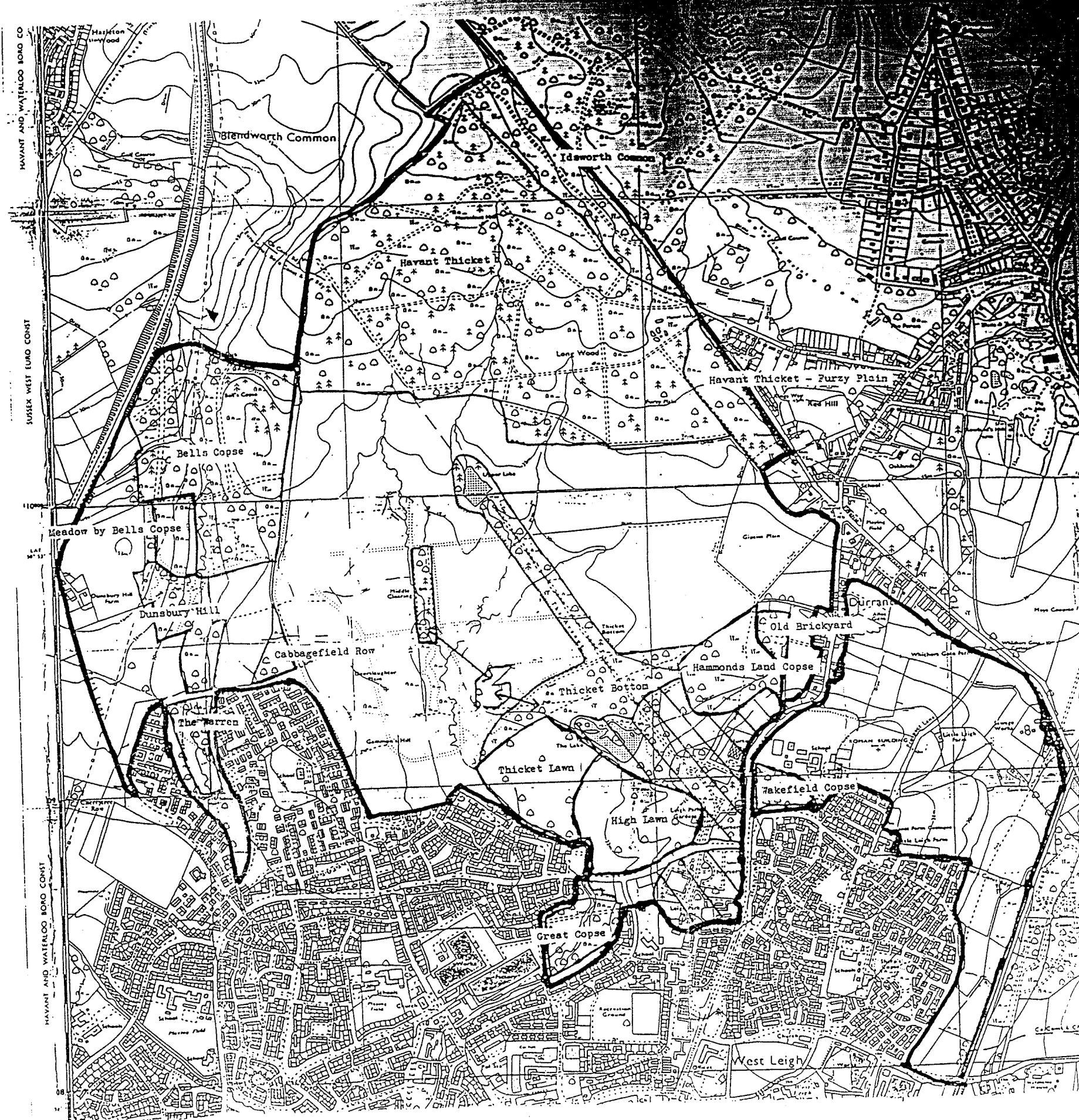
Sn = *Schismatomma niveum*

⊗ = *Hypericum elodes* & *Eleogiton fluitans*

Vascular Plants:

Surveyed

-  = Boundary of area examined
-  = Site surveyed
-  = Area of formal gardens, not examined



Atkins
The Hub
500 Park Avenue
Aztec West
Bristol
BS32 4RZ

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